DRAFT DECISION
ElectraNet transmission determination
2018 to 2023

Attachment 6 – Capital expenditure

October 2017

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on ElectraNet's transmission determination for 2018–23. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 4 – Value of imputation credits

Attachment 5 – Regulatory depreciation

Attachment 6 – Capital expenditure

Attachment 7 – Operating expenditure

Attachment 8 – Corporate income tax

Attachment 9 – Efficiency benefit sharing scheme

Attachment 10 – Capital expenditure sharing scheme

Attachment 11 – Service target performance incentive scheme

Attachment 12 – Pricing methodology

Attachment 13 – Pass through events

Attachment 14 – Negotiated services

Overview

ElectraNet's forecast capital expenditure (capex) for the 2018–23 regulatory control period reflects the changing drivers of network investment in the context of a quickly evolving electricity market in South Australia.

ElectraNet has proposed a substantial decrease in capex for the 2018–23 regulatory control period of 39 per cent compared to estimated capex in the current period. This is largely driven by projections of declining demand in South Australia, which means there is currently no need to augment the network to meet expected demand.

The majority of ElectraNet's forecast capex relates to asset replacement and refurbishment work driven by the need to manage the safety, security and reliability risks associated with ageing assets. Following the system security and reliability issues experienced in South Australia over the last 12 months, ElectraNet has also proposed a small number of specific projects to improve the ability of the network to withstand extreme weather events and to maintain and enhance the security of the network.

For this draft decision, we are satisfied that ElectraNet's forecast capex is consistent with the drivers of investment need and reasonably reflects the efficient costs that a prudent operator would incur in the 2018–23 regulatory control period. In forming this view we have considered the information we have received from ElectraNet, and input from stakeholders, including the Consumer Challenge Panel. We have also taken into account the early and extensive process of consumer engagement undertaken by ElectraNet to ensure its revenue proposal adequately reflects the preferences of its customers.

Asset risk management framework

ElectraNet applies a risk based approach in its asset management decision making. This means that decisions to replace or refurbish network assets are made based on the risks associated with asset condition. ElectraNet's risk assessment framework considers the probability of asset failure, as well as the likelihood and cost of adverse consequences, to quantify a range of relevant risks including reliability, safety and environmental risks. Comparing the risk reduction benefits of investment against the costs of the proposed expenditure ensures that asset replacement decisions are made in an economic context.

For all large projects, ElectraNet conducts an economic assessment to determine whether the benefits of undertaking the project exceed the costs, considering all feasible options. This assessment also examines the optimal timing of the project to ensure that net benefits are maximised, and projects are deferred where this is more economic.

Based on our analysis, we are satisfied that ElectraNet's investment risk tool analysis used to inform the economic assessment of asset replacement and refurbishment decisions is consistent with good industry practice and generally reflects reasonable inputs and assumptions.

Contingent projects

ElectraNet proposed that five contingent projects be included in its revenue determination. Contingent projects are significant network augmentation projects that may arise during the regulatory control period but the need and or timing is uncertain. While the expenditures for such projects do not form a part of our assessment of the total forecast capital expenditure that we approve in this determination, the cost of the projects may ultimately recovered from customers in the future if certain conditions (trigger events) are met.

Three of ElectraNet's proposed contingent projects are for addressing current power system security and reliability issues as well as delivering non-load driven net market benefits. The remaining two projects are for reinforcing the relevant parts of ElectraNet's transmission network under specific load driven growth scenarios. ElectraNet has commenced a regulatory investment test for transmission (RIT-T) process for both the Eyre Peninsula Reinforcement and South Australian Energy Transformation projects. ElectraNet submitted that given the status of its proposed contingent projects, its cost estimates are indicative only and will continue to be refined as the various project options considered under each project are more fully evaluated through the RIT-T process. Our draft decision sets out minor amendments to the proposed project trigger events for us to accept these contingent projects.

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
CESS	capital expenditure sharing scheme
CPI	consumer price index
DMIA	demand management innovation allowance
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
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
NTSC	negotiated transmission service criteria
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice

Shortened form	Extended form
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

6 Capital expenditure

Capital expenditure (capex) refers to the capital expenses incurred in the provision of prescribed transmission services. This investment mostly relates to assets with long lives and these costs are recovered over several regulatory control periods. On an annual basis, the financing cost and depreciation associated with these assets (the return on and of capital) are recovered as part of the building blocks that form part of ElectraNet's total revenue requirement.[1]

6.1 Structure of the attachment

This attachment sets out our draft decision on ElectraNet's proposed total forecast capex for the 2018–23 regulatory control period. Further detailed analysis is in the following appendices:

- Appendix A - Assessment techniques
- Appendix B - Assessment of capex drivers
- Appendix C - Demand
- Appendix D - Contingent projects
- Appendix E - Ex post review – 2014–15 and 2015–16 capex.

6.2 Draft decision

We are satisfied that ElectraNet's proposed total forecast capex of $459.1 million ($2017–18) for the 2018–23 regulatory control period reasonably reflects the capex criteria. We have accepted ElectraNet's forecast capex, adjusted to reflect our estimate of forecast inflation of 2.5 per cent, as the total forecast capex for the 2018–23 regulatory control period. Table 6.1 sets out our draft decision in $2017-18 terms.

Table 6.1 Draft decision on ElectraNet's forecast capex ($2017–18, millions)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
ElectraNet's proposal	96.6	99.8	108.5	100.2	53.2	458.4
ElectraNet's proposal (CPI adjusted)[a]	96.8	99.9	108.7	100.4	53.3	459.1
AER draft decision	96.8	99.9	108.7	100.4	53.3	459.1

Source: ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis.

Note: [a] We have used our estimate of forecast inflation of 2.5 per cent, as determined in Attachment 3 of this draft decision, to express ElectraNet's forecast capex in real 2017–18 dollars.

[1] NER, cl. 6A.5.4(a).

ElectraNet's capex proposal consists of $383.8 million for non-load driven capex, $21.9 million for load driven capex, and $53.5 million for non-network capex.

A summary of our reasons and findings is set out in Table 6.2.

Table 6.2 Summary of AER reasons and findings

Issue	Reasons and findings
Total capex forecast	ElectraNet proposed a total capex forecast of $459.1 million ($2017–18). We are satisfied that this forecast reasonably reflects the capex criteria. We have therefore accepted ElectraNet's forecast as the total forecast capex for the 2018–23 regulatory control period. Based on our review of ElectraNet's proposal, we arrived at an alternative estimate of forecast capex of $452.8 million ($2017–18). This reflected our concern that ElectraNet's forecast connections expenditure for the Gawler East project may not reflect the efficient costs that a prudent operator would necessarily require to achieve the capex objectives in the 2017–23 regulatory control period. We compared our alternative estimate of total forecast capex with ElectraNet's forecast, including considering the reasons for the difference. ElectraNet's forecast total capex is one per cent higher than our alternative estimate of total forecast capex. We are satisfied that this is a reasonable margin of difference in the circumstances, such that ElectraNet's total forecast capex is likely to reasonably reflect the capex criteria. The reasons for this final decision are summarised in this table and detailed in the remainder of this attachment.
Forecasting methodology, key assumptions and past capex performance	We are satisfied that ElectraNet's forecasting methodology and key inputs and assumptions are consistent with good industry practice and likely to result in an estimate of total forecast capex which reasonably reflects the capex criteria. ElectraNet's capex forecasting methodology relies on a bottom-up approach to forecasting investment requirements in the 2018–23 regulatory control period. ElectraNet's forecasting methodology reflects a risk based economic planning approach which we consider to be consistent with current good industry practice. Decisions to replace or refurbish network assets are driven by asset condition, risk and reliability considerations balanced against cost through an economic assessment of available options. ElectraNet expects to underspend its allowed capex in the 2013–18 regulatory control period by approximately 6 per cent. ElectraNet's forecast capex is 39 per cent lower than actual and estimated capex in the 2013–18 regulatory control period.
Asset replacement and refurbishment capex	We accept ElectraNet's forecast asset replacement and refurbishment capex of $326.0 million ($2017–18) as a reasonable estimate of forecast capex requirements for this category. This is a reduction of 23 per cent from actual and estimated capex for this category in the 2013–18 regulatory control period. We consider that ElectraNet's forecast of non-load driven capex, including asset replacement and refurbishment capex, reasonably reflects the drivers of expenditure in this category. ElectraNet's forecasting methodology, including the investment risk tool analysis used to justify asset replacement and refurbishment decisions, is consistent with good industry practice and generally reflects reasonable inputs and assumptions.
Security and compliance	We accept ElectraNet's forecast of $46.3 million ($2017–18) for security and compliance non-load driven capex. This is a reduction of 40 per cent from actual and estimated capex for this category in the 2013–18 regulatory control period. We consider that ElectraNet's forecast of non-load driven capex, including security and compliance capex, reasonably reflects the drivers of expenditure in this category. The new projects proposed to address network security risks in the forecast period are economically justified in accordance with ElectraNet's standard forecasting methodology and reflect a measured approach to current system security risks.

Inventory and spares capex	We accept ElectraNet's forecast of $11.5 million ($2016–17) for inventory and spares capex. We consider that ElectraNet's forecast capex for inventory and spares is consistent with ElectraNet's obligation to respond to asset failures in accordance with the outage restoration times specified under the Electricity Transmission Code.
Load driven capex (augmentation and connection capex)	We are not satisfied that ElectraNet's forecast of $21.9 million for load driven capex reasonably reflects the capex criteria. We have included in our substitute estimate of total capex an amount of $15.6 million ($2017–18) for load-driven capex in the 2018–23 regulatory control period. This is $6.3 million or 29 per cent lower than ElectraNet's proposal. Our alternative estimate does not include the forecast connection capex related to the Gawler East connection point project which ElectraNet included in its forecast of non-load driven capex requirements. In our view, it is not clear that the forecast capex for this project reflects the efficient costs that a prudent operator would require to achieve the capex objectives in the 2018–23 regulatory control period. The anticipated demand growth driving the need for this expenditure is not captured by AEMO's connection point demand forecasts, and the project is subject to a future RIT-D process which will confirm the preferred economic option. As noted above, our conclusion on ElectraNet's forecast load-driven capex (a relatively minor category of total capex) has not changed our overall conclusion that ElectraNet's total forecast capex is likely to reasonably reflect the capex criteria.
Non-network capex	ElectraNet proposed $53.5 million ($2017–18) for non-network capex, including $47.5 million for ICT and $5.9 million for buildings and motor vehicles. This is a reduction of 22 per cent from actual and estimated capex for this category in the 2013–18 regulatory control period. We accept ElectraNet's forecast for non-network capex on the basis that this is consistent with historical levels of recurrent capex and therefore is likely to reasonably reflect the required expenditure for this category.
Contingent projects	ElectraNet proposed between $630 million to $950 million for five contingent projects. We accept ElectraNet's proposed contingent projects, subject to amendments to the trigger events proposed for these projects.
Cost escalators	We are satisfied ElectraNet's proposed real labour cost escalators which form part of its total forecast capex reflects a realistic expectation of the cost inputs required to achieve the capex objectives over the 2018–23 regulatory control period. ElectraNet's forecast methodology is generally consistent with our preferred approach in recent determinations, as discussed in Attachment 7 of this draft decision. ElectraNet has used estimated inflation of 1.97 per cent to represent its capex forecast in 2017-18 dollars. We substituted this estimate with our estimate of forecast inflation of 2.5 per cent, as discussed in Attachment 3 of this draft decision, to express ElectraNet's forecast total capex in 2017-18 dollars. ElectraNet has not proposed to apply real cost escalation for materials in its capex forecast. We have accepted this approach.

Source: AER analysis.

We consider that our decision on forecast capex takes into account the revenue and pricing principles. In particular, we consider our total capex forecast provides ElectraNet a reasonable opportunity to recover at least the efficient costs it incurs in:

- providing direct control network services, and
- complying with its regulatory obligations and requirements.

We are satisfied that our overall capex forecast is consistent with the national electricity objective (NEO). We consider our decision promotes efficient investment in,

and efficient operation and use of, electricity services for the long term interests of consumers of electricity.

We also consider that overall our total capex forecast, in satisfying the capital expenditure criteria, appropriately addresses the capital expenditure objectives. In making our draft decision, we specifically considered the impact our decision will have on the safety and reliability of ElectraNet's network. We consider this capex forecast should be sufficient for a prudent and efficient service provider in ElectraNet's circumstances to be able to maintain the safety, service quality, security and reliability of its network consistent with its current obligations.

6.3 ElectraNet's proposal

ElectraNet proposed total forecast capex of $459.1 million for the 2018–23 regulatory control period. This is $307.2 million or 40 per cent below ElectraNet's actual and estimated capex for the 2013–18 regulatory control period, and $515.0 million or 53 per cent less than ElectraNet's capex for the 2008–13 regulatory control period.[2] Based on this level of forecast capex, ElectraNet expects its RAB to reduce, in real terms, by 5 per cent during the 2018–23 regulatory control period.

6.4 Assessment approach

This section outlines our approach to capex assessments. It sets out the relevant legislative and rule requirements, and outlines our assessment techniques. It also explains how we derive an alternative estimate of total forecast capex against which we compare the service provider's total forecast capex. The information ElectraNet provided in its revenue proposal, including its response to our RIN, is an important part of our assessment. We have also taken into account information that ElectraNet provided in response to our information requests, and submissions from stakeholders.

Our assessment approach involves the following steps:

- Our starting point is the service provider's revenue proposal.[3] We apply our various assessment techniques, both qualitative and quantitative, to assess the different elements of the service provider's proposal. This analysis informs our view on whether the service provider's proposal reasonably reflects the capex criteria set out in the NER.[4] It also provides us with an alternative forecast that we consider reasonably reflects the criteria. In arriving at our alternative estimate, we weight the various techniques used in our assessment. We give more weight to techniques we consider are more robust in the particular circumstances of the assessment.

