DRAFT DECISION

TasNetworks
Transmission Determination
2019 to 2024

Attachment 5
Capital expenditure

September 2018

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: 1300 585 165
Email: AERInquiry@aer.gov.au

AER reference: 60153

Note

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

The draft decision includes the following attachments:

Overview

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 4 – Regulatory depreciation

Attachment 5 – Capital expenditure a

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 8 – Efficiency benefit sharing scheme

Attachment 9 – Capital expenditure sharing scheme

Attachment 10 – Service target performance incentive scheme

Attachment 11 – Pricing methodology

Attachment 12 – Pass through events

Contents

Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CCP13	Consumer Challenge Panel, sub panel 13
CESS	capital expenditure sharing scheme
CPI	consumer price index
DRP	debt risk premium
DMIAM	demand management innovation allowance (mechanism)
DMIS	demand management incentive scheme
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
F&A	framework and approach
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
opex	operating expenditure
PTRM	post-tax revenue model

Shortened form	Extended form
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
TNSP	transmission network service provider
TUoS	transmission use of system
WACC	weighted average cost of capital

5 Capital expenditure

Capital expenditure (capex) refers to the investment made in the transmission network to provide prescribed transmission services. This investment mostly 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 draft decision on TasNetworks' total transmission capex forecast. Further detailed analysis is provided in the following appendices:

- Appendix A - Assessment techniques
- Appendix B - Assessment of capex drivers
- Appendix C - Engagement and information-gathering process
- Appendix D - Demand
- Appendix E - Contingent projects
- Appendix F - Ex-post statement of efficiency and prudency.

Our draft decision is based on our analysis of the information we have received to date. We will be informed by TasNetworks' revised proposal, submissions and further analysis in arriving at our final decision in April 2019.

5.1 Draft 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 business' capex forecast if we are satisfied that the total forecast for the regulatory control period reasonably reflects the capex criteria.

These criteria outline that a business' 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.[2]

The capex objectives relate to a business' ability to comply with regulatory obligations and maintain the quality, reliability and security of supply of standard control services.[3]

Where a business 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

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1 NER, cl. 6A.5.4(a).
2 NER, cl. 6A.6.7(c).
3 NER, cl. 6A.6.7(a).

capex that we are satisfied reasonably reflects the capex criteria, taking into account the capex factors.[4]

TasNetworks has not justified that its total net capex forecast of $260.0 million reasonably reflects the capex criteria. Our substitute estimate of $222.6 million is 14 per cent below TasNetworks' forecast. We are satisfied that our substitute estimate reasonably reflects the capex criteria. Table 5.1 outlines our draft decision.

Table 5.1 Draft decision on TasNetworks' total forecast transmission capex ($2018–19, million, including overheads)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total
TasNetworks' proposal	39.3	64.3	65.6	47.7	43.1	260.0
AER draft decision	36.6	57.7	54.8	37.4	36.2	222.6
Difference	-2.7	-6.6	-10.8	-10.3	-7.0	-37.5
Percentage difference (%)	-6.9%	-10.3%	-16.5%	-21.7%	-16.2%	-14.4%

Source: AER analysis.

Note: Numbers may not add up due to rounding.

Table 5.2 summarises our findings and the reasons for our draft decision by 'capex driver' (e.g. augmentation, replacement and connections). This reflects the way we have assessed TasNetworks' total capex forecast.

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 arrive at a substitute estimate for total capex.

Our assessment highlighted some aspects of TasNetworks' proposal that reflect the capex criteria taking into account the capex objectives, such as augmentation and connections. However, we found that replacement expenditure is likely to be higher than a prudent and efficient level, and is therefore not likely to form part of a total capex forecast that reasonably reflects the capex criteria[5], taking into account the revenue and pricing principles.[6]

We test this total estimate of capex against the requirements of the NER (see section 5.3 for a detailed discussion). We are satisfied that our estimate represents a total capex forecast that as a whole reasonably reflects the capex criteria. As set out in appendix B, we are satisfied that our total capex forecast forms part of an overall

4 NER, cl. 6A.6.7(e).

5 NER, cl. 6A.6.7(c).

6 NEL, ss.7(a), 16(2).

transmission determination that will or is likely to achieve the National Electricity Objective to the greatest degree.

Table 5.2 Summary of AER reasons and findings

Issue	Reasons and findings
Total capex forecast	TasNetworks proposed a total capex forecast of $260.0 million ($2018-19, including overheads) in its proposal. TasNetworks has not justified that this forecast reasonably reflects the capex criteria. We are satisfied our substitute estimate of $222.6 million ($2018-19, including overheads) reasonably reflects the capex criteria. Our substitute estimate is 14 per cent lower than TasNetworks' initial proposal. The reasons for this decision are summarised in this table and detailed in section 5.4.
Forecasting methodology, key assumptions and past capex performance	We consider TasNetworks' investment governance processes are implemented inconsistently, and key assumptions and forecasting methodology lack sufficient quantification. In addition, the top-down 'optimisation' applied to the capex forecast appears arbitrary. We discuss where we have identified specific areas of concern in section 5.4 and in the appendices to this attachment.
Augmentation capex	We accept TasNetworks' forecast augex of $21.2 million ($2018-19, including overheads). TasNetworks has justified that its forecast augex forms part of a total capex forecast that reasonably reflects the capex criteria and is consistent with the drivers of expenditure in this category, including the expected continuation of flat or declining maximum demand in the forecast period. We expect that the RIT-T process for the George Town dynamic reactive support project will provide further transparency to stakeholders regarding the potential net benefits of this project. We provide further discussion in section B.2.
Customer connections capex	We accept TasNetworks' forecast customer connections capex of $3.0 million ($2018-19, including overheads). TasNetworks has justified that its forecast capex for the Sheffield substation connection point project is likely to provide reliability benefits to customers, is required to meet the capex objectives and is prudent and efficient. We provide further discussion in section B.3.
Replacement capex (repex)	We do not accept TasNetworks' repex forecast of $204.5 million ($2018-19, including overheads). We have included an amount of $167.0 million in our substitute estimate of total capex. We do not accept that TasNetworks' repex forecast is prudent and efficient and is the required expenditure for this driver. We consider that TasNetworks is able to defer a number of its proposed repex projects beyond the forecast regulatory control period. We provide further discussion in section B.4.

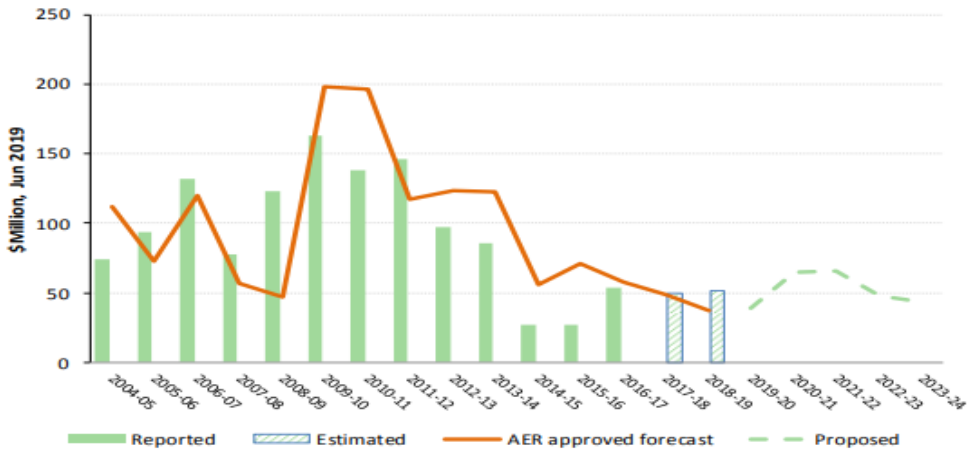
Non-network capex	We accept TasNetworks' forecast non-network capex of $31.9 million ($2018-19, including overheads). This includes capex for operational support systems, IT and communications and non-network other assets including fleet, land and buildings. TasNetworks has justified that its forecast non-network capex is consistent with the drivers of expenditure in these categories and would form part of a total capex forecast that reasonably reflects the capex criteria. We provide further discussion in section B.5.
Capitalised overheads	We have adjusted TasNetworks' forecast of capitalised overheads as a consequence of our adjustments to direct capex in each capex category, and in accordance with TasNetworks approved cost allocation methodology.
Contingent projects	We have not accepted TasNetworks' proposed contingent projects as contingent projects for the 2019–24 regulatory control period. We consider that TasNetworks should provide additional supporting information and amended project trigger events for all proposed contingent projects in its revised proposal to support the inclusion of these projects as contingent projects for the 2019–24 regulatory control period. This includes providing for satisfactory completion of the RIT-T as a mandatory trigger for all projects. We provide further discussion in appendix E.

Source: AER analysis.

5.2 TasNetworks' proposal

For the 2019–24 regulatory control period, TasNetworks' proposed total forecast net capex of $260.0 million ($2018-19). TasNetworks' 2019-24 capex forecast is $48.7 million (23 per cent) higher than its actual/expected capex of $211.3 million over the current 2014–19 period.

Figure 5.1 TasNetworks' historical vs forecast capex, including AER allowance ($2018-19)



Source: AER analysis.

The key drivers of TasNetworks' proposal are:

- Augmentation—$21.2 million (8.1 per cent)
- Connections—$3.0 million (1.2 per cent)
- Replacement—$204.5 million (78.5 per cent)
- Non-network—$31.9 million (12.2 per cent).

5.3 AER's assessment approach

In determining whether TasNetworks' proposal reasonably reflects the capex criteria, we use various qualitative and quantitative assessment techniques to assess the different elements of TasNetworks' proposal. Appendix B outlines how we came to our position and the weight we placed on some capex factors relative to others.

More broadly, we must take into account the revenue and pricing principles set out in the NEL.[7] 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 to:

- provide direct control network services; and
- comply with its regulatory obligations and requirements. [8]

When assessing capex forecasts, we also consider that:

- The capex criteria relating to a prudent operator and efficient costs are complementary. Prudent and efficient expenditure reflects the lowest long-term cost to consumers for the most appropriate investment activity required to achieve the expenditure objectives.
- Past expenditure was sufficient for the business to manage and operate its network in previous periods, in a manner that achieved the capex objectives.[9]

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' 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 business should or should not undertake.

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

8 NEL, s. 7A.

9 AER, *Better regulation: Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 9.

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.[10] Once the ex-ante allowance is established, businesses are incentivised to provide services at the lowest possible cost because their returns are determined by the actual costs of providing services. If businesses 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 business should have the flexibility to prioritise its capex program given its circumstances over the course of the regulatory control period. The business may need to undertake programs or projects that it did not anticipate during the distribution determination process. The business 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 business 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, when reviewing a capex forecast we use a combination of bottom-up and top-down assessment techniques. Assessment of the bottom-up build of forecasts including underlying assumptions is 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.

Thus, we also review the prudency and efficiency of aggregate expenditure areas or the total capex forecast.[11] Top-down analysis provides us with assurance that the entire expenditure program is prudent and efficient, and allows us to consider a business' 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 business' distribution determination, such as forecast opex and STPIS interactions.[12]

In the event we are not satisfied a business' proposed capex forecast reasonably reflects the capex criteria, we are required to determine a substitute estimate. We do

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

11 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.

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

so by applying our various assessment techniques. We then use our judgement to weight the results 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 business' capex forecast. Where our techniques involve the use of a consultant, their reports are considered when we form our draft decision position on total forecast capex.

Importantly, our decision on the total capex forecast does not limit a business' actual spending. We set the forecast at the level where the business has a reasonable opportunity to recover their efficient costs. As noted previously, a business 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 business does not bear the full cost where unexpected events lead to an overspend of the approved capex forecast. Rather, the business 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 business to pass on significant, unexpected capex to customers, where appropriate.[13]

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

5.3.2 Safety and reliability considerations

Our position in this draft 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 businesses to further improve the reliability of supply only where customers are willing to pay for these improvements.

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

5.3.3 Interrelationships

[13] NER, cl. 6A.6.9.

Consistent with our holistic approach, we take into account the various interrelationships between a business' total capex forecast and other components of its transmission determination, such as forecast opex, forecast demand, the Capital Expenditure Sharing Scheme (CESS) and STPIS interactions.

5.4 Reasons for draft decision

We applied the assessment approach set out in section 5.3 and appendix A to TasNetworks. In this draft decision, TasNetworks has not justified that its total capex forecast reasonably reflects the capex criteria. We outline how we have applied our assessment techniques and how we came to our position in appendix B. We are satisfied that our substitute estimate reasonably reflects the capex criteria.

As part of our assessment, we engaged engineering consultants, Arup, to undertake a detailed review of TasNetworks' total capex proposal. Overall, we agree with Arup's conclusion that TasNetworks has governance and risk management processes in place to identify risk, but there is a lack of risk quantification in the underlying cost-benefit analysis supporting its capex forecast.

Based on its review of TasNetworks' governance and risk management documents and processes, Arup concluded that "TasNetworks' risk identification appears to be a prudent approach, but the lack of quantifying risk consequences means that TasNetworks' approach to risk analysis is inadequate in fully understanding the impact of risks to the network".[14] Assessment of capex drivers outlines more detailed analysis drawing on Arup's assessment of TasNetworks' capex forecast.

In coming to our position, we have had constructive engagement with TasNetworks in the lead up to the draft determination. This includes several meetings, and informed and timely responses to our information requests. In this draft determination, we have noted particular areas of TasNetworks' capex proposal that were not well substantiated. We are encouraged from our most recent engagement with TasNetworks of its intention to work through these areas in preparing its revised proposal.

We recognise that our substitute estimate is substantially lower that what TasNetworks has proposed. It has been actively engaging with us in advance of this draft decision and we commend its efforts to understand and begin addressing our areas of concern well before its revised proposal.

Table 5.3 sets out the capex amounts by driver that we included in our substitute estimate of TasNetworks' total capex forecast for the 2019–24 regulatory control period.

[14] Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 24.

Table 5.3 Assessment of required capex by capex driver 2019–24 ($2018-19, million)

Category	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Augmentation	1.5	13.7	4.4	1.0	0.6	21.2
Connections	0.0	1.1	1.9	0.0	0.0	3.0
Replacement	28.2	34.4	42.0	31.1	31.3	167.0
Non-network	7.1	8.5	6.5	5.4	4.4	31.9
Modelling adjustments*	-0.2	0.0	0.1	-0.1	-0.2	-0.5
Total capex	**36.6**	**57.7**	**54.8**	**37.4**	**36.2**	**222.6**

Source: AER analysis.

Note: Numbers may not add up due to rounding.

* Modelling adjustments relate to 2017-18 CPI and labour cost escalator changes.

The reasons for our alternative capex forecast of $222.6 million are summarised below:

Augmentation

- TasNetworks has justified that its proposed augmentation capex of $21.2 million ($2018-19, including overheads) would form part of a total capex forecast that reasonably reflects the capex criteria.

Connections

- TasNetworks has justified that its proposed connections capex of $3.0 million ($2018-19, including overheads) would form part of a total capex forecast that reasonably reflects the capex criteria.

Replacement

- TasNetworks' proposed repex of $204.5 million ($2018-19, including overheads) does not appear to be a reasonable estimate of the prudent and efficient costs required for this capex category. TasNetworks has not justified that its repex forecast would form part of a total capex forecast that reasonably reflects the capex criteria. We have included an amount of $167.0 million ($2018-19, including overheads) in our substitute estimate of total capex. In coming to this position, we found that:
    - for two transmission line and seven switchgear replacements, TasNetworks made overly conservative assumptions about the risks and consequences of asset failures;
    - for four transformer replacement projects, recent asset condition reports suggest that a number of proposed asset replacements can be deferred beyond the forecast regulatory control period; and

- the top-down 'optimisation' applied by TasNetworks was arbitrary in nature and TasNetworks was unable to identify specific efficiencies in program delivery.

Non-network

- TasNetworks has justified that its proposed non-network capex of $31.9 million ($2018-19, including overheads) would form part of a total capex forecast that reasonably reflects the capex criteria. We have included our assessment of TasNetworks' operational support systems capex in this category.

Modelling adjustments

- We updated the 2017-18 CPI input in TasNetworks' capex model from forecast inflation to actual inflation. We also updated the forecast labour cost escalators in the model. These inputs are now consistent with the labour cost escalators in the opex attachment (attachment 6).

A Assessment techniques

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

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 Assessment Guideline (the Guideline).[15]

Below we outline the assessment techniques we used to assess TasNetworks' 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.[16] We also consider trends at the asset category level to inform our view on the prudency and efficiency of a business' capex forecast.

Trend analysis involves comparing a business' 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. In doing so, we consider the reasons the business provides in its initial 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 business to meet expected demand and comply with relevant regulatory obligations.[17] 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 demand will likely cause a reduction in the amount of capex the business 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 business should reassess project needs. Growth in a business' network will

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

16 NER, cl. 6A.6.7(e)(5).

17 NER, cl. 6A.6.7(a)(3).

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 impact 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 business' 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 and repex). 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 NSPs, 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 lives across a range of repex asset categories.

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

A.3 Assessment of bottom-up and top-down methodologies

In assessing whether TasNetworks' 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 can be used 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 proper 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[18], which relates to asset replacement planning, aims to assist network businesses with this bottom-up forecast. At the time of this draft decision, the draft industry practice application note is open for consultation. The final industry practice application note will be published in late November 2018. We therefore encourage TasNetworks to have regard to the final application note and the consultation process in its revised proposal.

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.

A.4 Economic benchmarking

Economic benchmarking is one of the key outputs of our annual benchmarking report.[19] The NER requires us to consider the annual benchmarking report, as it is one of the capex factors.[20] Economic benchmarking applies economic theory to measure the efficiency of a NSP's use of inputs to produce outputs, having regard to environmental factors.[21]

Economic benchmarking allows us to compare the performance of a business against its own past performance and the performance of other TNSPs. It also helps to assess whether a business' capex forecast represents efficient costs.[22]

> Benchmarking is a critical exercise in assessing the efficiency of an NSP.[23]

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18 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. Good asset management and risk management practices are often aligned with international standards of practice, such as ISO 55000 for asset management and ISO 31000 for risk management.

19 AER, *Annual benchmarking report: Electricity transmission network service providers*, December 2017.

20 NER, cl. 6A.6.7(e)(4).

21 AER, *Better regulation: Explanatory statement: Expenditure forecasting assessment guidelines*, November 2013, p. 78.

22 NER, cl. 6A.6.7(c).

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

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 business' efficiency with consideration given to its inputs, outputs and its operating environment.

We consider each business' operating environment, as there may be factors outside of a business' control that affects its ability to convert inputs into outputs.[24] Once these exogenous factors are taken into account, we expect TNSPs to operate at similar efficiency levels. One example of an exogenous factor we consider is customer density.

A.5 Other assessment factors

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

- safety and reliability statistics (SAIDI and SAIFI)
- internal technical and engineering review
- external consultant review
- submissions made by stakeholders, including consumer groups and customers; and
- other information provided by TasNetworks.

[24] AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, p. 113. Exogenous factors could include geographic factors, customer factors, network factors and jurisdictional factors.

B Assessment of capex drivers

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

As we discuss in the capex attachment, TasNetworks has not justified that its proposed total capex forecast reasonably reflects the capex criteria. In this appendix, we set out further analysis in support of this view. This further analysis also explains the basis for our substitute estimate of TasNetworks' capex forecast, which we are satisfied reasonably reflects the capex criteria. In coming to our views and our substitute estimate, we applied the assessed techniques outlined in appendix A.

This appendix sets out our findings and views on each capex category. 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.

In each of these sections, we explain why we are satisfied the amount of capex that we have included in our substitute estimate reasonably reflects the capex criteria.

B.1 Substitute estimate

Our substitute estimate of TasNetworks' total capex forecast for the 2019-24 regulatory control period is $222.6 million ($2018-19). After analysing TasNetworks' proposal, we formed a view on our substitute estimate of the capex required to reasonably reflect the capex criteria. Our substitute estimate is based on our assessment techniques, explained in section 5.3 and appendix A. Our weighting of each of these techniques is set out under the capex drivers in appendix B. We are satisfied that our substitute estimate reasonably reflects the capex criteria, taking into account the capex factors.

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' proposal

TasNetworks proposed augex of $21.2 million ($2018-19) for the 2019–24 regulatory control period. This is an increase from actual and estimated augex of $7.3 million for the 2014–19 period, but remains low compared to longer term historical levels of expenditure in this category.[25]

TasNetworks submitted that its forecast augex is not driven by demand growth, which remains flat. TasNetworks augex forecast is largely driven by a single project to install a new static var compensator (STATCOM) at the George Town substation. This project accounts for approximately $15.1 million or 71 per cent of TasNetworks' proposed augex. This project is subject to a RIT-T process in accordance with the NER.[26]

B.2.2 Position

TasNetworks has justified that its forecast augex of $21.2 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.

This conclusion reflects our assessment of the information available to us in making this draft decision. TasNetworks has now commenced the RIT-T for the George Town project, which will be well progressed when TasNetworks submits its revised proposal. All costs and benefits of this project will be assessed through this process, which will provide additional transparency to stakeholders, including evidence of the range of reasonable options assessed and the potential net economic benefits. We will consider any revised cost estimate or updated cost benefit analysis arising from the RIT-T process in our final decision on TasNetworks' forecast capex.

B.2.3 Reasons for our position

We have applied several assessment techniques to assess TasNetworks' proposed 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

[25] TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, p. 86.

[26] TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, p. 87.

- reviewed TasNetworks' expenditure forecasting methodology, including a review of key inputs and assumptions and the project documentation supporting TasNetworks' proposal.

We have also had regard to stakeholder submissions relating to forecast augex.

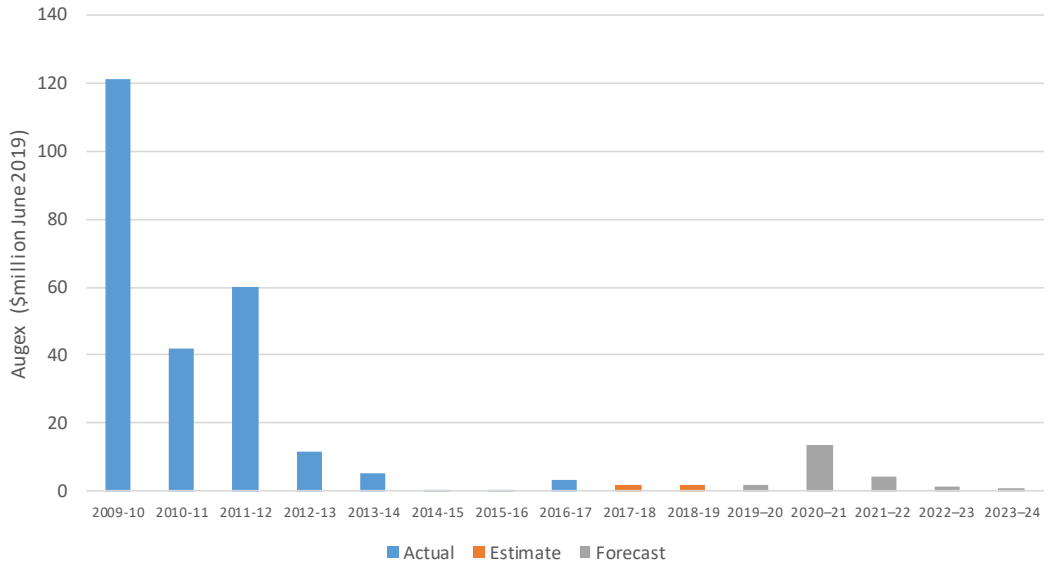
Trend analysis

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.[27]

Our use of trend analysis is to gauge how TasNetworks' actual augex compares to 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.[28]

Figure B.2.1 shows TasNetworks' actual and estimated augex since 2009-10 and its forecast augex for the 2019–24 regulatory control period. This shows a forecast augex remaining at historically low levels, but higher than the current regulatory control period in specific years due to the proposed George Town substation project.

Figure B.2.1 TasNetworks historical and forecast transmission augex ($2018-19)



Source: TasNetworks, *Revenue Proposal 2019/20-2023/24*, 31 January 2018, p. 86.

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

[28] AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 7–9.

We consider that our analysis of historical trends is useful in confirming that the underlying requirement for augex remains low 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, such as the George Town substation project. We have therefore undertaken a specific review of this project, as discussed below.