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2 ElectraNet, *ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, Capex 15 year View*, March 2017; AER analysis. This reflects ElectraNet's forecast capex in real 2017–18 dollars using an estimate of expected inflation of 2.5 per cent, as discussed in Attachment 3 of this draft decision.

3 AER, *Expenditure Forecast Electricity Transmission Guideline*, November 2013, p. 9; see also AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, pp. 111 and 112.

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

- Having established our alternative estimate of the total forecast capex, we can test the service provider's total forecast capex. This includes comparing our alternative estimate total with the service provider's total forecast capex and what the reasons for any differences are. If there is a difference between the two, we may need to exercise our judgement as to what is a reasonable margin of difference.

If we are satisfied that the service provider's proposal reasonably reflects the capex criteria in meeting the capex objectives, we accept it. The capital expenditure objectives (capex objectives) referred to in the capex criteria are to:[5]

- meet or manage the expected demand for prescribed transmission services over the period
- comply with all regulatory obligations or requirements associated with the provision of prescribed transmission services
- to the extent that there are no such obligations or requirements, maintain service quality, reliability and security of supply of prescribed transmission services and maintain the reliability and security of the transmission system, and
- maintain the safety of the transmission system through the supply of prescribed transmission services.

If we are not satisfied, the NER requires us to put in place a substitute estimate which we are satisfied reasonably reflects the capex criteria.[6] Where we have done this, our substitute estimate is based on our alternative estimate.

The capex criteria are:

- the efficient costs of achieving the capital expenditure objectives
- the costs that a prudent operator would require to achieve the capital expenditure objectives, and
- a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

The AEMC noted that '[t]hese criteria broadly reflect the NEO [National Electricity Objective]'.[7] Importantly, we approve a total capex forecast and not particular categories, projects or programs in the capex forecast. Our review of particular categories or projects informs our assessment of the total capex forecast. The AEMC stated:[8]

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

6 NER, cl. 6A.14.1(2)(ii).

7 AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 113 (AEMC Economic Regulation Final Rule Determination).

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

> It should be noted here that what the AER approves in this context is expenditure allowances, not projects.

In deciding whether we are satisfied that ElectraNet's proposed total forecast capex reasonably reflects the capex criteria, we have regard to the capex factors.[9] In taking these factors into account, the AEMC has noted that:[10]

> …this does not mean that every factor will be relevant to every aspect of every regulatory determination the AER makes. The AER may decide that certain factors are not relevant in certain cases once it has considered them.

Table 6.5 summarises how we took the capex factors into consideration.

More broadly, we note that in exercising our discretion, we take into account the revenue and pricing principles set out in the NEL.[11] In particular, we take into account whether our overall capex forecast provides ElectraNet a reasonable opportunity to recover at least the efficient costs it incurs in:

- providing direct control network services, and
- complying with its regulatory obligations and requirements.[12]

Expenditure Forecast Assessment Guideline

We published our Expenditure Forecast Assessment Guideline for electricity transmission (Guideline) in November 2013.[13] The Guideline sets out our proposed general approach to assessing capex (and opex) forecasts. This assists in providing transparency and predictability in regulatory processes and outcomes. We also set out our approach to assessing capex in our framework and approach paper. For ElectraNet, we stated that we would apply the Guideline, including the assessment techniques outlined in it. However, we stated that we would exercise our judgement in determining the extent to which we use a particular technique as set out in the Guideline. We may depart from our Guideline approach and if we do so, we need to provide reasons. In this draft decision, we have not departed from the approach set out in our Guideline.

We note that the RIN data form part of a service provider's revenue proposal.[14] In our Guideline we stated we would "require all the data that facilitate the application of our assessment approach and assessment techniques". We also stated that the RIN we issued in advance of a service provider lodging its revenue proposal would specify the

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

10 AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, p. 115.

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

12 NEL, s. 7A.

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

14 NER, cl. 6A.10.1(c).

exact information we require.[15] Our Guideline made clear our intention to rely upon RIN data in transmission revenue determinations.

6.4.1 Building an alternative estimate of total forecast capex

The following section sets out the approach we apply to arrive at an alternative estimate of total forecast capex.

Our starting point for building an alternative estimate is ElectraNet's proposal.[16] We review the proposed forecast methodology and the key assumptions that underlie the forecast. We also consider its performance in the previous regulatory control period to inform our alternative estimate.

We then apply our specific assessment techniques to develop an estimate and assess the economic justifications that ElectraNet put forward. Many of our techniques encompass having regard to the capex factors. Appendix A and appendix B contain further details on each of these techniques.

Some of these techniques focus on total capex; others focus on high level, standardised sub-categories of capex. Importantly, while we may consider certain projects and programs in forming a view on the total capex forecast, we do not determine which projects or programs the service provider should or should not undertake. This is consistent with the regulatory framework and the AEMC's statement that the AER does not approve specific projects. Rather, we approve an overall revenue requirement that includes an assessment of what we find to be an efficient total capex forecast.[17]

We determine total revenue by reference to our analysis of the proposed capex and the various building blocks. Once we approve total revenue, the service provider is able to prioritise its capex program given its circumstances over the course of the regulatory control period. ElectraNet may need to undertake projects or programs it did not anticipate in its revenue proposal. ElectraNet may also not require some of the projects or programs it proposed for the regulatory control period. We consider a prudent and efficient service provider would consider the changing environment throughout the regulatory control period in its decision-making.

As we explained in our Guideline:[18]

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15 AER, *Better regulation: Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 25.

16 AER, *Better regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, p. 7; and AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, pp. 111 and 112.

17 AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. vii.

18 AER, *Better regulation: Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 12.

> Our assessment techniques may complement each other in terms of the information they provide. This holistic approach gives us the ability to use all of these techniques, and refine them over time. The extent to which we use each technique will vary depending on the expenditure proposal we are assessing, but we intend to consider the inter-connections between our assessment techniques when determining total capex … forecasts. We typically would not infer the findings of an assessment technique in isolation from other techniques.

In arriving at our estimate, we weight the various techniques used in our assessment. We weight these techniques on a case by case basis using our judgement. Broadly, we give more weight to techniques we consider to be more robust in the particular circumstances of the assessment. By relying on a number of techniques, we ensure we consider a wide variety of information and can take a holistic approach to assessing the service provider's capex forecast.

We also take into account the various interrelationships between the total forecast capex and other components of a service provider's transmission determination. The other components that directly affect the total forecast capex include:

- forecast opex
- forecast demand
- the service target performance incentive scheme
- the capital expenditure sharing scheme
- real cost escalation
- contingent projects.

We discuss how these components impact the total forecast capex in Table 6.4.

Underlying our approach are two general assumptions:

- 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 or activity required to achieve the expenditure objectives,[19] and
- past expenditure was sufficient for ElectraNet to manage and operate its network in past periods, in a manner that achieved the capex objectives.[20]

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[19] AER, *Better regulation: Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 8- 9. The Tribunal has previously endorsed this approach: see : Application by Ergon Energy Corporation Limited (Non-system property capital expenditure) (No 4) [2010] ACompT 12; Application by EnergyAustralia and Others [2009] ACompT 8; Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11; Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14; Application by United Energy Distribution Pty Limited [2012] ACompT 1; Re: Application by ElectraNet Pty Limited (No 3) [2008] ACompT 3 ; Application by DBNGP (WA) Transmission Pty Ltd [2012] ACompT 6.

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

6.4.2 Comparing the service provider's proposal with our alternative estimate

Having established our estimate of the total forecast capex, we can test the service provider's proposed total forecast capex. This includes comparing our estimate of forecast total capex with ElectraNet's proposal. ElectraNet's forecasting methodology and its key assumptions may explain any differences between our alternative estimate and its proposal.

As the AEMC foreshadowed, we may need to exercise our judgement in determining whether any 'margin of difference' is reasonable:[21]

> The AER could be expected to approach the assessment of a NSP's expenditure (capex or opex) forecast by determining its own forecast of expenditure based on the material before it. Presumably this will never match exactly the amount proposed by the NSP. However there will be a certain margin of difference between the AER's forecast and that of the NSP within which the AER could say that the NSP's forecast is reasonable. What the margin is in a particular case, and therefore what the AER will accept as reasonable, is a matter for the AER exercising its regulatory judgment.

As noted above, we draw on a range of techniques, as well as our assessment of elements that impact upon capex such as demand and real cost escalators.

Our decision on the total forecast capex does not strictly limit a service provider's actual spending. A service provider might spend more on capex than the total forecast capex amount specified in our decision in response to unanticipated expenditure needs.

The regulatory framework has a number of mechanisms to deal with such circumstances. Importantly, a service provider does not bear the full cost where unexpected events lead to an overspend of the approved capex forecast. Rather, under the Capital Expenditure Sharing Scheme the service provider 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 service provider to pass on significant, unexpected capex to customers, where appropriate.[22] Similarly, a service provider may spend less than the capex forecast because they have been more efficient than expected. In this case the service provider will keep on average 30 per cent of this reduction over time in accordance with the Capital Expenditure Sharing Scheme.

We set our alternative estimate at the level where the service provider has a reasonable opportunity to recover efficient costs. The regulatory framework allows the service provider to respond to any unanticipated issues that arise during the regulatory control period. In the event that this leads to the approved total revenue

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21 AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, p. 112.

22 NER, r. 6A. 7.3.

underestimating the total capex required, the service provider should have sufficient flexibility to allow it to meet its safety and reliability obligations by reallocating its budget. Conversely, if there is an overestimation, the stronger incentives the AEMC put in place in 2012 should result in the service provider only spending what is efficient. As noted, the service provider and consumers share the benefits of the underspend and the costs of an overspend under the regulatory regime.

6.5 Reasons for draft decision

We applied the assessment approach set out in section 6.4 to ElectraNet. In this draft decision, we are satisfied ElectraNet's total forecast capex reasonably reflects the capex criteria. We compared ElectraNet's capex forecast to the alternative capex forecast we constructed using the approach and techniques outlined in appendices A and B. ElectraNet's proposal is not materially different from our alternative estimate. We are satisfied that both ElectraNet's forecast and our alternative estimate are likely to reasonably reflect the capex criteria, and that the margin of difference between them in reasonable in the circumstances. As noted above, we approve a total capex forecast and not particular categories, projects or programs in the capex forecast.

Table 6.3 sets out the capex amounts by driver that we included in our alternative estimate of ElectraNet's total forecast capex for the 2017–22 regulatory control period.

Table 6.3 Draft decision alternative estimate of required capex by capex driver 2018–23 ($2016–17, million)

Category	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Augmentation	13.8	1.6	0.1	-	-	15.6
Connection	-	-	-	-	-	-
Replacement	32.1	34.9	37.8	43.1	19.1	166.9
Refurbishment	10.0	38.3	48.1	41.0	21.8	159.1
Security and compliance	22.4	12.5	4.9	3.5	3.0	46.3
Inventory and spares	2.3	2.3	2.3	2.3	2.3	11.5
Business IT	14.6	8.0	9.0	9.4	6.5	47.5
Facilities	1.5	1.2	1.5	1.1	0.7	5.9
Total capex	96.7	98.7	103.7	100.4	53.3	452.8

Source: AER analysis.

Note: This forecast capex reflects real 2017-18 dollars using an estimate of expected inflation of 2.5 per cent, as discussed in Attachment 3 of this draft decision. Numbers may not add up due to rounding.

Our alternative estimate of $452.8 million is $6.3 million lower than ElectraNet's forecast of $459.1 million. This reflects our alternative estimate of connection capex driven by our assessment of the Gawler East connection point project proposed by ElectraNet. Based on the information available, it is not clear that the forecast capex for this project necessarily reflects the efficient costs that a prudent operator would

require to achieve the capex objectives in the 2018–23 regulatory control period. The demand growth driving the need for this expenditure is not captured by AEMO's connection point demand forecast, and the project is subject to a future RIT-D process which will confirm the preferred economic option, which may be a non-network or distribution network option.

Our assessments of capex drivers are set out in appendix B. These explain the application of our assessment techniques to the capex drivers, the weighting we gave to particular techniques, and how we determined our alternative estimate of forecast capex.

We discuss our assessment of ElectraNet's forecasting methodology, key assumptions and past capex performance in the sections below.

6.5.1 Ex post review of past capital expenditure

The capex incentive regime aims to ensure that only capex that is efficient should enter the regulatory asset base to be recovered from consumers.[23] We are required to provide a statement on whether past expenditure included in the roll forward of the regulatory asset base contributes to the achievement of the capital expenditure incentive objective.[24] For this decision, our statement relates only to the 2014–15 and 2015–16 regulatory years.[25]

We have assessed the extent to which the roll forward of the regulatory asset base from the 2013–18 regulatory control period to the commencement of the 2018–23 regulatory control period contributes to the achievement of the capital expenditure incentive objective.[26] The capital expenditure incentive objective essentially requires that only prudent and efficient expenditure is included in the regulatory asset base.

Our approach to this assessment applies the approach set out in our Capital Expenditure Incentive Guideline.[27] Our Guideline outlines a two stage process for assessing whether past expenditure is likely to be efficient and prudent.[28] The first stage considers whether a service provider has over-spent against its approved total capex forecast and how that expenditure compares with previous levels of capex and with other service providers.

As discussed in appendix E, our assessment of ElectraNet's past capex relates only to the 2014–15 and 2015–16 regulatory years. We are satisfied that ElectraNet's actual

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23 AEMC, *Final Position Paper - National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 15 November 2012, p. v.

24 NER cl. 6A.14.2.(b)

25 The NER requires that this statement will not apply to the regulatory year in which the Expenditure Incentive Guideline was published. As the Guideline was published in December 2013, our statement and assessment of whether any expenditure should be excluded from the RAB only covers the 2014-15 and 2015-16 regulatory years.

26 NER cl. S6A.2.2A

27 AER, *Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013.

28 AER, *Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013, pp.19-22.

capex incurred in the 2014–15 and 2015–16 regulatory years was likely to be prudent and efficient on the basis that:

- ElectraNet under-spent its total capex against our approved total capex forecast
- ElectraNet has demonstrated expenditure processes and practices consistent with a prudent and efficient service provider.