George Town substation augmentation project

TasNetworks identified the installation of the STATCOM device at the George Town substation as the key project of its proposed augex program. TasNetworks submitted that this project has multiple drivers, including the need to address voltage control issues for NER compliance, as well as market benefits associated with alleviating constraints that limit power flows on Basslink.[29]

George Town substation provides supply to major industrial customers and is the connection point for Basslink and the Tamar Valley Power Station. When Tamar Valley Power Station is not generating and Basslink is exporting from Tasmania, the significant load at George Town substation is supplied from remote generating units. TasNetworks submitted that this has presented a number of voltage control issues (i.e. NER compliance issues) including low fault level, post-contingency temporary over-voltage, voltage instability and voltage unbalance. TasNetworks identified that these issues have been addressed by constraining Basslink export capability or by operating some generating units in synchronous condenser mode, with the operational cost of this coming as a cost to the market. TasNetworks has forecast this issue to worsen in coming years with forecast load increases at George Town Substation and increasing non-synchronous generation (wind and solar) in the network.[30]

TasNetworks has identified a preferred option to install a ±50 MVAr 110 kV STATCOM at George Town Substation. TasNetworks considers this to be a technically and economically feasible option to address existing and forecast voltage unbalance and instability issues, with the unit size economically justified by the market benefits associated with reducing Basslink export constraints.[31] The cost of this project meets the threshold for the requirement to undertake a RIT-T process in accordance with the NER.

We sought further information from TasNetworks regarding the proposed George Town substation project.[32] TasNetworks provided the following information in response to our request:[33]

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29 TasNetworks, *Regulatory Proposal 2019–2024*, January 2018, p. 89.

30 TasNetworks, *IES - Dynamic Reactive Power Device for George Town Substation*, 1 November 2017, pp. 3-7.

31 TasNetworks, *Response to AER information request #017*, *Dynamic Reactive Power Device for George Town Substation: Investment Evaluation Summary (IES),* 14 May 2018.

32 AER, *Information request #017*, 4 May 2018.

33 TasNetworks, *Response to AER information request #017*, 14 May 2018.

- a project investment evaluation summary and NPV analysis[34]
- a more detailed project cost estimate breakdown providing details of relevant costs and benefits[35]; and
- a technical report on identified network issues and additional reactive support requirements at George Town Substation.[36]

The project investment evaluation summary assessed three options to overcome the issues identified by TasNetworks at George Town (continue current operating practices, install a ±25 MVAr STATCOM and install a ±50 MVAr STATCOM) and a range of sensitivities such as project timing, capital and operating costs, and discount rates. The cost estimate included a breakdown of relevant costs, while the technical report identified a number of George Town area network issues and included detailed engineering reactive support analysis and recommendations based on this analysis.

We also discussed this project in meetings with TasNetworks and our capex consultant Arup. Following these meetings, TasNetworks undertook to commence the RIT-T process for this project. TasNetworks expects that this process will be well progressed by the time it submits its revised proposal to us in December 2018.[37] We consider that this process will provide additional transparency to stakeholders around the need, drivers, costs and benefits of the project as well as opportunities for consumer engagement. This should assist stakeholders such as the Tasmanian Small Business Council (TSBC), which submitted that the main beneficiaries of the George Town project would be Hydro Tasmania, the Bell Bay aluminium smelter and Basslink and was concerned that the expected benefit to TasNetworks' broader customer base would be minimal.[38] The RIT-T process should provide transparency of the costs and benefits of this project to consumers

At this stage, based on the information currently available, we consider that the George Town STATCOM project appears likely to be justified by the need for regulatory compliance with voltage requirements, and by the benefits to market participants from alleviating the need for ancillary services resolving existing Basslink constraint issues. TasNetworks' initial economic analysis for the project suggests TasNetworks proposed option for the George Town substation (±50 MVAr STATCOM) is the highest NPV option identified, under a range of sensitivities. We have therefore made no adjustment to TasNetworks proposed augex in relation to the George Town project, which based on the information available, we are satisfied is prudent and efficient.

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[34] TasNetworks, *Dynamic Reactive Power Device for George Town Substation: Investment Evaluation Summary (IES),* 14 May 2018.

[35] TasNetworks, *George Town Dynamic Reactive Support - Economic Analysis (Confidential),* 14 May 2018.

[36] TasNetworks, *George Town Reactive Support Requirements,* 14 May 2018.

[37] TasNetworks, *Response to AER issues paper and stakeholder submissions*, 15 May 2018, p. 7.

[38] Tasmanian Small Business Council, *Submission on TasNetworks Transmission Revenue & Distribution Regulatory Proposal*, 16 May 2018, p. 37.

This conclusion reflects our assessment of the information available to us in making this draft decision. TasNetworks has now commenced the RIT-T for the George Town project, which will be well progressed when TasNetworks submits its revised proposal. All costs and benefits of this project will be assessed through this process, which will provide additional transparency to stakeholders, including evidence of the range of reasonable options assessed and the potential positive net economic benefits. We will consider any revised project cost estimate or updated cost benefit analysis arising from the RIT-T process in our final decision on TasNetworks' forecast capex.

B.3 Forecast connections capex

Connections capex relates to costs incurred in relation to the connection of new customers, or changes to existing connections. Generation connections are negotiated transmission services, and therefore outside the scope of this draft decision.

B.3.1 TasNetworks' proposal

TasNetworks proposed forecast connections capex of $3.0 million ($2018-19, including overheads). This forecast capex relates to a single project to establish an additional 22kV connection point at the Sheffield substation. TasNetworks submitted that this project is driven by:[39]

- benefits to customers from a reduction in the frequency and duration of outages on two Railton feeders; and
- compliance with network planning requirements.

B.3.2 Position

TasNetworks has justified that its forecast connections capex of $3.0 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 estimate of total forecast capex for the 2019–24 regulatory control period.

B.3.3 Reasons for our position

We assessed TasNetworks' forecast connections capex through a specific project review of the Sheffield substation connection point project. As part of this review, we sought additional evidence from TasNetworks to support the need, timing and costs of the project in the 2019–24 regulatory control period.[40]

TasNetworks provided the following documentation to support the proposed capex for the Sheffield substation connection point project:[41]

- investment evaluation summaries for both the distribution and transmission components of the project
- a project cost estimate
- a project economic analysis spreadsheet
- a project benefit analysis spreadsheet.

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39 TasNetworks, *IES - Sheffield substation connection point*, 9 June 2017, p. 3.

40 AER, *Information request #017*, 4 May 2018.

41 TasNetworks, *Response to AER information request #017*, 15 May 2018, p. 5.

Based on our review of the additional supporting documentation provided by TasNetworks, we are satisfied that the forecast capex for this project is prudent and efficient. We found that:

- the breakdown of costs for the project provided by TasNetworks appeared reasonable and did not include a project specific contingency
- TasNetworks had considered a reasonable range of options for the project[42]
- TasNetworks' preferred option for the project was the highest NPV option assessed[43]
- the project was likely to provide benefits to customers through reduced costs of unserved energy, under a relatively wide range of assumptions regarding the value of reliability to customers.

We have included TasNetworks' forecast of connections capex in our estimate of total forecast capex for the 2019–24 regulatory control period.

[42] TasNetworks, *IES - Sheffield substation connection point*, 9 June 2017, p. 6.

[43] TasNetworks, *IES - Sheffield substation connection point*, 9 June 2017, p. 7.

B.4 Forecast repex

Replacement capital expenditure (repex) must be set at a level that allows a business to meet the capex objectives. 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[44]
- 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 the network.

The majority of network assets will remain in efficient use for far longer than a single regulatory control period (many network assets have economic lives of 50 years or more). As a result, a business 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' proposal

TasNetworks has proposed forecast repex of $204.5 million ($2018-19, including overheads). In summary, TasNetworks has submitted that the key drivers of capex relating to the maintenance of network reliability and quality are:[45]

- safety and environmental performance and compliance requirements
- asset condition and risk
- asset performance
- technical obsolescence; and
- physical security.

B.4.2 Position

We do not accept TasNetworks' proposed repex of $204.5 million ($2018-19, including overheads). TasNetworks has not justified that its repex forecast is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. In coming to this position, we found that:

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[44] 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 an asset category wide perspective.

[45] TasNetworks, *Transmission and Distribution Regulatory Proposal*, January 2018, pp. 91–92.

- for two transmission line and seven switchgear replacements, TasNetworks made overly conservative assumptions about the risks and consequences of asset failures
- for four transformer replacement projects, recent asset condition reports suggest that a number of proposed asset replacements can be deferred beyond the forecast regulatory control period; and
- the top-down 'optimisation' applied by TasNetworks was arbitrary in nature and TasNetworks was unable to identify specific efficiencies in program delivery.

We have included an amount of $167.0 million ($2018-19, including overheads) in our substitute estimate of total capex. This represents an 18 per cent reduction, resulting from full or partial deferral of 13 proposed projects. We are satisfied that our substitute estimate of repex is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria, taking into account the capex factors.

B.4.3 Reasons for our position

We have applied several assessment techniques to assess TasNetworks' proposed repex forecast, as well as considering stakeholder submissions. These techniques include:

- trend analysis; and
- bottom-up and top-down considerations.

Trend analysis

Trend analysis of a business' past expenditure allows us to make general observations about how a business is performing. 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.[46]

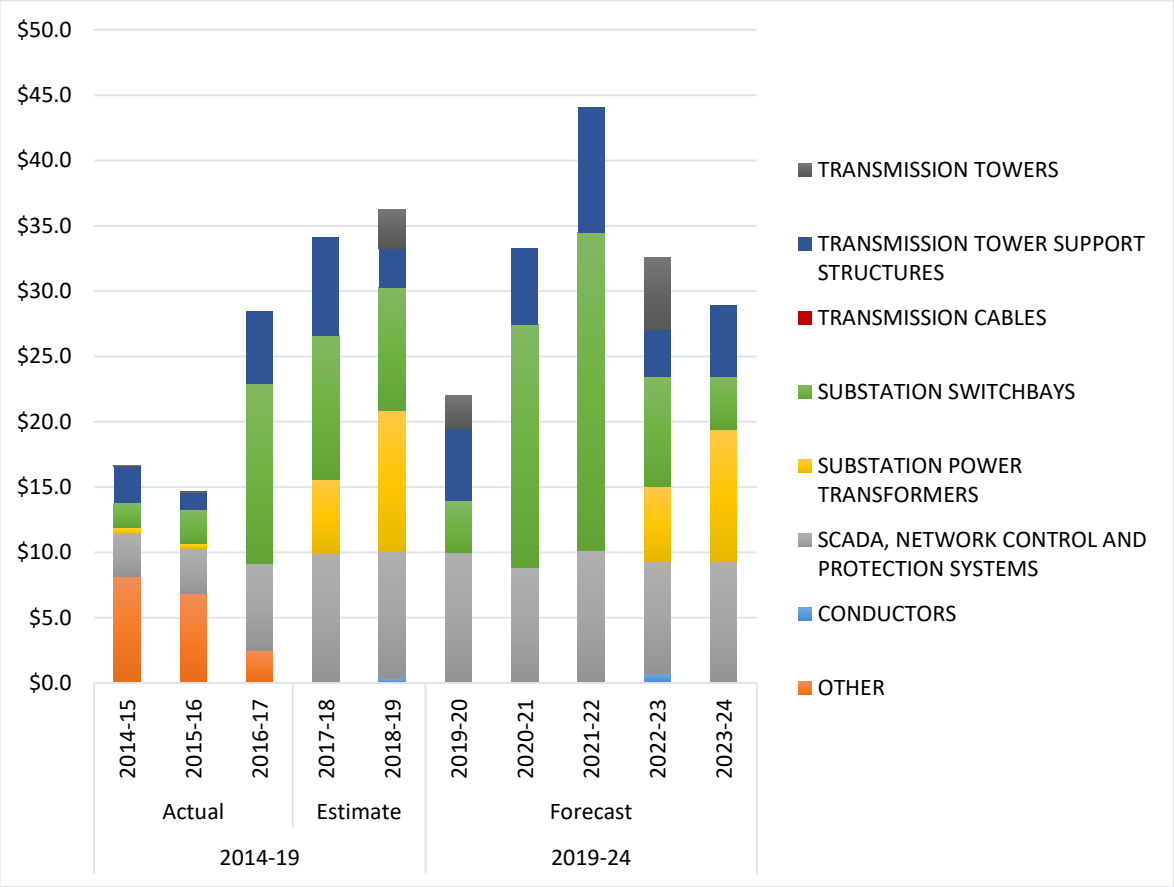
Where past expenditure was sufficient to achieve the capex objectives, this can be a reasonable indicator of whether an amount of forecast repex is prudent and efficient, and whether we would be satisfied this amount forms part of a total capex forecast that reasonably reflects the capex criteria.

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

- TasNetworks' proposed repex forecast for the 2019–24 regulatory control period relative to its actual and forecast spend in the current regulatory control period (Figure B.4.1); and
- historical vs forecast repex and replacement volume trends at both the asset group and asset category level.

[46] NER, cl. 6A.6.7(e)(5).

Figure B.4.1 TasNetworks' actual repex vs forecast repex ($2018-19, million, excluding overheads)



Source: AER analysis.

Figure B.4.1 highlights that TasNetworks' proposed repex for the forecast regulatory control period is 24 per cent ($30.7 million) greater than actual/expected repex in the 2014–19 regulatory control period, but 28 per cent ($63.6 million) less than actual capex in the 2009–14 regulatory control period. The Consumer Challenge Panel (CCP13) noted this trend in its submission.[47] The Tasmanian Small Business Council also submitted it "would expect to see a relatively stable level of repex in a mature network business, however that is not the case for TasNetworks, with expenditure varying from around $13 million in 2015-16 to over $50 million in 2021-22".[48]

Actual repex in the first three years of the current regulatory control period (2014-15 to 2016-17) was on average $19.9 million per year. TasNetworks has forecast an

[47] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, p. 5.

[48] Tasmanian Small Business Council, *TasNetworks transmission revenue and distribution– 2019-20 to 2023-24,* May 2018, p. 35.

average of $35.2 million per year for 2017-18 and 2018-19, which is broadly in line with the repex forecast for the 2019-24 regulatory control period.

The apparent variation in actual/expected transmission repex across the previous, current and forecast regulatory control periods demonstrates that this type of expenditure can be lumpy in nature, particularly relative to distribution repex. Therefore, we cannot solely rely on trend analysis to determine whether forecast repex is prudent and efficient.

Bottom-up and top-down considerations

TasNetworks noted in its proposal that its repex forecasts have been developed through a careful 'bottom-up' evaluation of investment requirements for each asset class, combined with a top-down discipline to optimise program synergies ensuring optimal timing of any proposed expenditure.[49] It submitted that the forecasts were derived and verified using:[50]

- asset specific condition assessment
- asset life and failure rate modelling as an input to the project options analysis
- reliability centred maintenance
- an analysis of risk, which adopts a systematic approach to assessing consequences and likelihood of asset failures or events; and
- benchmarking/validation.

We engaged Arup to undertake a technical engineering review of TasNetworks' forecast capex. The scope of Arup's review included an assessment of TasNetworks' governance framework, the reasonableness of the bottom-up forecast and the top-down constraints applied by TasNetworks in arriving at its final capex forecast.

Bottom-up considerations

TasNetworks' proposed repex is attributed to the following asset classes:

- Transmission lines ($50.5 million, including overheads)
- Transmission protection and control ($38.2 million, including overheads)
- Transmission substations ($95.5 million, including overheads)
- Transmission telecommunications ($20.2 million, including overheads).

We reviewed the portfolio of proposed transmission repex programs and projects, and undertook a detailed assessment of a sample of these programs and projects. This sample was based on several of the highest value programs and projects in

[49] TasNetworks, *Transmission and Distribution Regulatory Proposal*, January 2018, p. 92.
[50] TasNetworks, *Transmission and Distribution Regulatory Proposal*, January 2018, p. 92.

TasNetworks' repex proposal. The 13 programs and projects we assessed in detail account for 30 per cent of TasNetworks' total repex forecast.

TasNetworks' initial proposal did not include detailed information relating to the proposed repex. We requested, and TasNetworks provided, a number of investment evaluation summary (IES) documents and NPV analysis files it used to justify its proposed repex projects and programs.[51]

TasNetworks included assumptions on the value of customer reliability (VCR) in its IES and NPV analysis documents supporting its proposed repex programs and projects. In dollar terms, the VCR represents a customer's willingness to pay for the reliable supply of electricity, and can be used to determine whether the benefits of undertaking network investments (such as asset replacements) outweigh the costs.

Arup reviewed the IES and NPV analysis documents that TasNetworks provided. It noted that four major industrial users account for over 50 per cent of electricity consumption and TasNetworks should consider this in its analysis and VCR assumptions.

In the case of general investment in the transmission network, Arup recommends the use of the VCR for industrial users in metals, wood, pulp and paper, in conjunction with the VCR excluding direct connections (Table B.4.1).[52] Applying a weighted average VCR, as suggested by Arup, would result in a significantly lower VCR than the figure of $39.43 per kWh that TasNetworks used.

Table B.4.1 Weighted average VCR

Type	VCR	Weighting
TasNetworks' assumed VCR excluding direct customers in Tasmania ($/kWh)	39.43	50%
VCR industrial users - metals ($kWh)	5.29	25%
VCR industrial users - wood, pulp and paper ($/kWh)	1.44	25%
General transmission repex VCR ($/kWh)	**21.40**	**100%**

Source: TasNetworks' proposal and AER analysis.

CCP13's submission also noted the value in undertaking further sensitivity analysis with respect to VCR, and referred to AEMO's VCR Application Guide, which notes:

> Given the importance of the VCR in network planning, AEMO considers it prudent to undertake sensitivity analysis when conducting RIT-T and RIT-D

[51] AER, *Information requests 004 and 006 - capex,* March 2018.

[52] Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 28.

> assessments, to test how sensitive investment decisions are to the VCR input. Based on advice from academic advisors, a range of +/-30% VCR is considered reasonable for this purpose. Should the sensitivity analysis highlight that the investment decision changes depending on the VCR value used within that range, this would trigger further investigation of the VCR value to try to improve the accuracy. Depending on the situation, this may mean using a more detailed VCR value (such as a locational VCR, an outage-weighted VCR or a combination of both) or directly consulting with stakeholders to supplement the VCR with extra local knowledge.[53]

We consider that given the variability in the VCR figures in Table B.4.1, it would be prudent for TasNetworks to undertake a greater level of sensitivity analysis as part of its options analysis. CCP13 also noted that "replicating the analysis with alternative unserved energy figures changed the result", indicating that deferral until the subsequent regulatory control period was the preferred option.[54]

In addition, in forming our position on TasNetworks' proposed repex, we also had regard to other input assumptions that TasNetworks applied in its NPV analysis documents. In particular, we identified 13 programs and projects that we consider can be deferred (or partly deferred) beyond the forecast regulatory control period.

Our analysis indicates that TasNetworks has applied several very conservative assumptions in its underlying cost-benefit analysis. For example, TasNetworks assumes that when a switchboard fails, there is a 100% probability that it will fail in the peak demand month (July). TasNetworks then assumes that when a switchboard fails, there is a 100% probability that every day reaches peak demand for one hour.

In addition, our analysis indicates that TasNetworks' mean time to repair (MTTR)[55] assumptions are more likely to reflect the average replacement time, rather than the average repair time. Other TNSPs typically have much shorter MTTR assumptions for these assets. These assumptions compound together to produce overly conservative estimates for unserved energy.

This subsequently brings the optimal investment timing into the 2019–24 regulatory control period. However, using less conservative input assumptions in the underlying cost-benefit analysis pushes the optimal investment timing into the 2024–29 regulatory control period (or later) for several transmission repex programs and projects.

Table B.4.2 below outlines the 13 programs and projects where we consider TasNetworks has applied conservative underlying input assumptions. These programs and projects primarily relate to transmission line, switchgear and transformer replacements. Specifically, we note:

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53 CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, p. 36.

54 Ibid.

55 Mean time to repair represents the average time that a business takes to repair failed assets.

- for two transmission line and seven switchgear replacements, TasNetworks made overly conservative assumptions about the risks and consequences of asset failures; and
- for four transformer replacement projects, recent asset condition reports suggest that a number of proposed asset replacements can be deferred beyond the forecast regulatory control period.

Table B.4.2 Program and project list

Program/project	Asset group	Position
Boyer T13 & T14 supply transformers	Transformers	Deferral
Burnie supply transformers	Transformers	Partial deferral
Burnie-Waratah H pole replacement program	Poles	Partial deferral
Chapel Street 11kV HV switchgear	Switchgear	Deferral
George Town to Temco 110kV transmission line replacement	Transmission lines	Partial deferral
Knights Road 11kV HV switchgear	Switchgear	Deferral
Port Latta supply transformers	Transformers	Partial deferral
Railton 22kV HV switchgear	Switchgear	Partial deferral
Replace 110 kV ASEA HLD live tank breakers	Switchgear	Partial deferral
Replace 220 kV HPF live tank circuit breakers	Switchgear	Partial deferral
Sorell 22kV HV switchgear	Switchgear	Deferral
St Marys supply transformers	Transformers	Deferral
Ulverstone 22kV HV switchgear	Switchgear	Deferral

Source: AER analysis.

Our substitute estimate for repex of $167.0 million ($2018-19, including overheads) has been derived by adjusting TasNetworks' conservative input assumptions in the underlying cost-benefit analysis for the 13 programs and projects listed in table B.4.2. Our modelling and analysis results in partial or full deferral of the 13 programs and projects, as the optimal asset replacement timing moves from the 2019–24 regulatory control period to the 2024–29 period or later. We therefore assess that it would be prudent to partially or fully defer these programs and projects. Overall, we are satisfied that our substitute estimate of repex is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria, taking into account the capex factors.

Arup reviewed our underlying analysis of these 13 programs and projects. Arup's report "generally supports the methodology, comments and suggested expenditure presented by the AER".[56] Specifically, Arup noted that:

- NPV analysis key assumptions have not been appropriately justified – these include failure rates, recovery times, VCR, and failure modes. Justification of the values used would make TasNetworks' analysis more robust and transparent.
- There has been an inconsistent approach to the calculation of unserved energy in the NPV analyses. This is apparent in the Chapel St switchgear replacement project compared to other switchgear replacement projects. A transparent statement of, and a more uniform application of approach to unserved energy would assist the AER's review.
- In a number of instances, there is an incomplete or reduced set of options identified (e.g. Burnie – Waratah H Pole replacement program). Better identification of available options would better serve the customer preferences that TasNetworks has identified, in particular keeping the network costs low and at current reliability levels.[57]

Top-down considerations

In addition to a bottom-up review of several key programs and projects, we also engaged Arup to undertake a top-down assessment of TasNetworks' capex proposal. Overall, we agree with Arup's conclusion that TasNetworks has governance and risk management processes in place to identify risk, but there is a lack of risk quantification in the underlying cost-benefit analysis supporting its repex forecast.

After reviewing TasNetworks' governance and risk management documents and processes, Arup concluded that "TasNetworks' risk identification appears to be a prudent approach, but the lack of quantifying risk consequences means that TasNetworks' approach to risk analysis is inadequate in fully understanding the impact of risks to the network".[58] In addition, Arup identified that "TasNetworks employs qualitative risk assessment in its analysis" and "the risks are mapped to a risk matrix".[59]

Consistent with our previous decisions for other TNSPs, we would expect businesses to provide a properly constructed cost-benefit analysis that would typically identify and measure costs, benefits and risks. This includes the probability of an asset failing and the subsequent probability of this asset failure causing an incident or consequence. We also expect the cost of this incident or consequence to be quantified. This analysis

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56 Arup, *TasNetworks transmission repex addendum,* August 2018, p. 13.

57 Arup, *TasNetworks transmission repex addendum,* August 2018, p. 13.

58 Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 24.

59 Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 23.

ensures that the option that maximises net benefits is chosen from all different options or scenarios, including a business-as-usual or 'do-nothing' case.

In submitting its revised proposal, we encourage TasNetworks to review the lack of risk quantification in the underlying cost-benefit analysis supporting its repex forecast. Our recent engagement with TasNetworks indicates that its approach to risks is currently under review and it intends to quantify network risks in the future.[60]

Top-down optimisation

TasNetworks has 'optimised' its capex proposal by applying a 0.5 per cent ($5.7 million) top-down downwards adjustment to its transmission capex forecast. TasNetworks noted that this was in response to customer concerns regarding affordability.[61]

We asked TasNetworks how this efficiency was identified and how it will be achieved. In response, TasNetworks noted that its transmission capex forecast mainly consists of a small number of high-cost projects and therefore the opportunity to find efficiencies in program execution is limited.[62]

Arup concluded that TasNetworks is unable to identify how these savings will be delivered.[63] We agree with this conclusion, as TasNetworks was unable to identify efficiencies specific to a project or program. In addition, TasNetworks was not able to identify why the optimisation amount was 0.5 per cent instead of a higher or lower amount.

While we support TasNetworks' application of some form of 'optimisation' to its capex forecast, we agree with Arup's assessment that the top-down adjustment appeared to be arbitrary. We therefore cannot be satisfied that TasNetworks' forecast is prudent and efficient.

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60 Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 24.