6.5.2 Key assumptions

The NER requires ElectraNet to include in its revenue proposal the key assumptions that underlie its proposed forecast capex. ElectraNet must also provide a certification by its Directors that those key assumptions are reasonable.[29]

The key assumptions and inputs that underlie ElectraNet's capex forecasts are:[30]

- demand forecasts
- asset condition assessments
- planning and design standards
- network model
- economic assessments
- risk assessments
- project cost estimation
- cost escalation
- project timing and delivery
- efficiency improvements.

We assessed ElectraNet's key assumptions in appendices B and C to this capex attachment. We are satisfied that the key assumptions and inputs applied by ElectraNet to estimate its forecast capex requirements for the 2018–23 regulatory control period are reasonable. This conclusion contributes to our draft decision that we are satisfied that ElectraNet's forecast capex reasonably reflects the capex criteria.

6.5.3 Forecasting methodology

The NER requires ElectraNet to set out the methodology it proposes to use to prepare its forecast capex allowance before it submits its revenue proposal.[31] ElectraNet must include this information in its revenue proposal.[32]

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29 NER, cll. S6A.1.1(2), (4) and (5).
30 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 33.
31 NER, cl. 6A.10.1B.
32 NER, cl. 6A.10.1.

The capex forecasting methodology used to develop ElectraNet's capex forecast is consistent with the methodology notified to us in June 2016.[33] ElectraNet has adopted a 'bottom-up' forecasting approach, meaning that ElectraNet's total forecast capex is an aggregate of individually planned projects and programs.[34]

ElectraNet submitted that the starting point for its capex forecasting is to understand its customers' requirements through effective engagement to shape expenditure priorities. ElectraNet then follows a systematic process to develop plans and initiate projects to deliver a safe, reliable and sustainable transmission network to meet customer requirements in the most cost effective manner.[35] The approach taken differs for different categories of expenditure as follows:[36]

- Load-driven network investment requirements are identified through modelling future power system capability and analysing future network constraints.
- Non-load driven network investment requirements are determined in accordance with ElectraNet's asset management framework, which takes a risk-based approach to the replacement or refurbishment of assets based on assessed risk, condition and performance.
- Non-network investment requirements are determined in accordance with the strategic priorities for information technology, to provide for the development and operation of business systems and supporting facilities required to manage the network and supporting business functions.

6.5.4 ElectraNet's capex performance

We have looked at a number of historical metrics of ElectraNet's capex performance to help inform our assessment of ElectraNet's proposed capex forecast. This includes ElectraNet's relative multilateral total factor productivity (MTFP) and capital multilateral partial factor productivity (MPFP) performance from our most recent annual benchmarking report, and its proposed forecast capex allowance against historical trends.

In assessing ElectraNet's forecast of required capex, we must have regard to our most recent annual benchmarking report.[37] This section shows how we have taken it into account. We consider this high level benchmarking at the total expenditure and total capex level is suitable to gain an overall understanding of ElectraNet's proposal in a broader context. However, in our capex assessment we have not relied on our high level benchmarking metrics set out below other than to note that these metrics generally support the conclusions reached based on our other assessment techniques. MTFP analysis is in its early stage of development in application to transmission

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33 ElectraNet, *Expenditure Forecast Methodology 2018-19 to 2022-23*, June 2016.

34 ElectraNet, *Expenditure Forecast Methodology 2018-19 to 2022-23*, June 2016, p. 10.

35 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 31.

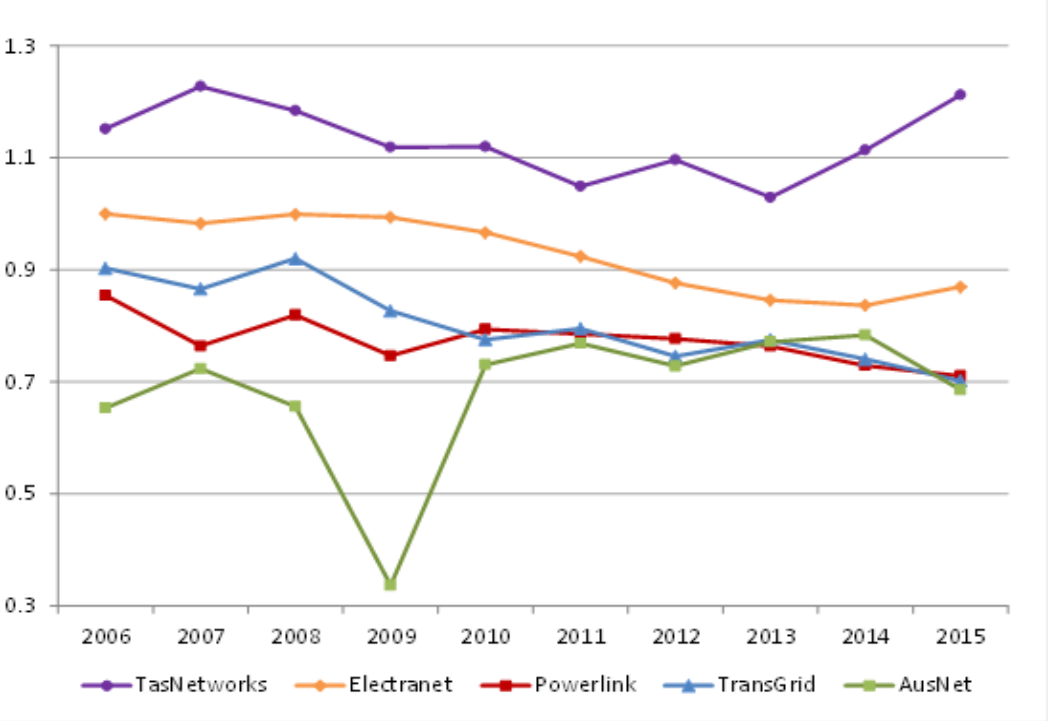
36 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 32.

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

networks. Further, there are only a few electricity transmission networks within Australia which makes efficiency comparisons at the aggregate expenditure level difficult. We have therefore not used this analysis in a determinative way in our capex assessment.

Figure 6.1 shows ElectraNet's MTFP performance over time and relative to other service providers. MTFP measures how efficient a business is in terms of its inputs (capex and opex) and outputs (for example maximum demand, reliability, circuit line length and energy throughput). These results show that ElectraNet's productivity has declined since 2008 but improved in the most recent year. ElectraNet submitted that it performed well in overall productivity terms, ranking second amongst the five TNSPs.[38]

Figure 6.1 Relative MTFP performance of transmission networks



Source: AER, *Annual Benchmarking Report - Electricity transmission network service providers*, 30 November 2016, p. 15.

Figure 6.2 shows ElectraNet's MPFP performance over time and relative to other service providers. The MPFP analysis uses the same output specification as the MTFP technique, but measures the productivity of capex in isolation. Again, this shows that ElectraNet's capex productivity has declined over time but improved in the most recent year. ElectraNet submitted that, as for the MTFP analysis, our benchmarking shows that ElectraNet is also ranked second in terms of its capex efficiency.[39]

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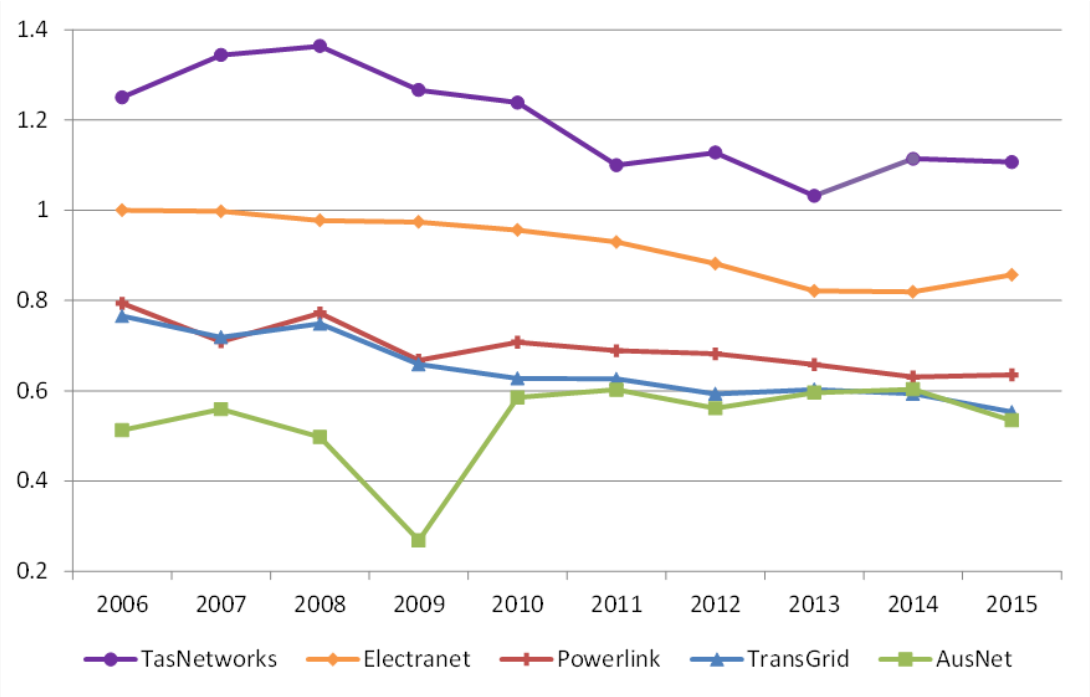
[38] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 41.

[39] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 42.

Figure 6.2 Relative capital MPFP performance of transmission networks



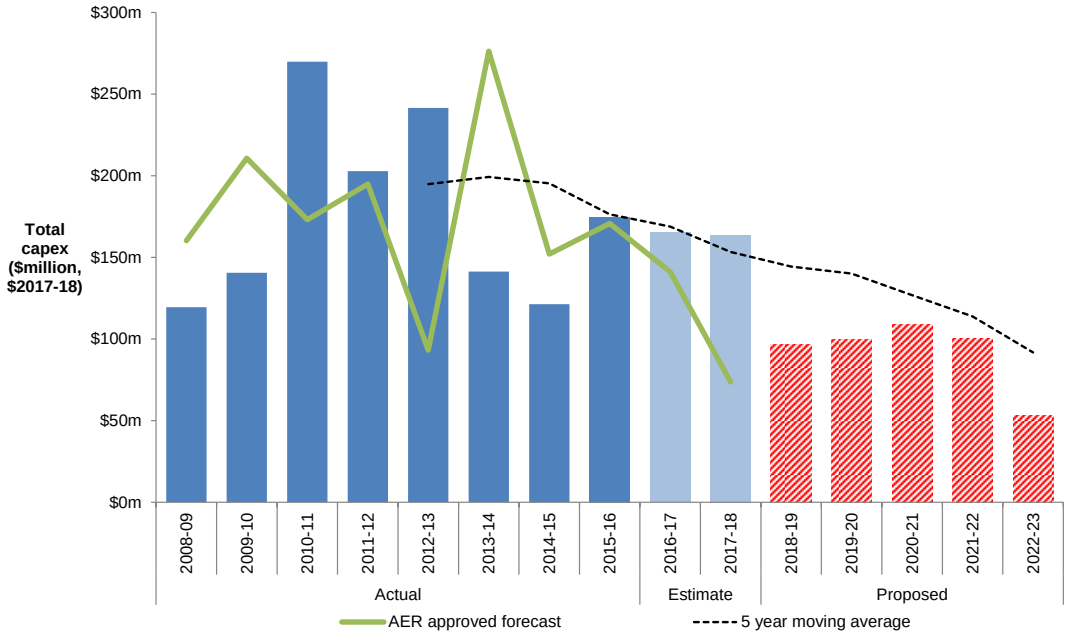
Source: AER, *Annual Benchmarking Report - Electricity transmission network service providers*, 30 November 2016, p. 17.

6.5.4.1 ElectraNet's historical capital expenditure trends

We compared ElectraNet's capex proposal for the 2018–23 regulatory control period against the long term historical trend in capex levels.

Figure 6.3 shows actual historic capex and proposed capex between 2008 and 2023. This figure shows that ElectraNet has forecast capex in the 2018–23 regulatory control period to be substantially lower than actual and estimated capex in the 2013–18 regulatory control period. ElectraNet's capex forecast for the 2018–23 regulatory control period is also forecast to decline to relatively low levels compared to longer term historical expenditure.

Figure 6.3 ElectraNet total capex - historical and forecast ($2017–18)



Source: ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis.

ElectraNet stated its forecast capex is approximately 39 per cent lower than actual and estimated capex in the 2013–18 regulatory control period, which is approximately 6 per cent less than our allowance for the that period. ElectraNet submitted that a key driver of its lower capex forecast is the decline in demand growth in South Australia, which means that only a very small amount of load-driven capex is required in the 2018–23 regulatory control period.[40]

6.5.5 Interrelationships

There are a number of interrelationships between ElectraNet's total forecast capex for the 2018–23 regulatory control period and other components of its transmission determination (see Table 6.4). We considered these interrelationships in coming to our draft decision on total forecast capex.

Table 6.4 Interrelationships between total forecast capex and other components

Other component	Interrelationships with total forecast capex
Total forecast opex	There are elements of ElectraNet's total forecast opex that are related to its total forecast capex. These include the forecast labour price growth that we included in our opex forecast in Attachment 7. This is because the price of labour affects both total forecast opex and, to a lesser extent, total forecast capex.

[40] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 6.