61 TasNetworks, *Transmission and Distribution Regulatory Proposal*, January 2018, p. 11.

62 TasNetworks, *Response to information request 019*, 4 June 2018, p. 25.

63 Arup, *Review of TasNetworks' proposed capital expenditure for the 2019-24 regulatory control period,* August 2018, p. 14.

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 network operational support systems as part of this category.

B.5.1 TasNetworks' proposal

TasNetworks proposed total non-network capex of $31.9 million ($2018-19, including overheads) for the 2019–24 regulatory control period. This is a 35 per cent reduction from actual and estimated non-network capex for the five-year period 2014–19.[64] Non-network capex, including operational support systems, accounts for 12 per cent of TasNetworks' total forecast capex.

B.5.2 Position

TasNetworks has justified that its forecast non-network capex of $31.9 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 estimate of total forecast capex for the 2019–24 regulatory control period.

TasNetworks' forecast non-network capex is relatively low compared to historical levels of expenditure. This reflects a period of consolidation following some substantial investments in the previous five-year period, particularly in relation to ICT capex and operational support systems.[65] TasNetworks has justified that its forecast reflects the drivers of expenditure in this category, and the capex criteria.

B.5.3 Reasons for our position

We have applied several assessment techniques to assess TasNetworks' proposed non-network capex forecast against the capex criteria. In reaching our position, we:

- assessed trends comparing historical actual and forecast non-network capex for each category of expenditure
- reviewed TasNetworks' expenditure forecasting methodology, including a review of key inputs and assumptions and the project documentation supporting TasNetworks' proposal.

We did not receive any stakeholder submissions specifically relating to TasNetworks' forecast non-network other capex.

Trend analysis

[64] TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 85.

[65] TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, pp. 95–100.

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.[66]

Our use of trend analysis is to gauge how TasNetworks' actual non-network capex compares to forecast expenditure 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 non-network other capex is likely to be efficient and prudent, and therefore contributes to a forecast of total capex that reasonably reflects the capex criteria.[67]

Non-network ICT capex

TasNetworks proposed transmission ICT capex of $14.3 million for the 2019–24 regulatory control period, an average of $2.9 million per year. This is a 38 per cent reduction from the average annual transmission ICT capex of $4.6 million for the previous five-year period.[68]

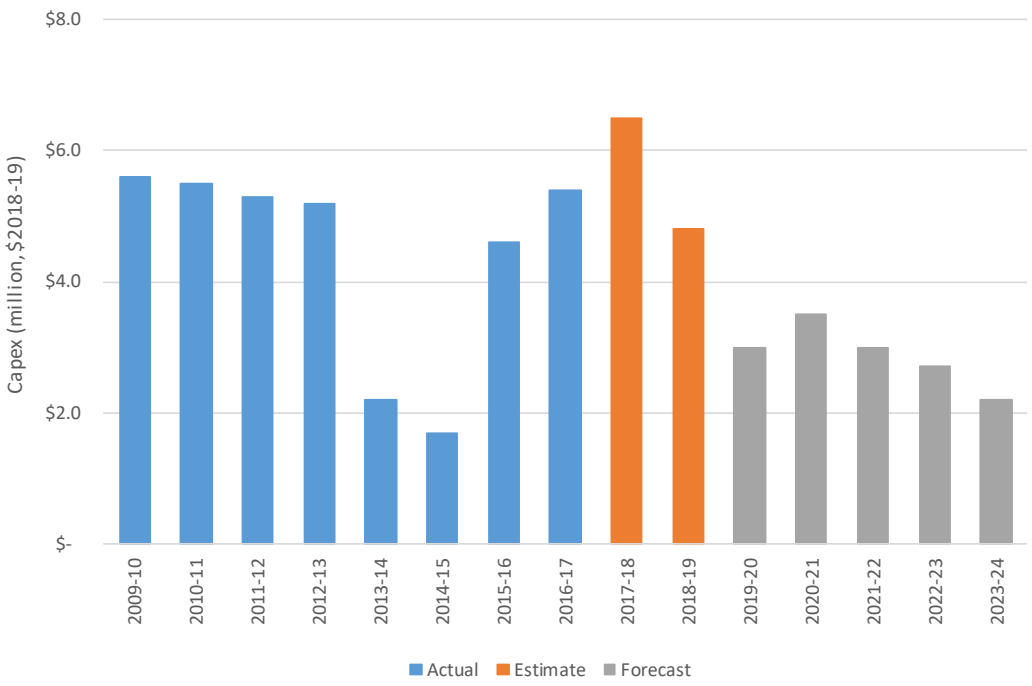
Figure B.5.1 shows TasNetworks' actual and estimated non-network ICT capex since 2012-13 and its forecast non-network ICT capex for the 2019–24 regulatory control period. This shows forecast non-network ICT capex declining to historically low levels over the 2019–24 regulatory control period.

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

67 AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 7–9.

68 TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 85.

Figure B.5.1 TasNetworks' historical and forecast ICT capex ($2018-19)



Source: TasNetworks, *Revenue Proposal 2019/20-2023/24*, 31 January 2018, p. 86.

We consider that historical trend analysis supports TasNetworks' non-network ICT capex proposal as being a prudent and efficient level of capex for this category. Expenditure in this category is forecast to decline and remain low compared to longer term historical levels of investment.

Our more detailed bottom up review of projects and programs within the ICT capex proposal has also not identified any particular areas of concern regarding the prudency and efficiency of the forecast capex for this category. TasNetworks has justified that its forecast capex for this category, while low compared to historical levels of expenditure, is a prudent and efficient level of expenditure that will allow TasNetworks to meet the capex objectives. We have therefore included TasNetworks' forecast non-network ICT capex in our estimate of total forecast capex for the 2019–24 regulatory control period.

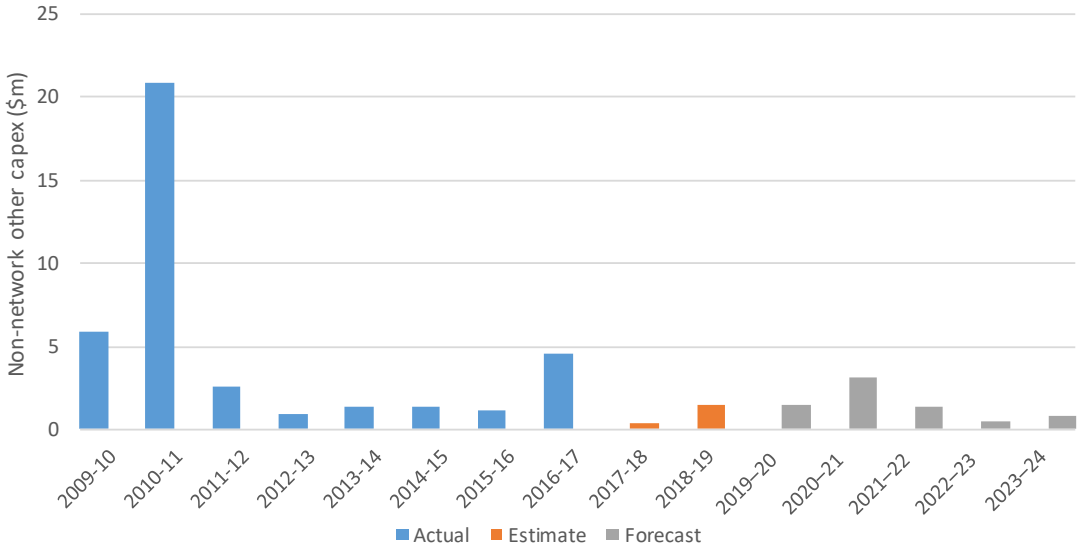
Non-network other capex

TasNetworks proposed non-network other capex of $7.3 million ($2018-19, including overheads) for the 2019–24 regulatory control period. This is a 19 per cent reduction compared to actual and estimated non-network other capex for the five year period 2014–19.[69]

[69] TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 85.

Figure B.5.2 shows TasNetworks' actual and estimated non-network other capex since 2009-10 and its forecast non-network other capex for the 2019–24 regulatory control period. This shows forecast non-network other capex generally in line with historically low levels of expenditure in this category over the 2019–24 regulatory control period.

Figure B.5.2 TasNetworks historical and forecast non-network other capex ($June 2019)



Source: TasNetworks, *Revenue Proposal 2019/20-2023/24*, March 2018, p. 86.

We consider that historical trend analysis supports TasNetworks' non-network other capex proposal as being a prudent and efficient level of capex for this category. Expenditure in this category is forecast to decline and remain relatively low compared to longer term historical levels of investment.

TasNetworks' non-network investment needs are determined in accordance with its asset management plans for these categories of assets. TasNetworks' vehicle fleet and facilities (land and buildings) are managed as shared services, with costs allocated directly to transmission or distribution functions where appropriate, following which they are allocated in accordance with TasNetworks' approved cost allocation method.[70]

Our review of TasNetworks forecasting methodology and the drivers of forecast capex in the different categories of non-network other capex found that:

- TasNetworks' Fleet Management Plan appears consistent with good management practices in respect to strategies and actions for the operation and maintenance of fleet assets. TasNetworks' Fleet Management Plan addresses a range of relevant considerations including: safety, fit for purpose, asset life cycle approach,

[70] TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 103.

monitoring performance, risk management and continuous improvement in asset management practices[71]

- the fleet replacement criteria applied by TasNetworks are similar to those of other Australian electricity network service providers[72]
- TasNetworks' facilities management plan appears to be consistent with good management practices in respect to the lifecycle management of TasNetworks' facilities assets[73]; and
- TasNetworks' facilities assets replacement criteria appear reasonable in respect to the assets' estimated life span and replacement options.[74]

On this basis, TasNetworks has justified that its forecast non-network other capex is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have included TasNetworks' forecast of non-network other capex in our estimate of total forecast capex for the 2019–24 regulatory control period.

Operational support systems capex

TasNetworks proposed operational support systems capex of $10.2 million for the 2019–24 regulatory control period, an average of $2.0 million per year. This is a 40 per cent reduction from the average annual operational support systems capex of $3.4 million for the previous five-year period.[75]

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.[76]

Figure B.5.3 shows TasNetworks' actual and estimated operational support systems capex since 2012-13 and its forecast capex for the 2019–24 regulatory control period. This shows forecast operational support systems capex declining to historically low levels over the 2019–24 regulatory control period, particularly in the network control systems sub-category.

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71 TasNetworks, *Tool of Trade Fleet Management Plan*, October 2017.

72 TasNetworks, *Tool of Trade Fleet Management Plan*, October 2017, p. 21.

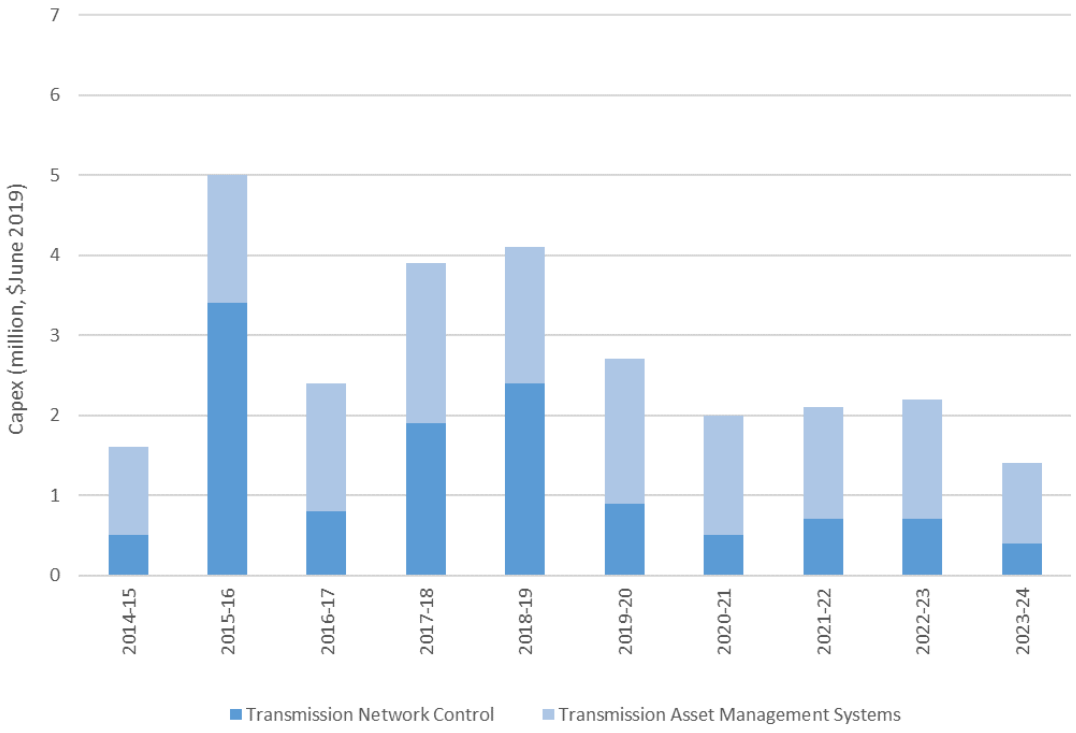
73 TasNetworks, *Facilities Asset Management Plan*, October 2017.

74 TasNetworks, *Facilities Asset Management Plan*, October 2017, p. 33.

75 TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 85.

76 TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, pp. 95–96.

Figure B.5.3 TasNetworks' historical and forecast operational support systems capex ($2018-19)



Source: TasNetworks, *Revenue Proposal 2019/20-2023/24*, 31 January 2018, p. 86.

We consider that historical trend analysis supports TasNetworks' operational support systems capex as likely to reflect a prudent and efficient level of capex for this category. Expenditure in this category is forecast to decline and remain low compared to historical levels of investment in this category.

Our more detailed bottom up review of projects and programs within the operational support systems proposal has not identified any particular areas of concern regarding the prudency and efficiency of the forecast capex for this category.

In term of asset management systems, TasNetworks has proposed capex related to asset knowledge management, asset planning, asset condition monitoring, asset risk management, network performance and asset data analytics and reporting. TasNetworks has proposed investment in these areas in order to minimise asset life cycle costs, and align with good asset management practices.[77] The network control capex supports TasNetworks' Networks Operations Control System, which is required

[77] TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, p. 97.

to ensure TasNetworks can operate and control the transmission system in accordance with its compliance obligations.[78]

We sought additional information from TasNetworks to demonstrate the need and economic justification for the proposed operational support systems expenditure.[79] TasNetworks advised that some of this expenditure is to develop data-analytic systems and tools in order to support continued improvements to overall asset management maturity. TasNetworks submitted that this will enable better access to higher quality data that will in turn result in efficiencies and optimisation within their network capital works program.[80]

TasNetworks also submitted that its asset management information system is composed of multiple systems that require further development or renewal within the 2019–2014 regulatory control period. The geographic information system is approaching end of life and requires modernisation, and other operational support systems such as the condition based risk management system, the vegetation management system and technical and engineering drawing systems are also scheduled for upgrade.[81]

Based on the information available, TasNetworks has justified that its forecast capex for this category is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have therefore included TasNetworks' forecast operational support systems capex in our estimate of total forecast capex for the 2019–24 regulatory control period.

78 TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, p. 95.

79 AER, *Information request #017*, 4 May 2018.

80 TasNetworks, *Response to AER information request #017*, 14 May 2018, p. 9.

81 TasNetworks, *Response to AER information request #017*, 14 May 2018, p. 9.

C Engagement and information-gathering process

Initial proposal

TasNetworks lodged its proposal on 31 January 2018, which included the primary documents that relate to capex for the 2019-24 regulatory control period. The initial proposal included the supporting documentation that typically accompanies a proposal. TasNetworks submitted several Investment Evaluation Summaries (IESs), but it did not submit all the IESs listed in its proposal. In addition, TasNetworks did not provide any underlying risk calculations and cost-benefit analysis.

Information-gathering process

During the review process, we requested further information relating to TasNetworks' capex proposal through several information requests. We sent five information requests relating to TasNetworks' transmission repex forecast. The questions aimed to test our understanding of the material provided and to clarify capex-related issues. TasNetworks responded to all five information requests and its responses were broadly on time.

Engagement

We have engaged with TasNetworks on numerous occasions throughout the review process. We met with TasNetworks staff via teleconference on 13 March 2018 to discuss AER information request 004, which sought to rectify several data issues and further information relating to transmission repex programs and projects. We also engaged with staff following the TasNetworks public forum in Hobart on 10 April 2018.

In addition, we met with staff during an on-site visit with our consultant, Arup, on 21 and 22 May. We asked a range of questions, including questions relating to TasNetworks' transmission repex forecast, during these meetings. Finally, we met with senior TasNetworks staff on 3 August 2018 to discuss our draft decision position.

D Demand

TasNetworks has utilised demand forecasts to help determine its forecast capex. We have reviewed TasNetworks' demand forecast in order to determine whether or not the proposed capex reasonably reflects a realistic expectation of forecast demand. Accurate, or at least unbiased, demand forecasts are important inputs to ensuring efficient levels of investment in the network.

System demand represents total demand in the TasNetworks transmission network. System demand trends give a high-level indication of the need for expenditure on the network to meet changes in demand. Forecasts of increasing system demand generally signal an increased network utilisation that may, once any spare capacity in the network is used up, lead to a requirement for augex. Conversely, forecasts of stagnant or falling system demand will generally signal falling network utilisation, a more limited requirement for augex, and the potential for the network to be rationalised in some locations.

D.1 TasNetworks' proposal

TasNetworks submitted that it had adopted the Australian Energy Market Operator (AEMO) 2017 connection point maximum demand forecasts for Tasmania to assess constraints and inform long-term development plans for its transmission networks.[82]

AEMO's connection point forecasts for Tasmania show no significant growth in maximum demand over the 2019-24 period, and overall are forecast to be flat, trending slightly upwards over the 20-year forecast period following an initial period of modest decline. TasNetworks submitted that, as a result, its augex forecasts are largely driven by non-demand related constraints, such as fault level and reliability, together with renewal strategy and rationalisation projects.[83]

D.2 Position

We consider that AEMO's connection point demand forecasts for Tasmania, which TasNetworks has adopted as its forecast of maximum demand for the 2019–24 regulatory control period, reflect a realistic expectation of forecast demand for TasNetworks' transmission network.

D.3 Reasons for our position

We consider that AEMO's Tasmanian connection point maximum demand forecast is based on a consistent and well-established forecasting methodology. AEMO produces transmission connection point demand forecasts for each jurisdiction in the NEM as part of its national transmission planner functions.

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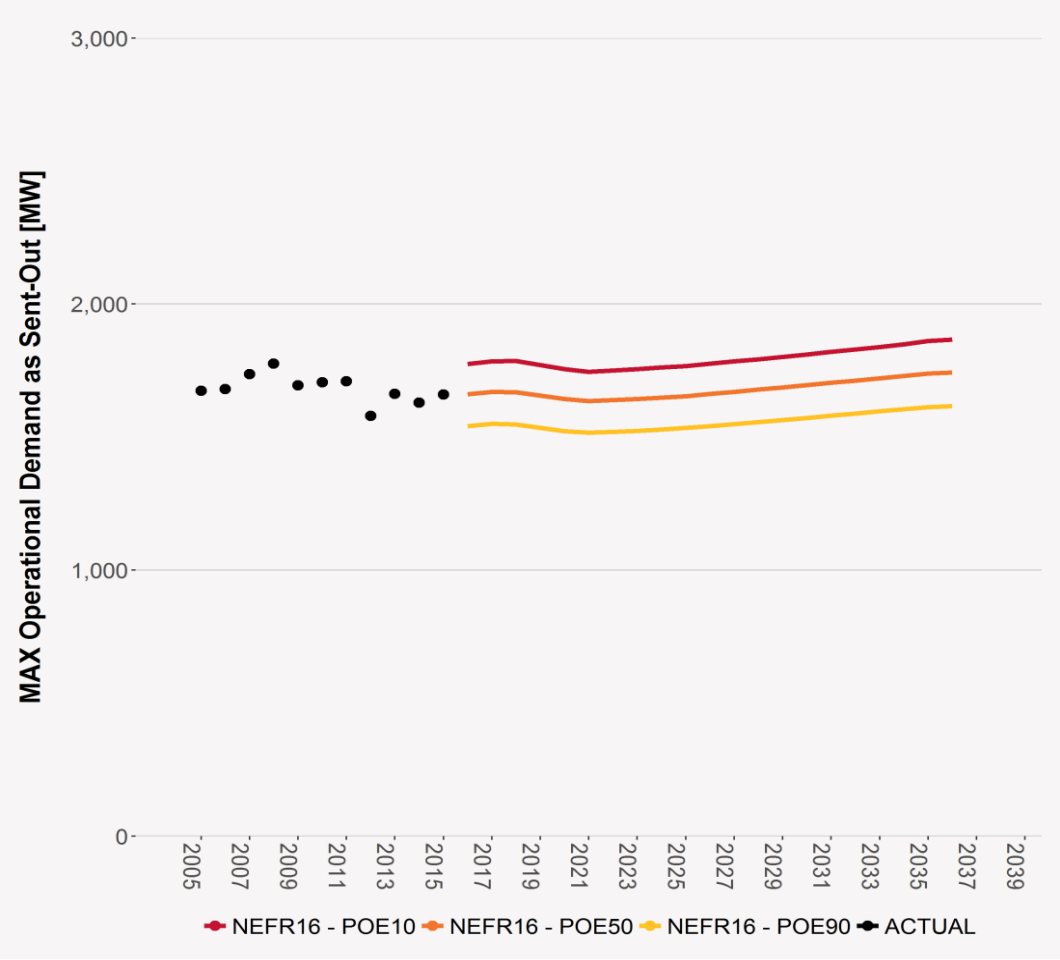
82 TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 69.

83 TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 69.

AEMO's independent forecast of actual and maximum demand in Tasmania is consistent with the long term underlying demand trend that occurred on TasNetworks' network historically. This trend showed flat or declining maximum demand in Tasmania, consistent with AEMO's demand forecasts for the 2019–24 regulatory control period. This is also consistent with the low levels of demand driven augex incurred by TasNetworks in the current regulatory control period and forecast by TasNetworks for the 2019–24 regulatory control period.

Figure D.3.1 shows that actual weather adjusted transmission connection point maximum demand in Tasmania grew from 2006 to 2008, but steadily declined for the next five years (from 2008 to 2012). The demand then increased after 2012, but has not returned to the level previously observed in 2008 and has shown little or no growth since then.

Figure D.3.1 Actual and Forecast Maximum Demand for Tasmania



Source: TasNetworks, *Regulatory Proposal 2019-2024*, 31 January 2018, p. 70.

We received submissions in relation to TasNetworks' forecast demand. CCP13 expressed concern that TasNetworks had not provided detailed analysis of its demand forecasts, and had relied on the 2016 AEMO National Electricity Forecasting Report

forecasts and historic substation diversity factors.[84] The Tasmanian Small Business Council observed that the transmission load and generation connection forecasts are opaque.[85]

We consider that AEMO's transmission connection point demand forecasts are likely to be unbiased, and are based on a consistent and well-established forecasting methodology. Details of AEMO's transmission connection point maximum demand forecasting methodology are available on AEMO's website, which provides some transparency to stakeholders regarding the forecasting methodology, inputs and assumptions applied in determining the demand forecasts.

While we are satisfied that AEMO's transmission connection point maximum demand forecasts are likely to reasonably reflect a realistic expectation of demand, AEMO has published updated transmission connection point maximum demand forecasts since TasNetworks submitted its initial proposal. We therefore expect that TasNetworks will utilise the latest available updated demand forecasts in developing its revised proposal.

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[84] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, 16 May 2018, p. 64.

[85] Tasmanian Small Business Council, *TasNetworks Transmission Revenue and Distribution Regulatory Proposal, 2019-20 to 2023-24 Submission*, May 2018, p. 20.

E Contingent projects

Contingent projects are typically significant network augmentation projects that may be reasonably required to be undertaken within the regulatory period in order to achieve the capex objectives. However, unlike other proposed capex projects, the need for the project and the associated costs are not sufficiently certain at the time the business submits its proposal. Consequently, expenditure for such projects does not form a part of our assessment of the total forecast capex that we approve in this draft determination. The cost of the projects may ultimately be recovered from customers in the future if certain predefined conditions (trigger events) are met.

E.1 TasNetworks' proposal

TasNetworks proposed five contingent projects for the 2019–24 regulatory control period with total estimated capital cost of $938 million.[86] TasNetworks submitted that each of the proposed projects would be required to meet or manage the expected demand for prescribed transmission services in accordance with clause 6A.6.7(a)(1) of the NER.[87]

Table E.1.1 below summarises the contingent projects proposed by TasNetworks for the 2019–24 regulatory control period. For each contingent project, the table sets out:

- the indicative contingent capex amount
- a brief description of the project purpose/scope
- whether the project triggers include a specific forecast of future committed customer/generator load in the relevant location; and
- whether the project triggers include the successful completion of a RIT-T process.