Other component	Interrelationships with total forecast capex
	More generally, we note our total opex forecast will provide ElectraNet with sufficient opex to maintain the reliability and safety of its network. Although we do not approve opex on specific categories of opex such as maintenance, ElectraNet's total opex will in part influence the repex ElectraNet needs to spend during the 2018–23 period. ElectraNet submitted that it considers the interaction between forecast opex and capex in the 2018–23 regulatory control period is limited because there is minimal network growth and no step changes are proposed.[41]
Forecast demand	Forecast demand is related to ElectraNet's total forecast capex. Load driven capex, which includes augex, connections and easements capex, is typically triggered by a need to build or upgrade the network to address changes in demand or to comply with quality, reliability and security of supply requirements. Hence, the main driver of load related capex is maximum demand and its effect on network utilisation and reliability. Falling minimum demand levels may also reveal network limitations that may require investment. Forecast demand also affects the need and timing of asset replacement capex as this affects the risk of unserved energy as a result of asset failure. In circumstances of flat or falling demand, it may be possible to decommission aged assets, or to re-configure the network to avoid the need to replace specific assets. Maximum demand and its effect on network utilisation and reliability is therefore also a driver of replacement related capex. Growth in demand in South Australia has decreased and is projected to fall further. ElectraNet submitted that the transmission network has sufficient capacity to meet projected demand over the 2018–23 regulatory control period, such that minimal load-driven investment is required. ElectraNet has adopted AEMO's latest maximum and minimum demand forecasts in determining its forecast capex requirements.[42]
Capital Expenditure Sharing Scheme (CESS)	The CESS is related to ElectraNet's total forecast capex. In particular, the effective application of the CESS is contingent on the approved total forecast capex being efficient, and that it reasonably reflects the capex criteria. As we note in the capex criteria table below, this is because any efficiency gains or losses are measured against the approved total forecast capex. In addition, we are required to undertake an ex post review of the efficiency and prudency of capex, with the option to exclude any inefficient capex in excess of the approved total forecast capex from ElectraNet's regulatory asset base. In particular, the CESS will ensure that ElectraNet bears at least 30 per cent of any overspend against the capex allowance. Similarly, if ElectraNet can fulfil its objectives without spending the full capex allowance, it will be able to retain 30 per cent of the benefit. In addition, if an overspend is found to be inefficient through the ex post review, ElectraNet risks having to bear the entire overspend. The CESS will apply to ElectraNet in the 2018–23 regulatory control period.
Service Target Performance Incentive Scheme (STPIS)	The STPIS is interrelated to ElectraNet's total forecast capex, in so far as it is important that it does not include expenditure for the purposes of improving supply reliability during the 2018–23 regulatory control period. This is because such expenditure should be offset by rewards provided through the application of the STPIS. Further, the forecast capex should be sufficient to allow ElectraNet to maintain performance at the targets set under the STPIS. The capex allowance should not be set such that there is an expectation that it will lead to ElectraNet systematically under or over performing against its targets. Priority projects identified by ElectraNet under its Network Capability Incentive Parameter Action Plan (NCIPAP) are excluded from forecast capex in the 2018–23 regulatory control period.
Contingent projects	Generally, contingent projects are significant network augmentation projects that are reasonably required to be undertaken in order to achieve the capex objectives. However, unlike other proposed capex projects, the need for the project within the regulatory control period and the associated costs are not sufficiently certain. Consequently, expenditure for

41 ElectraNet, *Revenue proposal 2019-23 – Attachment 7 Operating Expenditure*, 28 March 2017, p. 17.

42 ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, pp. 33-35.

Other component	Interrelationships with total forecast capex
	such projects does not form a part of the total forecast capex that we approve in this determination. ElectraNet proposed $630-950 million for five contingent projects for the 2018–23 period. ElectraNet's proposed projects are for maintaining supply security and reliability in Eyre Peninsula, facilitating greater competition in the wholesale electricity market, maintaining the integrity of its transmission lines should loads increase due to mining activities and maintain minimum fault levels. The interrelationship between ElectraNet's proposed Eyre Peninsula Reinforcement contingent project and ex ante line replacement capex for the Eyre Peninsula region is discussed further in Appendix B.

Source: AER analysis.

6.5.6 Consideration of the capex factors

As we discussed in section 6.3, we have had regard to the capex factors when assessing ElectraNet's total capex forecast.[43] Table 6.5 summarises how we have had regard to the capex factors.

Table 6.5 AER consideration of the capex factors

Capex factor	AER consideration
The most recent annual benchmarking report and benchmark capex that would be incurred by an efficient service provider over the relevant regulatory control period	We had regard to our most recent benchmarking report in assessing ElectraNet's proposed total forecast for the 2018–23 regulatory control period. This can be seen in the metrics we used in our assessment of ElectraNet's capex performance in section 6.5.4.
The actual and expected capex of ElectraNet during any preceding regulatory control periods	We had regard to ElectraNet's actual and expected capex during the 2013–18 regulatory control period and preceding regulatory control periods in assessing its proposed total forecast. This can be seen in our assessment of ElectraNet's capex performance. It can also be seen in our assessment of the capex drivers, projects and programs that underlie ElectraNet's total forecast capex, including through trend analysis.
The extent to which the capex forecast includes expenditure to address concerns of electricity consumers as identified by ElectraNet in the course of its engagement with electricity consumers	We had regard to the extent to which ElectraNet engaged with customers in its approach to forecasting capex. ElectraNet has undertaken an extensive and transparent program of consumer engagement to inform its revenue proposal. Feedback from consumer groups regarding the extent to which ElectraNet has considered and addressed the concerns of consumers in preparing its capex proposal is generally positive.
The relative prices of operating and capital inputs	We had regard to the relative prices of operating and capital inputs in assessing ElectraNet's proposed real cost escalation factors. In particular, we have accepted ElectraNet's proposed cost escalation for labour as applied to forecast capex.
The substitution possibilities between operating and capital expenditure	We had regard to the substitution possibilities between opex and capex. We considered whether there are more efficient and prudent trade-offs in investing more or less in capital in place of

[43] NER, cll. 6.5.7(c), (d) and (e).

Capex factor	AER consideration
	ongoing operations. See our discussion about the interrelationships between ElectraNet's total forecast capex and total forecast opex in Table 6.4 above.
Whether the capex forecast is consistent with any incentive scheme or schemes that apply to ElectraNet	We had regard to whether ElectraNet's proposed total forecast capex is consistent with the CESS and the STPIS. See our discussion about the interrelationships between ElectraNet's total forecast capex and the application of the CESS and the STPIS in Table 6.4 above.
The extent to which the capex forecast is referrable to arrangements with a person other than the service provider that do not reflect arm's length terms	We had regard to whether any part of ElectraNet's proposed total forecast capex or our alternative estimate is referrable to arrangements with a person other than ElectraNet that do not reflect arm's length terms. Based on the information provided by ElectraNet we are satisfied that the capex forecast is based on arrangements that reflect arm's length terms.
Whether the capex forecast includes an amount relating to a project that should more appropriately be included as a contingent project	We had regard to whether any amount of ElectraNet's proposed total forecast capex relates to a project that should more appropriately be included as a contingent project. ElectraNet proposed both ex ante capex and a contingent project driven by the need to maintain reliability in the Eyre Peninsula region. We are satisfied that these amounts are mutually exclusive and individually justified under the relevant NER criteria for ex ante and contingent capex proposals. We did not identify any amounts that should more appropriately be included as a contingent project.
The most recent National Transmission Network Development Plan (NTNDP), and any submissions made by AEMO, in accordance with the Rules, on the forecast of ElectraNet's required capex	We have taken into account the most recent NTNDP and AEMO's independent planning review of ElectraNet's capex projects in assessing ElectraNet's forecast capex. ElectraNet's forecast capex is consistent with its most recent NTNDP. See appendix B.
The extent to which ElectraNet has considered and made provision for efficient and prudent non-network alternatives	We have had regard to the extent to which ElectraNet made provision for efficient and prudent non-network alternatives. ElectraNet makes provision for non-network alternatives in its integrated planning assessments. Given the flat demand outlook, ElectraNet submitted that there are minimal load driven projects in its capex forecast, with a focus on individual component asset replacement, life extension works, and targeted network security measures. The nature of these requirements can limit the scope for efficient non-network alternatives to provide technically and economically viable solutions.[44] See appendix B for further details on specific projects.
Any relevant project assessment conclusions report required under clause 5.16.4 of the NER	We have had regard to the extent to which ElectraNet made relevant project assessment conclusions under clause 5.16.4 of the NER. There are no current project assessment conclusion reports relevant to ElectraNet's forecast capex for the 2018–23 regulatory control period.
Any other factor the AER considers relevant and which the AER has notified ElectraNet in writing, prior to the submission of its revenue proposal, is a capex factor	We did not identify any other capex factor that we consider relevant.

Source: AER analysis.

[44] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 37.

6.5.7 Summary of submissions on ElectraNet's capex proposal

Table 6.6 provides a summary of stakeholder submissions on ElectraNet's capex proposal and our response.

Table 6.6 Submissions on ElectraNet's capex proposal

Stakeholder	Issue	Our response
Consumer Challenge Panel - Sub-Panel 9 (CCP)	The CCP welcomed the proposed reduction in forecast capex, and ElectraNet's prudent approach to replacement and refurbishment capex which appeared to be well in advance of its peers. However, the CCP noted that ElectraNet's proposal included significant contingent capex which had the potential to eclipse the reductions from earlier periods. Specifically, the CCP recommended that:[45] • ElectraNet should extend its high quality approach to consumer engagement to RIT-T processes. • NCIPAP project proposals should be reviewed in light of outcomes of the SA Energy Transformation RIT-T. • the inclusion of $6.4m for the Dalrymple battery storage project should be reviewed for relevance following the South Australian government's announcement of the 100MW battery at the Hornsdale wind farm. • ElectraNet, AEMO and the AER should provide a clear, explicit indication of the consolidated cost to consumers of system security initiatives in time for the revised regulatory proposal. • the AER should include the probable impact of contingent projects on revenues and prices in the draft determination. • the AER should form a strong view on the most appropriate governance arrangements for the path forward for Eyre Peninsula's electricity infrastructure, noting the concerns raised by ESCOSA in relation to joint planning. This could include rejecting the ex-ante proposal for capital expenditure and including this	ElectraNet's NCIPAP projects do not form part of the forecast capex proposal considered in this attachment. The Dalrymple energy storage project will be completed as a priority project in the 2013–18 regulatory control period, and therefore no longer forms part of ElectraNet's forecast capex for the 2018–23 regulatory control period. ElectraNet has identified other current projects of equivalent cost which, due to resourcing constraints, will be deferred into the 2018–23 regulatory control period. ElectraNet's specific system security related capex and relevant contingent projects are discussed in appendix B. There is significant uncertainty surrounding the scope, timing and cost of ElectraNet's contingent projects, such that providing a reasonable estimate of possible revenue and price impacts is difficult. This is discussed further in attachment 1 of this draft decision. We have accepted ElectraNet's forecast capex, including for the Eyre Peninsula line replacement project, as reasonably reflecting the capex criteria. We have also included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process.

[45] Consumer Challenge Panel (Sub-Panel 9), *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017, pp. iii-iv and 29-38.

Stakeholder	Issue	Our response
	expenditure in the scope of the Eyre Peninsula Contingent Project.	
Business SA	Business SA welcomed ElectraNet's forecast 39 per cent reduction in capex, and the transparency provided by ElectraNet regarding its future expenditure plans. Business SA also supported ElectraNet's endeavours to improve reliability in the Eyre Peninsula region, but noted that the AER should carefully consider the justification for any real labour cost escalation sought by ElectraNet.[46]	We have included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process. We discuss ElectraNet's proposed real labour cost escalation in Attachment 5 of this draft determination. Forecast real labour costs will be updated in ElectraNet's revised proposal and our final decision.
South Australian Chamber of Mines and Energy (SACOME)	SACOME supported the inclusion of the North-East Line Reinforcement, North-West Line Reinforcement, and Eyre Peninsula Reinforcement projects as contingent projects for the 2018–23 regulatory control period. SACOME submitted that these projects are in regions where significant mineral and energy developments are expected within the next five years, and that transmission asset reinforcement is required to meet future load demand.[47]	We have included ElectraNet's Upper North-East Line Reinforcement, Upper North-West Line Reinforcement and Eyre Peninsula Reinforcement projects as a contingent projects for the 2018–23 regulatory control period.
Leigh Creek Energy	Leigh Creek Energy supported the reinforcement of the Upper North-East (Davenport - Leigh Creek 132kV) line to ensure: • a reliable source of power during construction of the Leigh Creek Energy Project (LCEP) commercial production facilities • a reliable backup power supply as the LCEP diversifies from power production to the supply of other products such as natural gas, ammonia and ammonium nitrate products.	We have included ElectraNet's Upper North-East Line Reinforcement project as a contingent project for the 2018–23 regulatory control period.
Iron Road	Iron Road outlined the expected transmission network requirements of its planned mining and minerals processing project on the Eyre Peninsula, and supported ElectraNet's proposed Eyre Peninsula Reinforcement contingent project.[48]	We have included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process.
South Australian Council of Social	SACOSS submitted that it had sought the advice of Carbon + Energy Markets in	

[46] Business SA, *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017, pp. 1-4.

[47] South Australian Chamber of Mines and Energy, *Submission on ElectraNet's Revenue Proposal 2018–23*, 11 July 2017, pp. 1-3.

[48] Iron Road Limited, *Submission on ElectraNet's Revenue Proposal 2018–23*, 7 July 2017, p. 1.

Stakeholder	Issue	Our response
Service (SACOSS)	relation to ElectraNet's proposed capex. SACOSS supported the reasoning and findings of the advice from Carbon + Energy Markets, specifically that:[49] • it did not support the proposed capex for replacement of lines on the Eyre Peninsula. The decision on this work should be deferred until there is evidence that failing to undertake the work will have significant and imminent impact on reliability and/or public safety • forecast capex for the Dalrymple energy storage project should not be included in ElectraNet's RAB, but rather should be expensed in a similar way to network support payments.	We have accepted ElectraNet's forecast capex, including for the Eyre Peninsula line replacement project, as reasonably reflecting the capex criteria. We discuss this further in appendix B. The Dalrymple energy storage project will now be completed as a priority project in the 2013–18 regulatory control period. We discuss the roll forward of ElectraNet's RAB in attachment 2 of this draft decision.
Uniting Communities	Uniting Communities submitted that:[50] • some network hardening is required in order for the network to withstand extreme storms • having discussed the Eyre Peninsula line upgrade proposals with ElectraNet, it supports cost effective network upgrades to increase reliability to Eyre Peninsula towns while also providing for economic expansion. ElectraNet should continue to engage with consumers and other stakeholders through the formal RIT-T process. • it is supportive of ElectraNet's risk assessment methodology, subject to more detailed engineering advice • in relation to contingent projects, there are unique circumstances for ElectraNet that make prediction of weather and shifting demand difficult. Local and regional variation in loads suggests that the trigger events for each of ElectraNet's proposed contingent are possible, and perhaps probable during the 2018–23 regulatory control period.	We have accepted ElectraNet's forecast capex, including for the Eyre Peninsula line replacement project, as reasonably reflecting the capex criteria. We have also included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process. We discuss ElectraNet's risk assessment methodology and input assumptions in appendix B. We have accepted ElectraNet's proposed contingent projects as contingent projects for the 2018–23 regulatory control period, with minor changes to the wording of some project triggers.
Department of the Premier and	The Energy and Technical Regulation Division of the DPC:[51]	The Dalrymple energy storage project will now be completed as a priority project in the 2013–

[49] South Australian Council of Social Service, *Submission on ElectraNet's Revenue Proposal 2018–23*, 13 July 2017, p. 3.

[50] Uniting Communities, *Submission on ElectraNet's Revenue Proposal 2018–23*, July 2017, pp. 12-14.

[51] Government of South Australia, Department of the Premier and Cabinet, *Submission on ElectraNet's Revenue Proposal 2018–23*, 12 July 2017, pp. 1-4.

Stakeholder	Issue	Our response
Cabinet (DPC)	• supported inclusion of the regulated component of the Dalrymple energy storage project in ElectraNet's forecast capex given the expected customer benefits	18 regulatory control period. Other projects of equivalent cost will be deferred into the 2018–23 regulatory control period to allow this to occur, such that no change to total forecast capex is required.
	• supported ElectraNet's proposal for a small number of new projects to further improve the resilience of the network, including the 'substation improvement for system black conditions' project, subject to the AER confirming the justification and reasoning for these projects	We have accepted ElectraNet's forecast capex, including for the additional projects proposed to improve network resilience following the September 2016 system black event, as reasonably reflecting the capex criteria.
	• noted AEMO's advice that the installation of reactors at Blyth West, Templers West and Para be combined and considered as a single project as they are interrelated and address a single emerging need	ElectraNet has accounted for the efficiencies of conducting the three similar projects in its proposal, through reduced design costs.
	• supported the inclusion of both an ex ante capex project to partially replace transmission lines on the Eyre Peninsula, and the Eyre Peninsula Reinforcement contingent project with the conclusion of the current RIT-T process as an appropriate project trigger.	We have accepted ElectraNet's forecast capex, including for the Eyre Peninsula line refurbishment project, as reasonably reflecting the capex criteria. We have also included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process.
	• supported the inclusion of the South Australian Energy Transformation contingent project, with the outcome of the RIT-T process forming an appropriate trigger	We have included ElectraNet's South Australian Energy Transformation project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process.
	• noted that decisions involving contingent capex for the Main Grid System Strength contingent project should be balanced against ongoing consideration of the regulatory frameworks being developed that affect system security in the NEM.	We have included ElectraNet's Main Grid System Strength project as a contingent project for the 2018–23 regulatory control period. This project remains the subject to conclusion of a successful RIT-T process.
District Council of Lower Eyre Peninsula (DCLEP)	DCLEP supported the refurbishment of ElectraNet's Eyre Peninsula transmission lines and requested that ElectraNet consider upgrading the Eyre Peninsula network to provide a dual circuit 275kV line, or at minimum a dual circuit 132kV line as the spine of the Eyre Peninsula network.[52]	We have accepted ElectraNet's forecast capex, including for the Eyre Peninsula line refurbishment project, as reasonably reflecting the capex criteria. We have also included ElectraNet's Eyre Peninsula Reinforcement project as a contingent project for the 2018–23 regulatory control period. This project remains the subject of an ongoing RIT-T process.

Source: AER analysis

[52] District Council of Lower Eyre Peninsula, *Submission on ElectraNet's Revenue Proposal 2018–23*, 2 August 2017.

A Assessment techniques

This appendix describes the assessment approaches we have applied in assessing ElectraNet's proposed forecast capex. The extent to which we rely on each of the assessment techniques is set out in appendix B.

The assessment techniques that we apply in capex are necessarily different from those we apply in the assessment of opex. This is reflective of differences in the nature of the expenditure being assessed. As such, we use some assessment techniques in our capex assessment that are not suitable for assessing opex and vice versa. We set this out in our Expenditure Guideline, where we stated:[53]

> Past actual expenditure may not be an appropriate starting point for capex given it is largely non-recurrent or 'lumpy', and so past expenditures or work volumes may not be indicative of future volumes. For non-recurrent expenditure, we will attempt to normalise for work volumes and examine per unit costs (including through benchmarking across TNSPs) when forming a view on forecast unit costs.
>
> Other drivers of capex (such as replacement expenditure and connections works) may be recurrent. For such expenditure, we will attempt to identify trends in revealed volumes and costs as an indicator of forecast requirements.

The assessment techniques that we have used to assess ElectraNet's capex are set out below.

A.1 Economic benchmarking

Economic benchmarking is one of the key outputs of our annual benchmarking report. We are required to consider economic benchmarking as it is one of the capex factors under the NER.[54] Economic benchmarking applies economic theory to measure the efficiency of a service provider's use of inputs to produce outputs, having regard to operating environment factors.[55] It allows us to compare the performance of a service provider against its own past performance, and the performance of other service providers. Economic benchmarking helps us to assess whether a service provider's capex forecast represents efficient costs.[56] As stated by the AEMC, 'benchmarking is a critical exercise in assessing the efficiency of a NSP'.[57]

A number of economic benchmarks from the annual benchmarking report are relevant to our assessment of capex. These include measures of total cost efficiency and

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53 AER, *Better regulation: Expenditure forecast assessment guideline for electricity transmission*, November 2013, p.10.

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

55 AER, *Explanatory Statement: Expenditure Forecasting Assessment Guidelines*, November 2013.

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

57 AEMC, *National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, November 2012, p. 25.

overall capex efficiency. In general, these measures calculate a service provider's efficiency with consideration given to its inputs, outputs and its operating environment. We have considered each service provider's operating environment insofar as there are factors that are outside of a NSP's control but which affect a NSP's ability to convert inputs into outputs.[58] Once such exogenous factors are taken into account, we expect service providers to operate at similar levels of efficiency. One example of an exogenous factor that we have taken into account is customer density. For more on how we have forecast these measures, see our annual benchmarking report.[59]

For transmission NSPs we consider this economic benchmarking can give an indication of how the efficiency of each service provider has changed over time. We accept that it is not currently robust enough to draw conclusions about the relative efficiency of these service providers.

A.2 Trend analysis

We have considered past trends in actual and forecast capex. This is one of the capex factors that we are required to have regard to.[60]

Trend analysis involves comparing service providers forecast capex and work volumes against historic levels. Where forecast capex and volumes are materially different to historic levels, we seek to understand the causes of these differences. In doing so, we consider the reasons given by the service providers in their proposals, as well as changes in the circumstances of the service provider.

In considering whether a service provider's capex forecast reasonably reflects the capex criteria, we need to consider whether the forecast will allow the business to maintain reliability and safety performance, and comply with relevant regulatory obligations.[61] The requirements to maintain reliability and safety, including regulatory obligations (specifically, service standards) are key drivers of capex. More onerous standards will typically increase capex, conversely, reduced service obligations will likely cause a reduction in the amount of capex required by a service provider.

Maximum demand is also a driver of replacement expenditure as changes in demand will affect the economic value of asset failure. As replacement often needs to occur prior to demand growth being realised, forecast rather than actual demand is relevant when a business is deciding what replacement projects will be required in an upcoming regulatory control period. However, to the extent that revised forecasts differ from the initial demand forecast, a service provider should incorporate this updated information in a timely manner and should reassess the need and timing for the projects.

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58 See AEMC, *National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, November 2012, p.113. Exogenous factors could include geographic factors, customer factors, network factors and jurisdictional factors.

59 AER, *Annual Benchmarking Report - Electricity transmission network service providers*, 30 November 2016.

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

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

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 in 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 a NSP's capex requirements.

We have looked at trends in capex across a range of levels, including at the total capex level, for load driven, non-load driven and non-network capex, and other sub-categories of capex as relevant.

A.3 Methodology review

We have considered the methodology that ElectraNet has used to determine its capex forecasts, including assumptions, inputs and models. This has involved reviewing whether ElectraNet's methodology is a sound basis for developing expenditure forecasts that reasonably reflect the capex criteria.[62]

Where we are not satisfied that the forecasting methodology is likely to reasonably reflect prudent and efficient costs, we adjust the methodology such that it is a reasonable basis for developing expenditure forecasts that reasonably reflect the capex criteria. In some circumstances we may consider the methodology to be reasonable but may not consider the inputs or assumptions used in a service providers' proposed forecasting methodology to be reasonable.

In relation to ElectraNet's proposed capex we have focused on the following key inputs used in its expenditure forecasting methodology:

- unit cost estimation used to derive project cost estimates
- the application of risk cost modelling in the economic assessment of project options, including relevant inputs and assumptions.

We have also taken into account the extent to which the process used by ElectraNet to establish its forecast capex requirements included engagement with electricity consumers, and have had regard to the extent to which the outcomes of this engagement are reflected in the capex forecast. The extent to which the capex forecast includes expenditure to address the concerns of customers identified in the course of the engagement process is an increasingly important element of capex forecasting, and is one of the capex factors that we are required to have regard to.[63]

We have considered these factors as they relate directly to our assessment of whether ElectraNet's proposal reflects the efficient costs that a prudent operator would require to achieve the capex objectives.

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62 AER, *Expenditure Forecasting Assessment Guideline*, December 2013.

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

B Assessment of capex drivers

B.1 Alternative estimate

Having examined ElectraNet's proposal, we formed a view on our alternative estimate of the capex required to reasonably reflect the capex criteria. Our alternative estimate is based on our assessment techniques (refer to appendix A). Our weighting of each of these techniques is set out under the capex drivers in this appendix.

Our alternative estimate of total forecast capex for the 2018–23 regulatory control period is $452.8 million ($2017–18).

We have compared our alternative estimate of total forecast capex with ElectraNet's forecast, including considering the reasons for the difference. ElectraNet's forecast total capex is one per cent higher than our alternative estimate of total forecast capex. We are satisfied that this is a reasonable margin of difference in the circumstances, such that ElectraNet's total forecast capex is likely to reasonably reflect the capex criteria.

B.2 Forecast load-driven network capex

Position

We have determined an alternative estimate of ElectraNet's forecast non-load driven capex requirements of $15.6 million ($2017–18) as a reasonable estimate of forecast capex requirements for this category. This is $6.3 million or 29 per cent lower than ElectraNet's proposal. We arrived at our alternative estimate by excluding forecast capex for the Gawler East connection point project from ElectraNet's forecast of non-load driven capex requirements. In our view, it is not clear that the forecast capex for this project reflects the efficient costs that a prudent operator would require to achieve the capex objectives.[64] The demand forecast driving the need for this expenditure is not captured in AEMO's connection point demand forecast and the project will be subject to a future RIT-D process to confirm the preferred economic option.

We are satisfied that our alternative estimate reasonably reflects the capex criteria. In coming to this view, as discussed in Appendix A, we applied:

- trend analysis, comparing past trends in total actual and forecast capex for the proposed load driven capex, and
- a methodology review of ElectraNet's expenditure forecasting methodology, including key inputs and assumptions, as applied to the proposed major load-driven capex projects.

[64] NER, cl. 6A.6.7(c)(1) and cl. 6A.6.7(c)(2).

ElectraNet's revenue proposal

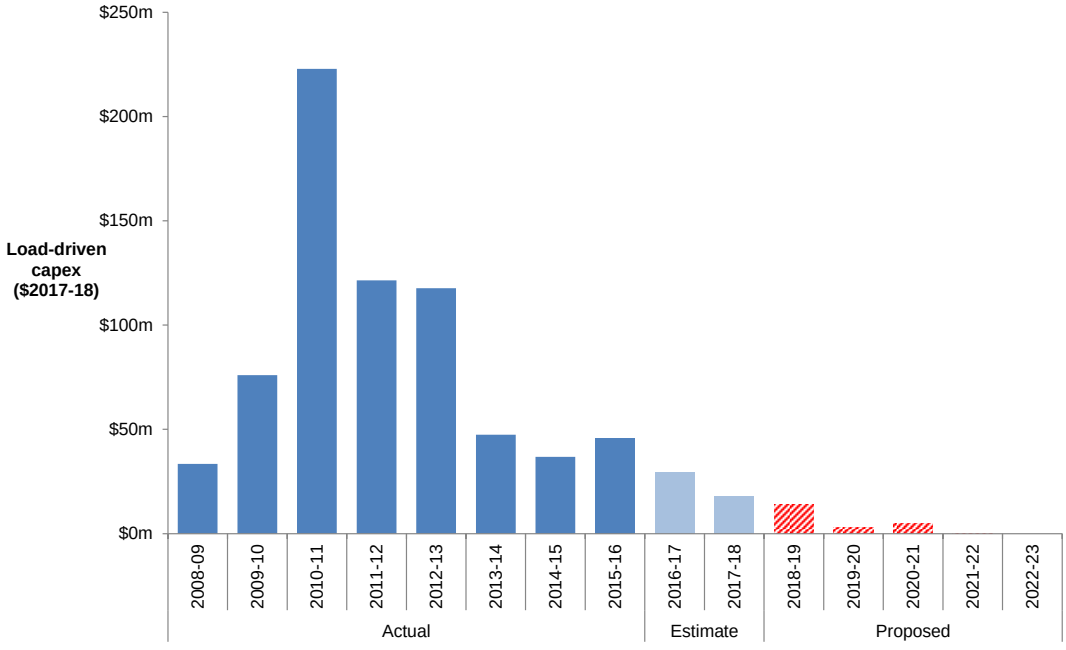
ElectraNet proposed $21.9 million ($2017–18) in load-driven capex for the 2018–23 regulatory control period, including $15.6 million for augmentation capex and $6.3 million for connection capex. This is less than five per cent of total forecast capex. ElectraNet submitted that minimal load-driven capex is required in the 2018–23 regulatory control period due to declining demand.[65] We consider forecast maximum demand in appendix .