Table E.1.1 TasNetworks proposed contingent projects

Contingent Project	Contingent Capex	Brief Project Description	Load Trigger	RIT-T Trigger
Second Bass Strait Interconnector	$550 million	The Tasmanian component of a project to provide a second interconnection between Tasmania and Victoria.	N	N
Sheffield to Palmerston 220 kV Augmentation	$120 million	Reinforce the transmission network around Sheffield to enable connection of new renewable energy generation in North West Tasmania, or a second Bass Strait interconnector.	N	N

[86] TasNetworks, *Regulatory Proposal 2019–2024*, January 2018, pp. 106–109.

[87] TasNetworks, *Regulatory Proposal 2019–2024*, January 2018, p. 105.

Rationalisation of Upper Derwent 110 kV Network	$118 million	A project to rationalise the southern 110 kV circuits from Tungatinah to New Norfolk, which are approaching end of life.	N	N
North West 110 kV Network Redevelopment	$70 million	Reinforce the North West 110 kV network, to enable connection of new renewable energy generation in this region.	N	N
North West 220 kV Network Redevelopment.	$80 million	Reinforce the North West 220 kV network between Sheffield and Burnie, to enable connection of new renewable energy generation in this region.	N	N

Source: TasNetworks, *Revenue Proposal 2019/20-2023/24*, 31 January 2018, pp. 106–109; and AER analysis.

TasNetworks' proposed contingent project trigger events take the following form for all projects:[88]

> *1 (a) Successful completion of a RIT-T; or*
>
> *(b) A decision by a government or regulatory body that results in a requirement for the [project name].*
>
> *2. TasNetworks Board approval to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.*

TasNetworks' proposed trigger events for all five contingent projects make successful completion of the RIT-T optional. The alternative trigger is a decision by a government or regulatory body that results in an investment requirement.

E.2 Position

We find that that TasNetworks' proposed trigger events in relation to the five contingent projects are not appropriate as required by the NER.[89] Specifically, based on the information available, TasNetworks has not demonstrated that the proposed contingent project triggers are:

- reasonably specific and capable of objective verification;[90] and
- probable to occur during the regulatory control period.[91]

We have therefore determined that TasNetworks' proposed contingent projects are not suitable contingent projects for the 2019–24 regulatory control period.[92] TasNetworks should provide additional supporting information and amended project trigger events for all proposed contingent projects in its revised proposal to support the inclusion of these projects as contingent projects for the 2019–24 regulatory control period.

88 TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, pp. 106–109.
89 NER, cl. 6A.8.1(b)(4).
90 NER, cl. 6A.8.1 (c)(1).
91 NER, cl. 6A.8.1 (c)(5).
92 NER, cl. 6A.8.1 (b).

TasNetworks should continue to engage with consumers and other stakeholders to provide greater transparency around the drivers, scope, timing, benefits, funding options and indicative price impacts of these projects. The proposed contingent projects have the potential to add significantly to TasNetworks' RAB and consequently consumers' bills for many years to come. It is therefore critical that consumers are both sufficiently informed and have appropriate opportunities to engage throughout the investment approval process, including through this determination process and current and future RIT-T processes.

E.3 Reasons for our position

Assessment approach

The NER sets out the criteria we use in assessing proposed contingent projects.[93] That is, whether:

- the proposed contingent project is reasonably required to be undertaken in order to achieve any of the capex objectives[94]
- the proposed contingent capex is not otherwise provided for, in whole or in part, in the capex proposal[95]
- the proposed contingent project capex reasonably reflects the capex criteria, taking into account the capex factors, in the context of the proposed contingent project[96]
- the proposed contingent project capex exceeds the defined materiality threshold;[97] and
- the trigger events in relation to the proposed contingent project are appropriate.[98]

The detailed scope, timing and costs of contingent projects are uncertain. We are therefore often limited in our ability to assess these issues in detail at the revenue determination stage, depending on the level of information available. For some contingent project decisions, where businesses have provided sufficient supporting information, we have been able to undertake an assessment in some detail of how the projects relate to the achievement of the capex objectives, and whether the proposed contingent capex reasonably reflects the capex criteria. For TasNetworks' proposed contingent projects, we consider that TasNetworks' proposal would benefit from additional detailed information to assist us in assessing these aspects of the NER criteria for including contingent projects in a revenue determination. Based on our engagement with TasNetworks on its contingent project proposal, we anticipate that

94 NER, cl. 6A.8.1(b)(1).

95 NER, cl. 6A.8.1(b)(2)(i). A business must include forecast capex in its proposal which it considers is required in order to meet or manage expected demand for prescribed transmission services over the regulatory control period (see NER, cl. 6A.6.7(a)(1)).

96 NER, cl. 6A.8.1(b)(2)(ii).

97 NER, cl. 6A.8.1(b)(2)(iii).

98 NER, cl. 6A.8.1(b)(4).

TasNetworks' revised proposal is likely to include additional supporting information that will assist us to undertake this assessment in our final decision.

An important focus for this assessment is whether the trigger events for the proposed contingent projects are appropriate as defined by the NER. The definition of the trigger events associated with each project is important, as it is the occurrence of these events that determines if and when TasNetworks may apply to us to recover the efficient costs of undertaking the projects. In assessing whether the proposed trigger events are appropriate, the NER sets out that we have regard to the need for each trigger event to be:

- reasonably specific and capable of objective verification[99]
- a condition or event which, if it occurs, makes the project reasonably necessary in order to achieve any of the capex objectives[100]
- a condition or event that generates increased costs that relate to a specific location rather than a condition or event that affects the transmission network as a whole[101]
- described in such terms that it is all that is required for the revenue determination to be amended[102]; and
- probable to occur during the 2019–24 regulatory control period, but the inclusion of capex in relation to it (in the total forecast capex) is not appropriate because either:
    - the costs associated with the event are not sufficiently certain, or
    - there is not sufficient certainty that the event will occur during the regulatory control period, after the period, or not at all.[103]

We have made our assessment as to whether TasNetworks' proposed trigger events meet these requirements based on the information provided by TasNetworks in support of its proposal. We have also had regard to the significant number of submissions received from interested stakeholders on TasNetworks' proposed contingent projects, as summarised in Table E.3.1 below.

Submissions

Table E.3.1 Submissions on TasNetworks' contingent projects

Stakeholder	Issue
Consumer Challenge Panel (CCP 13)	CCP13 noted that substantive engagement with consumers on the potential impact of the projects on revenues, RAB and prices has only recently begun, following a strong negative response from consumers' post-lodgement of TasNetworks' proposal. CCP13 submitted that consumers have been justifiably concerned with the potential impact of

99 NER, cl. 6A.8.1(c)(1).
100 NER, cl. 6A.8.1(c)(2).
101 NER, cl. 6A.8.1(c)(3).
102 NER, cl. 6A.8.1(c)(4).
103 NER, cl. 6A.8.1(c)(5).

Stakeholder	Issue
	such significant expenditure and have raised questions about who pays and who benefits.[104] CCP13 recommended that:[105] • TasNetworks undertake comprehensive stakeholder engagement around the proposed contingent projects; and • the AER require the conduct of a RIT-T for all contingent projects. CCP13 also advised that based on its conversations with TasNetworks since lodgement of its proposal in February 2018, TasNetworks:[106] • will explore a number of different funding options – including impact on the RAB, merchant plant, and government contributions to funding – as part of the second interconnector feasibility study. • has decided to stand back and re-consider the planning assumptions for the second Basslink interconnector and associated projects. This will mean that the expenditure profile may change with some expenditure pushed out in timing. • will implement a more structured consultation process around informing consumers about how the contingent project and regulatory investment test process works and more information about the need, timing, costs and benefits. This will initially target TasNetworks' transmission customers, Customer Council and Pricing Reform Working Group members. CCP13 considered that it is particularly important that price path information consider the impact on the 2024–29 regulatory control period given the large proportion of capex spend likely in that period. CCP13 also considered that the implementation of the proposed contingent projects would have a substantial impact on increasing prices in the 2019–24 regulatory control period with further, additional increases in the 2024–29 regulatory control period.[107] CCP13 expressed a view that TasNetworks' proposed trigger of "a decision by government(s) or regulatory body that results in a requirement for the project" is not an adequate substitute for the markets benefit test (i.e. a test of the long-term interests of consumers) of the current RIT-T process.[108]
Tasmanian Small Business Council (TSBC)	The TSBC raised concerns that discussions related to contingent projects, in particular the second Bass Strait interconnector, are occurring without consumers being made aware of the implications for electricity prices. The TSBC estimated that the increase in network revenue from the second interconnector would translate to an annual cost burden in the order of $45 million per year and that the benefits would be largely invisible to consumers. The TSBC requested that information concerning the impact on prices should be made public and become part of the public discussion around the merits or otherwise of a second interconnector. The TSBC expects that the RIT-T process should identify the relevant beneficiaries and allocate costs accordingly.[109]

[104] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, pp. 39–44.

[105] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, 16 May 2018, p. 44.

[106] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, 16 May 2018, pp. 40–41.

[107] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, 16 May 2018, p. 43.

[108] Consumer Challenge Panel, CCP Sub-Panel No. 13, *Advice to the AER, Response to proposals from TasNetworks for a revenue reset for the 2019–24 regulatory period*, 16 May 2018, 16 May 2018, p. 44.

[109] Tasmanian Small Business Council, *TasNetworks Transmission Revenue and Distribution Regulatory Proposal, 2019-20 to 2023-24 Submission*, May 2018, pp. 37–40.

Stakeholder	Issue
Tasmanian Council of Social Service (TasCOSS)	TasCOSS raised concerns about the second Bass Strait interconnector due to its substantial cost and unclear benefit to Tasmanian energy consumers. TasCOSS considered that at this stage, too little is known about how a second interconnector might interact with Basslink, and the cost that would be borne by consumers if one or both interconnectors became stranded or partially stranded assets.[110]
Aurora Energy	Aurora Energy did not support the inclusion of contingent projects related to the second Bass Strait interconnector. Its view is based on the high uncertainty of the second interconnector project proceeding within the forthcoming regulatory period (if at all) and the need to more comprehensively consider whether the costs associated with these projects should be recovered from Tasmanian customers (if at all). Aurora Energy submitted that this is particularly important given that the driver, viability and funding model are yet to be established and will be predicated on providing renewable energy to benefit mainland customers as opposed to Tasmanian consumers.[111]
Tasmanian Renewable Energy Alliance (TREA)	TREA considered that the potential large increase in the RAB associated with the contingent projects would have a major and long-term impact on customer prices. The TREA encouraged the AER to ensure that any process for adding contingent projects to the TasNetworks transmission RAB:[112] • involves appropriate consultative processes that reflect the interests of the whole TasNetworks customer base • tests the cost benefit of the projects against a range of future scenarios for network development (including the likelihood of a greater role for distributed generation) • apportions the cost of these projects fairly taking into account the benefits to different groups (for example mainland versus Tasmanian consumers and customers on the distribution network versus those directly connected to the transmission network).
Anonymous	An anonymous submission considered that none of TasNetworks' trigger events were proper trigger events, noting that a decision by a government or regulatory body to oblige construction is more properly a regulatory change event trigger for a pass-through. In respect to the second Bass Strait interconnector contingent project, this submission considered that the jurisdiction of Tasmania did not extend more than three nautical miles from the Tasmanian coast, and therefore every part of the proposed second Bass Strait Interconnector that is more than three nautical miles from the Tasmanian coast cannot form part of the regulated network operated by TasNetworks.[113] In respect to the three contingent projects primarily to remove constraints for potential new generation in the north west of the state, the anonymous submission noted that it is not clear why the costs for the removal of constraints on generation should be borne by a party other than the generators. The anonymous submission also considered that the contingent project trigger events were not well specified.[114]
TasNetworks	TasNetworks submitted that it understands the concern of customers about the level of uncertainty about the scope, timing and cost of its proposed contingent projects, which also makes providing reasonable estimates of the possible revenue and pricing impacts difficult. TasNetworks stated that it would conduct a targeted engagement with

110 Tasmanian Council of Social Service, *Submission to the AER Issues Paper: TasNetworks Transmission and Distribution*, May 2018, pp. 5–6.

111 Aurora Energy, *Submission on TasNetworks' Distribution and Transmission Determination 2019-24*, May 2018, p. 4.

112 Tasmanian Renewable Energy Alliance, *Submission to the AER on the TasNetworks Distribution and Transmission Determination 2019 to 2024*, May 2018, p. 2.