ElectraNet has also proposed five contingent capex projects, some of which are triggered by material load increases in specific locations. Our consideration of these proposed contingent projects is discussed in appendix D.

AER non-load driven capex findings

ElectraNet's trend in actual and forecast load-driven capex is shown in Figure 6.4 below. This shows the trend of reducing load-driven capex continuing into the 2018–23 regulatory control period, with total forecast load-driven capex approximately 87 per cent lower than actual and estimated load-driven capex in the 2013–18 regulatory control period.

Figure 6.4 ElectraNet's load-driven capex ($million, 2017–18)



Source: ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis.

[65] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 22 and 43.

We observe that ElectraNet's forecast load-driven capex is low compared to historical levels of expenditure, and appears consistent with the drivers of expenditure in this category.[66] Specifically, this reflects AEMO's forecast of declining maximum demand in South Australia over the 2018–23 regulatory control period.

ElectraNet's forecast load-driven capex included two significant projects with capex of greater than $5 million. These are the Dalrymple energy storage project and the Gawler East connection point project. The two projects account for 58 per cent of ElectraNet's forecast load-driven capex. We examined the Dalrymple and Gawler East projects to assess the need and drivers of these specific projects, in the context of the overall declining requirement for augmentation across ElectraNet's transmission network in the 2018–23 regulatory control period.

Dalrymple Energy Storage Project

ElectraNet proposed forecast capex of $6.5 million for the Dalrymple energy storage project.[67] The Dalrymple energy storage project relates to the regulated component of a project to install a utility scale (30 MW) battery at Dalrymple as a 'proof of concept' to demonstrate:[68]

- the application of fast acting battery storage to provide system security services, such as fast frequency response that can address system security risks
- islanded operation during contingency periods, whereby local supply balanced by the battery storage can improve local reliability and provide learnings relevant to the operation of systems with 100 per cent intermittent renewable generation.

ElectraNet proposed that only a component of the project cost would be recovered through regulated revenue for prescribed transmission services. The remainder of the project costs would be recovered through unregulated revenue, including through a lease contract with AGL and grant funding from the Australian Renewable Energy Agency (ARENA).[69]

We sought additional information relating to the economic assessment undertaken by ElectraNet to justify the prudency and efficiency of the forecast capex for the Dalrymple energy storage project.[70] ElectraNet provided a summary of the project economic assessment undertaken in support of the project,[71] but also advised that:

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

67 ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis. This reflects ElectraNet's forecast capex in real 2017-18 dollars using an estimate of expected inflation of 2.5 per cent.

68 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Appendix A - Forecast Network Capital Projects*, 28 March 2017, pp. 30-31.

69 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Appendix A - Forecast Network Capital Projects*, 28 March 2017, pp. 30-31

70 AER, *Information request to ElectraNet IR#001*, 7 April 2017.

71 HoustonKemp, *14133 ESCRI-SA – Economic assessment summary*, 14 June 2017.

- following approval of conditional grant funding from ARENA, the timing of the project had been brought forward in order to implement the project by the end of 2017
- the effect of advancing the timing of the Dalrymple project from the 2018–23 regulatory control period to the current regulatory control period would be offset through the deferral of specific, lower risk project works from the current period as a consequence of resource constraints on the delivery of substation projects.

On this basis, we consider that the Dalrymple energy storage project should be excluded from ElectraNet's total forecast capex for the 2018–23 regulatory control period. However, ElectraNet has identified specific capital works relating to projects previously scheduled to be wholly or substantially completed in the current period which, due to resourcing constraints, will now be deferred to the 2018–23 regulatory control period. These deferred capital works have a total value equivalent to the forecast capex for the Dalrymple energy storage project which will now be incurred in the 2013–18 regulatory control period.[72] We are satisfied that the resourcing constraints associated with bringing forward delivery of the Dalrymple energy storage project mean that deferring these other minor projects into the 2018–23 regulatory control period is likely to be prudent. We have therefore made no amendment to our estimate of total forecast capex in relation to the Dalrymple energy storage project, due to the impact of the offsetting capex deferrals from the current period. We expect that ElectraNet's revised proposal will account for the revised timing of both the Dalrymple energy storage project and the capital works deferred from the current period, in terms of both the total forecast capex and the individual asset categories of the PTRM and RFM.

Gawler East Connection Point

ElectraNet proposed forecast capex of $6.3 million for the Gawler East connection point project.[73] The Gawler East connection point project provides for the establishment of a new transmission network connection point at Gawler East to supply increased demand in the distribution network arising from new residential developments in the area. The proposed scope of work for the project involves establishment of a new 132/11 kV connection point substation by 2021 at Gawler East, between the existing Para and Roseworthy substations.[74]

The network constraint to be addressed by this project arises within the distribution network. AEMO's connection point forecasts (otherwise relied upon by ElectraNet in its capex forecasting methodology) do not capture the demand growth driving this

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72 ElectraNet, *Letter to the AER - Re: NCIPAP Amendment of Priority Projects*, 21 June 2017, pp. 5 and 7.

73 ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis. This reflects ElectraNet's forecast capex in real 2017-18 dollars using an estimate of expected inflation of 2.5 per cent.

74 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Appendix A - Forecast Network Capital Projects*, 28 March 2017, p. 32.

limitation.[75] The project is driven by SA Power Networks' demand forecasts for the Evanston substation which currently supplies the Gawler East region. The possible network options for this project include both distribution network only solutions as well as the joint distribution/transmission network option identified by ElectraNet.[76]

AEMO reviewed this project as part of its independent planning review of ElectraNet's proposed capex program. AEMO found that ElectraNet's proposal was reasonable and there is a need for the project if SA Power Networks' forecast for demand in the area eventuates. However, AEMO also found that:[77]

- the forecast demand growth at Gawler East is uncertain
- the year that the distribution network limitations are expected to arise (2022–23) is the last year of ElectraNet's forthcoming regulatory control period and is beyond SA Power Networks' current planning horizon
- consideration should be given to non-network options to defer the development of the Gawler East connection point, prior to committing to a network investment, to mitigate the risk of the new Gawler East connection point becoming a stranded asset
- the most economical solution should be confirmed through SA Power Networks' RIT-D analysis, which means the cost impact on ElectraNet is uncertain.

We reviewed SA Power Networks' latest (2016) distribution annual planning report (DAPR) in relation to the anticipated need for augmentation in the Gawler East region. SA Power Networks' 2016 DAPR states that:[78]

> Large scale residential developments are occurring in the Gawler region north of Adelaide where there is little or no distribution network. In 2014 we forecast the region would require a major network expansion, including the construction of a new zone substation. In conjunction with ElectraNet, we proposed to construct a new 132/11kV substation in the forward planning period with the RIT-D process planned to commence in late 2016. However, since then, development in the Gawler region has slowed. Based on our 2016 load forecast, it is now unlikely the Gawler East Substation will be required in the five-year forward planning period to 2020/21….The 2016 forecast indicates the "N" overload under 10% PoE conditions will now occur in 2023/24, six years later than forecast in the 2015 DAPR.

We sought additional information relating to the economic assessment undertaken by ElectraNet to justify the prudency and efficiency of the forecast capex for the Gawler East connection point project.[79] We also sought additional information on ElectraNet's

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75 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 10.

76 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Appendix A - Forecast Network Capital Projects*, 28 March 2017, p. 32.

77 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 10.

78 SA Power Networks, *Distribution Annual Planning Report 2016/17 to 2020/21*, 21 December 2016, pp. 34-35.

79 AER, *Information request to ElectraNet IR#001*, 7 April 2017.

options analysis for the project, and the project timing and interaction with SA Power Networks' RIT-D process, which we discussed further with ElectraNet staff at a workshop on 8 June 2017.[80]

ElectraNet provided a project cost estimate and economic model which set out a net present value (NPV) assessment of the quantified costs and benefits of each project option.[81] ElectraNet also submitted that:[82]

- SA Power Networks had recently reviewed and confirmed its demand forecast for the Gawler region
- a preliminary RIT-D analysis had concluded that the proposed 132/11 kV connection point option provided the highest net market benefit under all scenarios considered
- there is minimal opportunity for demand side management as this is a new load development, and generation support is not considered to be economic in this instance
- SA Power Networks will consider non-network options that may address the network constraint by formally seeking submissions from non-network providers on potential credible options as part of the formal RIT-D process.

We agree with AEMO that, based on SA Power Networks' current demand forecasts and preliminary options analysis it is reasonable for ElectraNet to consider that there may be a need for network augmentation in the Gawler East region towards the end of the 2018–23 regulatory control period. However, in our view there is significant uncertainty surrounding the need, timing, scope and cost of this project as proposed by ElectraNet. This is because:

- the need for this project is driven by SA Power Networks' demand forecast for the distribution network in the Gawler region. AEMO's connection point forecasts (otherwise relied upon by ElectraNet for capex forecasting) do not capture the demand growth driving the forecast constraints within the distribution system.
- recent changes to SA Power Networks' demand forecast in its 2016 DAPR deferred the timing of the forecast network constraint in the Gawler region by six years.[83] AEMO's independent planning review of ElectraNet's proposal noted that this highlights the difficulty of forecasting in an environment of rapid technological change, and concluded that the forecast demand growth at Gawler East is uncertain.[84]

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80 AER, *Addendum to Information request to ElectraNet IR#001*, 22 May 2017.

81 ElectraNet, *EC.14085 Cost Estimate Summary Report*, 12 April 2017; ElectraNet, *EC.14085 Gawler East Economic Model*, 13 April 2017.

82 ElectraNet, *Review of Economic Assessments - AER Briefing*, 8 June 2017, p. 9; ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Appendix A - Forecast Network Capital Projects*, 28 March 2017, p. 32.

83 SA Power Networks, *Distribution Annual Planning Report 2016/17 to 2020/21*, 21 December 2016, p. 35.

84 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 10.

- the project is subject to a RIT-D analysis to be undertaken by SA Power Networks. The RIT-D process has not yet commenced, as the forecast need for the project is beyond SA Power Networks' five year planning horizon.
- the RIT-D process will assess all potential options for addressing the forecast network constraint, including transmission, distribution and non-network options. While SA Power Networks and ElectraNet have undertaken a 'preliminary' options analysis, the preferred economic option for addressing future constraints in the distribution system at Gawler East has not yet been determined and the potential need for investment by ElectraNet is therefore uncertain.
- the RIT-D may identify a non-network or distribution network only option as the preferred economic solution for addressing the forecast constraint, in which case the scope of work and capex requirement for ElectraNet may be zero, or may be deferred beyond the 2018-23 regulatory control period.

In our view, we are not satisfied that the forecast capex for this project reflects the efficient costs that a prudent operator would require to achieve the capex objectives.[85] The Gawler East project might more appropriately be included as a contingent project in the 2018–23 regulatory control period, but it does not meet the contingent project materiality threshold.[86]

The project is driven by the extent and timing of additional customer load in a specific region, and is subject to confirmation of the need for network investment through a RIT-D process. AEMO's connection point forecasts (otherwise relied upon by ElectraNet for capex forecasting) do not capture the demand growth driving the forecast constraints within the distribution system. At this time, the scope and timing of required transmission network investment is uncertain, and the SA Power Networks' RIT-D process has not yet commenced. In the absence of a RIT-D analysis, the proposed option has not yet been confirmed as the most economical option to address the forecast distribution network constraint. The RIT-D analysis may identify a distribution network only solution as the preferred option. It is also not clear that full consideration has yet been given to efficient and prudent non-network options to defer development of the new connection point.[87] The market for such solutions will be formally tested through the RIT-D process.

For the reasons set out above, in modelling our alternative estimate of prudent and efficient capex requirements in the 2018–23 regulatory control period we have reduced ElectraNet's forecast load-driven capex by $6.3 million. We are satisfied that this adjustment is reasonably likely to reflect a prudent and efficient forecast of load-driven capex in the 2018–23 regulatory control period.

Table 6.7 summarises ElectraNet's proposal and our alternative estimate of forecast load driven capex.

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85 NER, cl. 6A.6.7(c)(1) and cl. 6A.6.7(c)(2).

86 NER, cl. 6A.6.7(e)(10).

87 NER, cl. 6A.6.7(e)(12).

Table 6.7 AER alternative estimate of ElectraNet's forecast load-driven capex ($2017–18, millions)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
ElectraNet's proposal[a]	13.9	2.8	5.1	0.0	0.0	21.9
AER alternative estimate	13.8	1.6	0.1	0.0	0.0	15.6

Source: ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis.

Note: [a] This reflects ElectraNet's forecast capex in real 2017-18 dollars using an estimate of expected inflation of 2.5 per cent as set out in Attachment 3 of this draft decision.

B.3 Forecast non-load driven network capex

ElectraNet's non-load driven capex consists primarily of asset replacement and refurbishment expenditure (repex), as well as expenditure related to security and compliance projects and inventory purchases. Repex involves replacing an asset or asset component with its modern equivalent where the asset has reached the end of its economic life. Economic life takes into account the age, condition, technology and operating environment of an existing asset. In general, we classify capex as repex where the expenditure decision is primarily based on the existing asset's inability to efficiently maintain its service performance requirement.

Position

We accept ElectraNet's forecast non-load driven capex of $383.8 million ($2017–18) as a reasonable estimate of forecast capex requirements for this category. This is a reduction of 26 per cent from actual and estimated capex for this category in the 2013–18 regulatory control period.

We are satisfied that ElectraNet's forecast of non-load driven capex reasonably reflects the capex criteria and the drivers of expenditure requirements in this category. ElectraNet's forecasting methodology, including the investment risk tool analysis used for the economic assessment of asset replacement and refurbishment decisions, is consistent with good industry practice and generally reflects reasonable inputs and assumptions. In coming to this view, as discussed in Appendix A, we applied:

- trend analysis, comparing past trends in total actual and forecast capex for the proposed non-load driven capex categories, and
- a methodology review of ElectraNet's expenditure forecasting methodology, including key inputs and assumptions, as applied by ElectraNet.

ElectraNet's revenue proposal

ElectraNet's forecast non-load driven capex is $383.8 million. This accounts for a large majority (84 per cent) of ElectraNet's total forecast capex. ElectraNet submitted that this expenditure has the following drivers:

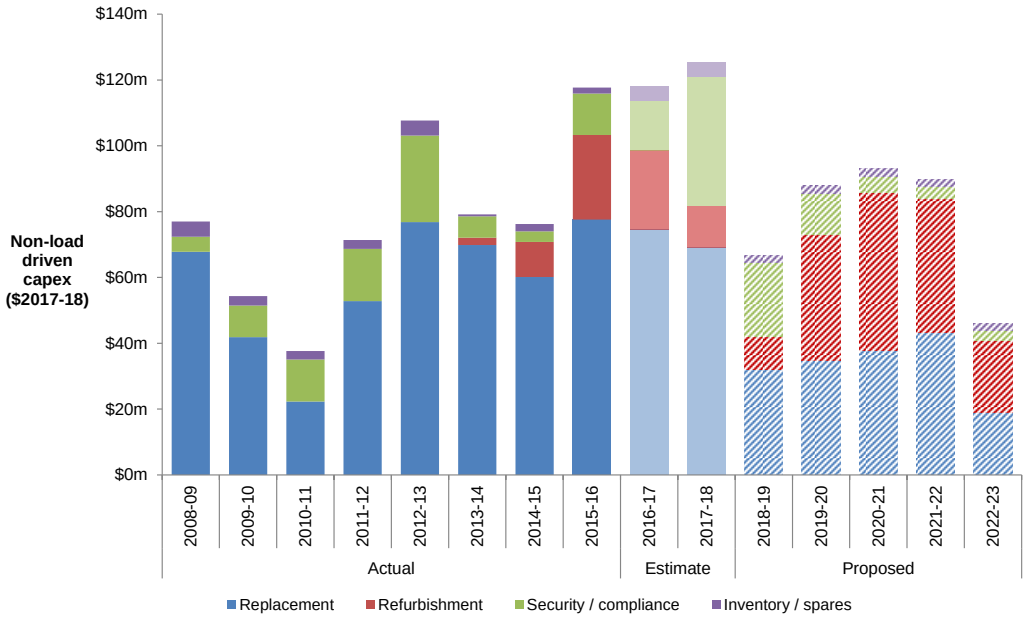
- for replacement and refurbishment capex, the need to extend the useful life of ageing transmission lines, manage network safety, security and reliability risk and contain escalating maintenance costs
- for security and compliance capex, following work undertaken in the 2013–18 regulatory control period, the need to improve the ability of the network to withstand extreme weather events and pursue targeted measures to address network security risks
- for inventory and spares capex, the need to replenish stock on an ongoing basis.

AER non-load driven capex findings

Historical and forecast non-load driven capex trends

We have conducted a trend analysis of non-load driven capex. The NER requires that we consider the actual and expected capital expenditure during any preceding regulatory control period.[88] Our use of trend analysis for non-load driven capex allows us to gauge how ElectraNet's historical non-load driven capex compares to its expected non-load driven capex for the 2018–23 regulatory control period. Figure 6.5 shows that ElectraNet's non-load driven capex has increased since 2010–11 and is expected to peak in 2017–18 before reducing in the 2018–23 regulatory control period.

Figure 6.5 ElectraNet's actual and forecast non-load driven capex ($million, 2017–18)



Source: ElectraNet, *Forecast Capital Expenditure Model*, March 2017; AER analysis, including updated actual and forecast inflation.

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

ElectraNet's forecast non-load driven capex is 26 per cent lower than actual and estimated non-load driven capex in the 2013–18 regulatory control period. However, the forecast non-load driven capex is approximately 10 per cent higher than actual expenditure in the 2008–13 regulatory control period.

An increasing or decreasing trend in total non-load driven capex does not, in and of itself, indicate that a service provider has proposed non-load driven capex that is likely to reflect or not reflect the capex criteria. In the case of ElectraNet, which has proposed a substantial decrease in non-load driven capex from the previous regulatory control period, we must nevertheless consider whether it has sufficiently justified that its proposed expenditure reasonably reflects the capex criteria. We use our trend analysis on key sub-categories, a methodology review, the views of stakeholders, and the material put forward by ElectraNet in support of its forecast, to help us form a view on whether ElectraNet has sufficiently justified its proposed total non-load driven capex.

Analysis of ElectraNet's forecast non-load driven capex trends at the sub-category level shows varying outcomes for different categories of expenditure. Replacement capex is forecast to reduce by approximately 52 per cent, which ElectraNet submitted is driven by a focus on component asset replacements with reduced need for large scale asset rebuilds.[89] This is partially offset by an increase in asset refurbishment capex, designed to extend the useful life of ageing assets and manage safety, security and reliability risks. The CCP identified this interplay between replacement and refurbishment expenditure in its submission. The CCP submitted that ElectraNet's proposal appeared to reflect a significant 'rebalancing' from replacement towards refurbishment expenditure, which the CCP considered to be an important contribution towards dynamic efficiency and a reflection of the uncertainty in future demand.[90]

ElectraNet has estimated that it will incur a historically high level of security and compliance capex in the final year of the 2013–18 regulatory control period in response to the network security issues experienced in 2016–17,. However this category is forecast to reduce substantially in the 2018–23 regulatory control period. ElectraNet submitted that it expects reduced requirements for security and compliance capex based on the work undertaken in the current period, with a focus on targeted measures to address network security risks.[91] We examined these specific network security measures as part of our project/program review, as discussed further below.

The final category of non-load driven capex, inventory and spares, is forecast to reduce slightly in the 2018–23 regulatory control period. Forecast capex in this category is expected to be steady across the period, reflecting a 'business as usual' approach to inventory purchases required to maintain an efficient level of spares to meet outage restoration times specified in the Electricity Transmission Code.[92]

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89 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 22.

90 Consumer Challenge Panel (Sub-Panel 9), *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017, pp. 29-30.

91 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 22.

92 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 43.

In relation to the 2013–18 regulatory control period, ElectraNet expects to underspend its total capex allowance by approximately 6 per cent. In our view, this suggests that ElectraNet has not systemically overestimated capex requirements in the current period. As we discussed in section , putting aside the significant and extreme weather related events of 2016, ElectraNet's past expenditure appears to have been sufficient to maintain the quality, reliability and security of supply of prescribed transmission services.

Based on our analysis of historical and forecast capex trends, we consider that ElectraNet's forecast non-load driven capex is lower than or in line with historical levels of expenditure, and appears consistent with the drivers of expenditure in this category.[93]

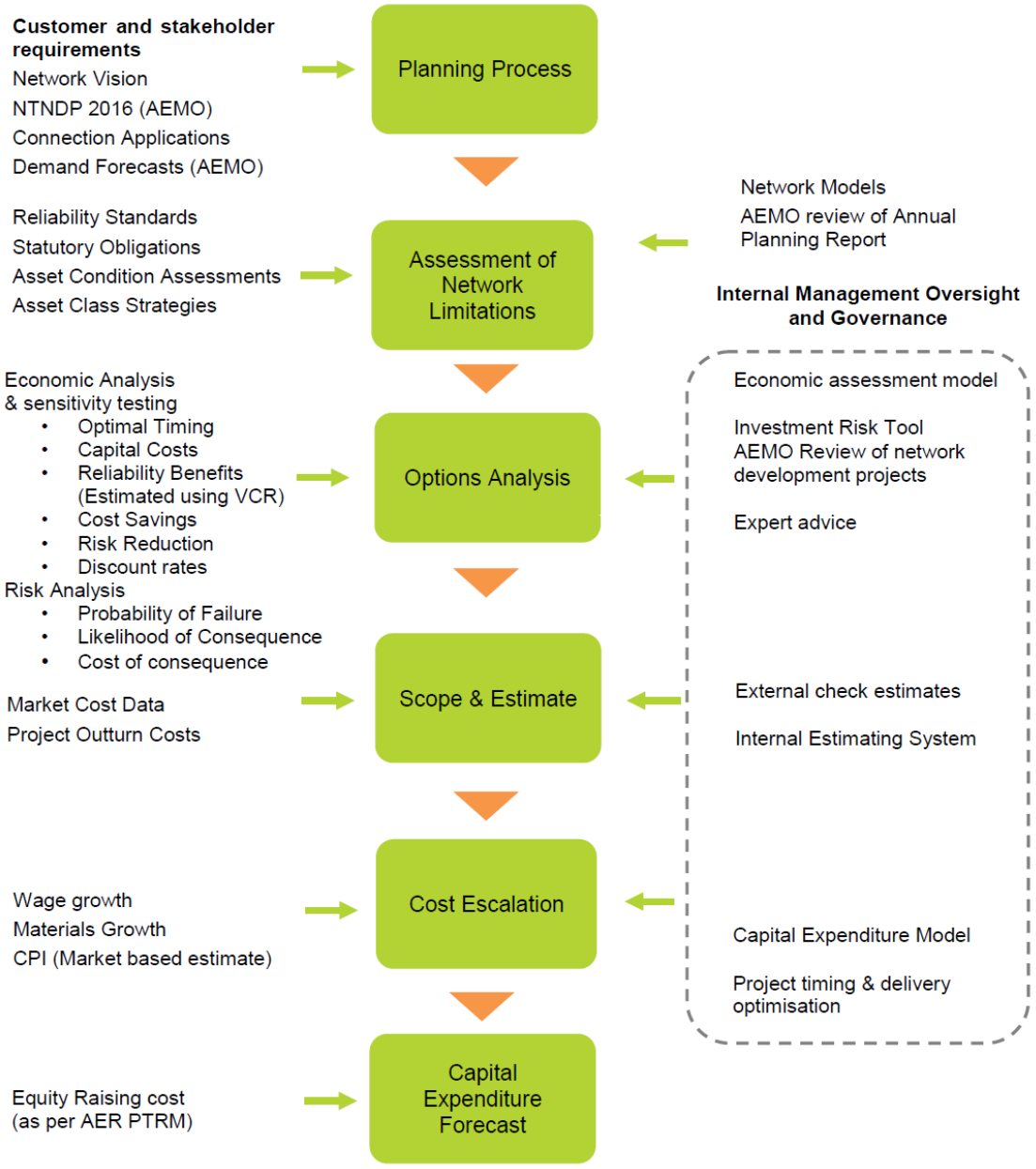
Forecasting methodology review

We have reviewed ElectraNet's expenditure forecasting methodology, including key input assumptions, to assess whether the resulting capex forecast reasonably reflects the capex criteria. In doing so, we have drawn on our internal technical expertise, as well as the information provided in ElectraNet's revenue proposal and submissions from stakeholders.

ElectraNet's capex forecasting methodology is illustrated in Figure 6.6 below.

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

Figure 6.6 ElectraNet's capital expenditure forecasting methodology



Source: ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 30.

The capex forecasting methodology used to develop ElectraNet's capex forecast is consistent with the methodology notified to us in June 2016.[94] ElectraNet has adopted a 'bottom-up' forecasting approach, meaning that ElectraNet's total forecast capex is an aggregate of individually planned projects and programs.[95] A 'bottom-up' forecasting approach can be problematic where a reasonable 'top-down' cross check of overall

[94] ElectraNet, *Expenditure Forecast Methodology 2018-19 to 2022-23*, June 2016.

[95] ElectraNet, *Expenditure Forecast Methodology 2018-19 to 2022-23*, June 2016, p. 10.

capex requirements is not also considered. As part of its forecasting methodology, ElectraNet optimises the timing and delivery of its overall capital program to ensure that it meets the capex objectives as efficiently as possible.[96]Our trend analysis showing that ElectraNet's forecast capex continues a historical trend of declining capex requirements also provides comfort that ElectraNet's forecasting methodology is likely to be reasonable.

ElectraNet's methodology reflects a risk based economic planning approach which we consider to be consistent with current good industry practice. Decisions to replace or refurbish an asset are driven by asset condition, risk and reliability considerations balanced against cost through an economic assessment of available options. The process set out by ElectraNet in Figure 6.6 and explained further in its revenue proposal and supporting documentation appears reasonable and likely to result in a forecast of capex requirements which reasonably reflects the capex criteria in the NER. This is because ElectraNet's methodology:

- captures the key drivers of investment need through a planning process and assessment of network limitations that takes into account:[97]
    - customer and stakeholder preferences
    - transmission licence, code and NER obligations
    - the condition and performance of existing assets, with regard to both the technical health and strategic importance of assets
    - planning and design standards
    - power system analysis and modelling of operational and network constraints.
- provides for the economic assessment of a reasonable range of options to address identified network limitations, including network, non-network and 'do nothing' options. These economic assessments account for:[98]
    - the capital and operating costs of alternative options
    - the quantified benefits of each option, including reliability and risk reduction benefits measured by a reduction in unserved energy or the quantified value of avoided risks (for example, safety and environmental risk)
    - the optimal timing of project options, including the possibility of deferral to a subsequent regulatory period
    - sensitivity testing of different scenarios to demonstrate the level of confidence in the assessment outcomes.
- determines project scope and cost estimates that:[99]

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96 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 30 and 40.
97 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 31-40.
98 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 36-37.
99 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 38-39.

- reflect outturn costs for similar projects and commercially determined market rates, noting that ElectraNet's capital program is delivered entirely through external contracting arrangements
- exclude any contingency for risk or real increases in the costs of materials
- are tested against external check estimates provided by engineering and estimating experts.