113 Anonymous, *Submission to TasNetworks' regulatory proposal*, May 2018.

114 Anonymous, *Submission to TasNetworks' regulatory proposal*, May 2018.

Stakeholder	Issue
	stakeholders, customers and the community, and will be updating its assumptions and re-examining appropriate contingent project triggers as part of its revised proposal in November 2018.[115]

Source: AER analysis.

AER considerations

Our review of TasNetworks' proposal did not focus on the merits of individual projects, but rather on whether the information provided by TasNetworks and the form of trigger events proposed justified the inclusion of the projects as contingent projects for the 2019–24 regulatory control period in accordance with the requirements of the NER.

Based on the information available, we consider that the contingent capex for each of the five proposed contingent projects exceeds the defined materiality threshold requirement of the NER.[116] The contingent capex proposed for each project is significantly greater than the $30 million threshold, as shown in Table E.1.1. We are also satisfied given the nature of the projects that the proposed contingent capex is not otherwise provided for in TasNetworks' capex proposal.[117] We expect that TasNetworks' revised proposal will provide additional information to inform our assessment of whether each proposed contingent project meets the contingent project criteria under the NER, including that:

- it is reasonably required to be undertaken in order to achieve any of the capex objectives;[118]
- the proposed contingent project capex reasonably reflects the capex criteria in the context of the proposed contingent project;[119] and
- the trigger events are appropriate.[120]

In this draft decision, in relation to the contingent project triggers, based on the information TasNetworks has provided it is not clear that the contingent project triggers put forward by TasNetworks meet the NER requirements for these triggers to be:

- reasonably specific and capable of objective verification; and
- probable to occur during the regulatory control period.

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115 TasNetworks, *Response to the AER's Issues Paper: Transmission Revenue and Distribution Regulatory Proposal and Tariff Structure Statement*, May 2018, p. 9.

116 NER, cl. 6A.8.1(b)(2)(iii).

117 NER, cl. 6A.8.1(b)(2)(i). A business must include forecast capex in its proposal which it considers is required in order to meet or manage expected demand for prescribed transmission services over the regulatory control period (see NER, cl. 6A.6.7(a)(1)).

118 NER, cl. 6A.8.1(b)(1).

119 NER, cl. 6A.8.1(b)(2)(ii).

120 NER, cl. 6A.8.1(b)(4).

TasNetworks' contingent project triggers do not define the particular condition or event which is likely to trigger the need for a network investment, for example a specific change in committed load or generation capacity in a defined geographic location, or an identified need to address specific network constraints or undertake reliability corrective action. We therefore do not consider that TasNetworks' project triggers are 'reasonably specific and capable of objective verification' as required by the NER.[121] Our recent decisions on TransGrid and ElectraNet's proposed contingent projects provide a reasonable template for defining trigger events that we consider to be 'appropriate' in accordance with the NER. In these decisions, we typically allowed contingent projects with the following set of defined triggers that we consider collectively meet the NER requirements:[122]

1. a project specific trigger, which defines a particular condition or event that is likely to trigger the need for a network investment. Most commonly, this relates to a change in committed load or generation capacity in a defined geographic location, or the need to address specific network constraints.
2. a RIT-T trigger, requiring successful completion of a RIT-T process including an assessment of all credible options which demonstrates that a network investment is justified (i.e. maximises positive net economic benefits or is required for reliability corrective action).
3. a second RIT-T trigger, requiring a determination by the AER that the preferred investment option satisfies the RIT-T. TNSPs may seek such a determination from us for a RIT-T process where the need does not relate to reliability corrective action under clause 5.16.6 of the NER; but the inclusion of this trigger effectively mandates this step for contingent projects.
4. a business commitment trigger, which requires a commitment from the business Board to proceed with the project subject to us amending the business' revenue determination in accordance with the NER. This ensures, to the extent possible, that the business will actually proceed with the project once the revenue determination has been amended to provide for the additional revenue.
5. a qualifying clause that recognises that the two RIT-T related triggers described above do not apply if a change in the law occurs that allows the inclusion of the proposed investment in the TNSPs maximum allowed revenue even if a RIT-T is not carried out.

TasNetworks provided some information to support the need, scope and timing of the proposed contingent projects.[123] However, this information lacked detail and supporting evidence, and was not reflected in project specific triggers such that we could be satisfied that those triggers were reasonably specific and probable to occur in the

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121 NER, cl. 6A.8.1(c)(1).

122 AER, *Final decision TransGrid transmission determination - Attachment 6 - Capital expenditure*, May 2018, pp. 6-135 to 164 and *Final decision ElectraNet transmission determination - Attachment 6 - Capital expenditure*, April 2018, pp. 6-17 to 31.

123 TasNetworks, *Regulatory Proposal 2019–2024*, 31 January 2018, pp. 106–109.

2019–24 regulatory control period. TasNetworks' proposed contingent project triggers were generic across all proposed projects. TasNetworks' proposed project triggers also did not include successful completion of the RIT-T cost benefit analysis process as a necessary pre-condition of the projects proceeding, which was of concern to stakeholders and inconsistent with our recent decisions in this area.

The lack of supporting information on the forecast network constraints driving specific projects limits our ability to assess whether the project triggers are probable to occur in the 2019–24 regulatory control period.[124] In order to make this assessment, we would typically review details of current and forecast network capacity and asset condition, committed or likely load and generation capacities in geographic regions, and specific network constraints or reliability issues. Our overall assessment of TasNetworks' contingent project proposal is that it would benefit from additional detail, supporting evidence and analysis.

In relation to the timing of TasNetworks' proposed contingent projects within the 2019–24 regulatory control period, we note that in its modelling for the 2018 Integrated System Plan (ISP), AEMO has assumed the following indicative timing for relevant network upgrades:

- approximately 2033 for the second Bass Strait interconnector, dependent on project commitments and timing for the Snowy 2.0 and Battery of the Nation projects;[125]
- approximately 2035 for network augmentation to support a Renewable Energy Zone in North West Tasmania.[126]

We understand that the timeframes for specific investments identified in the ISP are indicative, based on AEMO's ISP modelling and assumptions. AEMO has stated that it is working with project proponents to refine the timing of the commissioning of projects such as the Battery of the Nation and associated transmission investments.[127] We anticipate that, in its revised proposal, TasNetworks will have regard to the ISP and will further explain and support its project timing assumptions in demonstrating that its proposed contingent project triggers are probable to occur in the 2019–24 regulatory control period.[128]

Our conclusions on TasNetworks' proposed contingent projects are consistent with submissions received from stakeholders. We received a number of submissions on TasNetworks' proposed contingent projects. The key points raised in these submissions are summarised in Table E.3.1. None of the submissions received supported TasNetworks' proposed contingent projects or project triggers. Common themes across the submissions focussed on:

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124 NER, cl. 6A.8.1(c)(5).

125 AEMO, *Integrated System Plan*, July 2018, p. 87.

126 AEMO, *Integrated System Plan*, July 2018, p. 60.

127 AEMO, *Integrated System Plan*, July 2018, p. 9.

128 NER, cl. 6A.8.1(c)(5).

- the impact on TasNetworks' RAB and consumer prices if the contingent projects proceed
- concerns around the funding model and perceived lack of benefits to Tasmanian consumers of the second Bass Strait interconnector and related projects
- the need for greater transparency and consultation with consumers around the projects
- the need for project triggers which ensure the projects do not proceed without a rigorous cost benefit analysis, including completion of the RIT-T as a mandatory project trigger.

The submissions received support our draft decision to not accept the proposed projects as contingent projects for the 2019–24 regulatory control period at this time. These submissions are consistent with our concerns regarding the nature of the contingent project triggers proposed by TasNetworks, and the lack of information available to support the probable need for the projects, including their scope and timing within the 2019–24 regulatory control period. These projects represent potential significant investments in network assets and addition to the RAB. If these projects proceed, the costs of these investments will be borne by consumers for many years to come. It is therefore critical that consumers are both sufficiently informed and have appropriate opportunities to engage with TasNetworks through the investment approval process, including through this determination process and current and future RIT-T processes.

TasNetworks' revised proposal

As stated above, following the submission of its initial proposal, TasNetworks has received strong feedback from customers and stakeholders that the proposed contingent projects are not supported at this time for inclusion in the 2019–24 regulatory control period and that additional information around the need, scope, timing, drivers, funding options, price impacts and benefits of these projects is required.

We acknowledge that, in response, TasNetworks has undertaken to conduct an engagement process with stakeholders, customers and the community around these projects. TasNetworks also advised that it will be updating its planning assumptions and re-examining the appropriate contingent triggers in relation to its proposed contingent projects with a view to submitting a revised proposal in November 2018.[129] We welcome TasNetworks' undertaking to refine its proposal, provide additional supporting information and further engage with stakeholders in the context of its revised proposal.

[129] TasNetworks, *Response to the AER's Issues Paper: Transmission Revenue and Distribution Regulatory Proposal and Tariff Structure Statement*, May 2018, p. 9.

F Ex-post statement of efficiency and prudency

We are required to provide a statement on whether the roll forward of the regulatory asset base from the previous period contributes to the achievement of the capital expenditure incentive objective.[130] The capital expenditure incentive objective is to ensure that where the regulatory asset base is subject to adjustment in accordance with the NER, only expenditure that reasonably reflects the capex criteria is included in any increase in value of the regulatory asset base.[131]

The NER requires that the last two years of the previous regulatory control period (for the purposes of this decision, the 2015–19 regulatory control period) are excluded from the ex-post assessment of past capex.[132] Accordingly, our ex-post assessment only applies to the 2015-16 and 2016-17 regulatory years.

We may exclude capex from being rolled into the RAB in three circumstances:[133]

1. Where the transmission business has spent more than its capex allowance
2. Where the transmission business has incurred capex that represents a margin paid by the transmission business, where the margin refers to arrangements that do not reflect arm's length terms; and
3. Where the transmission business' capex includes expenditure that should have been classified as opex as part of a transmission business ' capitalisation policy.

F.1 Position

We are satisfied that TasNetworks' capital expenditure in the 2015-16 and 2016-17 regulatory years should be rolled into the RAB.

F.2 AER approach

We have conducted our assessment of past capex consistent with the approach set out in our capital expenditure incentive guideline (the Guideline). In our Guideline, we outlined a two-stage process for undertaking an ex-post assessment of capital expenditure:[134]

- Stage one - initial consideration of actual capex performance
- Stage two - detailed assessment of drivers of capex and management and planning tools and practices.

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130 NER, cl. 6A.14.2(b).
131 NER, cl. 6A.5A(a).
132 NER, cll. S6A.2.2A(a), S6A.2.2A(a1).
133 NER, cl. S6A.2.2A(b).
134 AER, *Capital Expenditure Incentive Guideline*, November 2013, pp. 19–22.

The first stage considers whether the transmission business has overspent against its allowance and past capex performance. In accordance with our Guideline, we would only proceed to a more detailed assessment (stage two) if:

- a transmission business had overspent against its allowance
- the overspend was significant; and
- capex in the period of our ex-post assessment suggests that levels of capex may not be efficient or do not compare favourably to other transmission businesses.

F.3 AER assessment

We have reviewed TasNetworks' capex performance for the 2015-16 and 2016-17 regulatory years. This assessment has considered TasNetworks' out-turn capex relative to the regulatory allowance given the incentive properties of the regulatory regime for a transmission business to minimise costs.

TasNetworks incurred total capex below its forecast regulatory allowance in these regulatory years. Therefore, the overspending, requirement for an efficiency review of past capex is not satisfied.[135] We also consider that the 'margin' and capitalisation RAB adjustments are not satisfied. Relevantly, given the incentive based regulatory framework provides an incentive for a business to minimise costs and TasNetworks has underspent, we are satisfied that TasNetworks' expenditure was consistent with the capital expenditure incentive objective.

We have also had regard to some measures of input cost efficiency as published in our latest annual benchmarking report.[136] We recognise that there is no perfect benchmarking model, and we have been cautious in our initial application of these techniques for assessing the efficiency of expenditure in recent transmission determinations. Nonetheless, we consider that our benchmarking models are the most robust measures of economic efficiency available and we can use this measure to draw conclusions regarding a transmission business' efficiency over time. The results from our benchmarking report suggest that TasNetworks' overall efficiency declined in 2016, but improved in 2015. TasNetworks was the highest ranked business by multilateral total factor productivity score in 2016.

[135] NER, cl. S6.2.2A(c).

[136] AER, *Annual benchmarking report: Electricity transmission network service providers*, November 2017.