An important aspect of ElectraNet's capex forecasting methodology is the approach taken to risk analysis as part of the economic assessment of project options. For projects driven primarily by risk, ElectraNet's methodology provides for a detailed risk analysis which quantifies various categories of risk (for example safety, reliability and environmental risk) by considering:

- the probability of asset failure[100]
  - this is the likelihood that an asset will fail during a given period based on knowledge of asset condition, different failure modes and observed historical failure rates.
- the likelihood of adverse consequences[101]
  - this factor considers the probability that an asset failure will result in a particular consequence. Different consequences have different probabilities of occurring. The consequences of asset failure vary for different asset types and failure modes, but can include service interruption, bushfire, personal injury, repair costs, or environmental damage.
- the likely costs of the identified consequences[102]
  - this factor estimates the likely cost of each type of consequence, which can vary depending on severity or duration. For example, the cost of a service outage depends on the amount of load lost, the value of customer reliability (VCR) and the time taken to repair the failed asset.

ElectraNet's *Asset Risk Cost Modelling Guideline* explains at a high level how ElectraNet applies risk cost modelling to quantify the risk cost reduction benefit of replacement and refurbishment projects.[103] ElectraNet also provided an explanatory memorandum describing the specific inputs and assumptions to the risk analysis and the quantified outcomes for each relevant major project.

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[100] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 38; ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, pp. 11-14.

[101] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 38; ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, pp. 17-18.

[102] ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 38; ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, pp. 15-17.

[103] ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017.

Quantifying asset failure risk costs is complex, and relies upon many assumptions regarding the probabilities and costs of different risks in a range of scenarios. Importantly, ElectraNet has considered not only the likely consequences of asset failures but also the likelihood of those consequences actually occurring following an asset failure. Based on the information provided by ElectraNet through its revenue proposal and supporting documentation, we consider that the key inputs and assumptions that ElectraNet has applied to its risk assessments are generally reasonable and consistent with good industry practice, which continues to develop over time. For example:

- the framework used by ElectraNet to determine the probability of failure of individual asset types appears reasonable as it considers different asset failure modes, historical asset failure rates and actual asset condition (where known)[104]
- the likelihood of specific consequences occurring is estimated with regard to reasonable factors such as the system design, asset location, and the frequency in which the asset is visited[105]
- the likely costs of various possible consequences of asset failure have been estimated with regard to recognised external estimates where relevant, such as AEMO's estimates of the VCR and the Value of Statistical Life (VSL) set out in the Australian Government's Best Practice Regulation Guidance Note on the VSL.[106]

More broadly, we are also satisfied that the key inputs and assumptions applied by ElectraNet through its capex forecasting process are reasonable and consistent with good industry practice. For example, ElectraNet has:

- applied AEMO's independent South Australian connection point demand forecasts and estimates of the VCR
- considered a range of costs and discount rate assumptions in its project economic assessments
- considered the optimal timing of projects, and prioritised the delivery of its capex program
- estimated forecast labour price growth generally in accordance with our preferred methodology, as discussed in attachment 7 of this draft decision
- not included any risk contingency or real escalation of materials costs in its project cost estimates.

Application of ElectraNet's capex forecasting methodology

Having concluded that ElectraNet's capex forecasting methodology and key inputs and assumptions appeared reasonable and likely to result in a forecast of capex requirements which reasonably reflects the capex criteria in the NER, we sought to test

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[104] ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, pp. 10-14.
[105] ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, p. 17.
[106] ElectraNet, *Asset Risk Cost Modelling Guideline*, 27 March 2017, p. 16.

whether ElectraNet had consistently applied its capex forecasting methodology and assumptions in determining its proposed forecast capex for the 2018–23 regulatory control period.

In order to test ElectraNet's application of its capex forecasting methodology, we sought and reviewed supporting documentation for all major projects proposed by ElectraNet with costs greater than $5 million.[107] These 16 projects included examples related to all the major drivers of ElectraNet's forecast capex (augmentation, connection, replacement, refurbishment and security/compliance) and collectively accounted for 66 per cent of ElectraNet's forecast network capex.[108] Six of the projects had previously been discussed in detail during technical workshops attended by representatives of the Consumer Challenge Panel, ElectraNet's Consumer Advisory Panel Working Group, and the AER as part of ElectraNet's consumer engagement process.[109] AEMO also reviewed two of the projects as part of its independent planning review of ElectraNet's capex projects.[110]

ElectraNet submitted a range of supporting documentation for the proposed major capex projects, including economic assessments, risk analysis memoranda, project cost estimates, and independent check estimates.[111] ElectraNet explained that, for all large projects, it conducts an economic assessment to determine whether the benefits of undertaking the project exceed the costs, considering all feasible options. This assessment also examines the optimal timing of each project to ensure that net benefits are maximised, and projects are deferred where this is more economic.[112]

We reviewed the additional documentation submitted by ElectraNet in support of the major proposed capex projects. In general, we found that the documentation provided a reasonable level of comfort that the forecast capex for the proposed major projects was reasonably likely to reflect the efficient costs that a prudent operator would incur, having regard to a realistic expectation of forecast demand and cost inputs.

For each project, ElectraNet provided an economic model which contained a Net Present Value (NPV) assessment of the quantified costs and benefits for a range of project options.[113] These economic assessments had regard to:[114]

- the capital and operating costs of alternative options
- likely reliability benefits (reliability risk reduction) where the cost of unserved energy is measured by the VCR as estimated by AEMO

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107 AER, *Information request to ElectraNet IR#001*, 7 April 2017.

108 The list of major projects is in table 6.9 of ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 30.

109 ElectraNet, *Response to AER information request #001*, 19 April 2017.

110 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017.

111 ElectraNet, *Response to AER information request #001*, 19 April 2017, p. 8.

112 ElectraNet, *Response to AER information request #001*, 19 April 2017, p. 5.

113 ElectraNet, *Response to AER information request #001*, 19 April 2017, pp. 5 and 18-20.

114 ElectraNet, *Response to Addendum to AER information request #001*, 21 June 2017.

- potential cost savings, for example avoided maintenance costs
- risk reduction benefits, measured by the quantified value of various categories of risk reduced or avoided through the project, for example reduced safety and environmental risks
- a reasonable range of discount rate assumptions
- sensitivity analysis for various cost and benefit scenarios
- the optimal project timing, including the possibility of project deferral beyond the 2018–23 regulatory control period.

ElectraNet submitted a cost estimate for each project, produced by ElectraNet's estimating system based on a defined scope of works.[115] Depending on the stage of project development, ElectraNet's cost estimates were based on its database of materials and transmission construction costs, recent outturn costs for similar projects, and estimates from contractors and suppliers. The cost estimates reflected efficiencies expected to arise through combining the delivery of related projects. [116] Through our review of these cost estimates, we confirmed that ElectraNet had not included any contingencies in its forecast project costs. ElectraNet also provided 'check estimates' for a number of projects provided by independent experts who prepared their own estimates of project costs based on ElectraNet's identified project scope.[117] These check estimates provided some further assurance that ElectraNet's proposed project costs were reasonable and generally within the range of accuracy expected for project cost estimation.

ElectraNet also submitted a risk analysis memorandum for each project primarily driven by risk mitigation which described the specific inputs and assumptions to the risk analysis as well as the quantified outcomes.[118] This enabled us to review the input assumptions applied in ElectraNet's risk cost estimating analysis, the outcomes of which were in turn applied in the economic assessment of project options.

While we were generally satisfied that the project documentation submitted by ElectraNet demonstrated that it had applied its capex forecasting methodology and assumptions appropriately in determining its forecast capex requirements, we identified a number of specific issues in the documentation which we raised with ElectraNet. The issues we identified included:[119]

- inconsistent values for the VCR applied across different projects

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115 ElectraNet, *Response to AER information request #001*, 19 April 2017, pp. 6 and 17.

116 ElectraNet, *Response to AER information request #001*, 19 April 2017, p. 6; ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 32.

117 ElectraNet, *Response to AER information request #001*, 19 April 2017, pp. 6 and 17.

118 ElectraNet, *Response to AER information request #001*, 19 April 2017, pp. 6 and 17-18.

119 AER, *Addendum to Information request to ElectraNet IR#001*, 22 May 2017, pp. 1-4.

- in relation to the Eyre Peninsula line refurbishment projects, the inclusion of reliability risk costs in the economic analysis for scenarios where rectification works are required but there is no actual loss of supply
- a lack of justification for higher costs applied to reactive replacements, and double counting of some reactive replacement costs on certain projects
- hard coded numbers in the economic models, which made replicating or checking some input values difficult (for example, for estimates of risk likelihood and consequence)
- other minor data errors in the economic assessment models.

ElectraNet addressed these concerns through a workshop held with AER staff on 8 June 2017. ElectraNet also subsequently provided the presentation from this workshop, and updated economic assessment models for all major projects.[120] Through this process, ElectraNet made a number of amendments to its project risk analysis and economic models to correct for the errors and inconsistencies we had identified. This included applying a uniform estimate of the VCR across projects, removing double counted reactive replacement costs, and updating or correcting other inputs and errors across a number of project risk and economic assessments.[121] However, the net impact of these amendments was relatively minor and within the range of sensitivities tested for all projects, such that there was no change in the preferred economic option identified for any project. On this basis, we are satisfied that ElectraNet's supporting project documentation confirms that ElectraNet has consistently applied its capex forecasting methodology and input assumptions in determining its proposed forecast capex for the 2018–23 regulatory control period.

For the reasons set out above, we are satisfied that ElectraNet's forecast of non-load driven capex reasonably reflects the capex criteria and the drivers of expenditure requirements in this category. In this context, the following sections provide some additional commentary on a number of specific projects and programs, in response to submissions and advice received from stakeholders.

Eyre Peninsula line refurbishment project

The largest single project in ElectraNet's proposed capex forecast is the replacement of transmission line conductor and earth wire for specified sections of the 132kV line supplying the Eyre Peninsula, at a cost of approximately $74 million.[122]

The Eyre Peninsula is served by a 132 kV transmission line which runs from Cultana to Yadnarie to Port Lincoln. The original line to Port Lincoln was established in 1967. ElectraNet's most recent assessment of the condition of the line assets indicates that components of the line are nearing the end of their functional life and will require

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120 ElectraNet, *Response to Addendum to AER information request #001*, 21 June 2017.

121 ElectraNet, *Review of economic assessments - AER briefing*, 8 June 2017, pp. 3, 5-6, 8 and 10.

122 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, pp. 18-19.

replacement in the next few years. Current reliability standards require ElectraNet to provide back-up supply for Port Lincoln when supply from the 132 kV line is interrupted. Supply to Port Lincoln is supported by a network support agreement, under which ElectraNet is able to call upon the services of three diesel-fired gas turbines connected at Port Lincoln. The current network support agreement expires on 31 December 2018.[123]

In addition to the forecast capex for replacement of sections of the Eyre Peninsula 132kV transmission line, ElectraNet also proposed a contingent project which encompasses alternative options for investment which may be more cost effective and deliver greater benefits to consumers. The alternative options to be considered include full line replacement or augmentation through duplicating or uprating the line.[124] This contingent project is discussed further at appendix D.

We received a number of submissions regarding the Eyre Peninsula line refurbishment project and/or the related contingent project. The line refurbishment project was supported by a number of stakeholders, including the District Council for Lower Eyre Peninsula, Uniting Communities, Business SA and the Energy Division of the South Australian Department of the Premier and Cabinet.[125] There was further support from those same stakeholders for the Eyre Peninsula Reinforcement contingent project, as well as from Iron Road Pty Limited and the South Australian Chamber of Mines and Energy.[126] Overall, we have found a widespread recognition of a need for investment and general support for ElectraNet to address issues relating to supply reliability for customers on the Eyre Peninsula. However, some reservations were expressed by the CCP, which was concerned that the full and integrated consideration of the complex issues related to the Eyre Peninsula region may be lost in what appears to be a piecemeal approach. The CCP submitted that we should consider including the proposed ex ante capex for the Eyre Peninsula refurbishment project in the Eyre Peninsula Reinforcement contingent project.[127] Also, SACOSS did not support the Eyre Peninsula line refurbishment project, and submitted that the project should be deferred until there is evidence that failing to do this refurbishment work will have a significant and imminent impact on reliability and/or public safety.[128]

As discussed above, we are satisfied that ElectraNet's forecast non-load driven capex, which includes capex relating to the Eyre Peninsula line refurbishment project,

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123 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 18.

124 ElectraNet, *Revenue proposal 2019–23 - Attachment 6 - Capital Expenditure*, 28 March 2017, p. 19.

125 District Council of Lower Eyre Peninsula, *Submission on ElectraNet's Revenue Proposal 2018–23*, 2 August 2017; Uniting Communities, *Submission on ElectraNet's Revenue Proposal 2018–23*, July 2017; Business SA, *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017; and Government of South Australia, Department of the Premier and Cabinet, *Submission on ElectraNet's Revenue Proposal 2018–23*, 12 July 2017.

126 Iron Road Limited, *Submission on ElectraNet's Revenue Proposal 2018–23*, 7 July 2017, p. 1; South Australian Chamber of Mines and Energy, *Submission on ElectraNet's Revenue Proposal 2018–23*, 11 July 2017.

127 Consumer Challenge Panel (Sub-Panel 9), *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017, p. 37.

128 South Australian Council of Social Service, *Submission on ElectraNet's Revenue Proposal 2018–23*, 13 July 2017, p. 3.

reasonably reflects the capex criteria and the drivers of expenditure requirements in this category. ElectraNet's forecasting methodology, including the investment risk tool analysis used for the economic assessment of asset refurbishment decisions, is consistent with good industry practice and generally reflects reasonable inputs and assumptions.

The line refurbishment project is driven by ElectraNet's assessment of the quantified risk costs arising from the physical condition and expected failure rate of the line sections identified for refurbishment. ElectraNet has provided supporting documentation, including an investment risk analysis memorandum and economic model, which demonstrates that the forecast capex for the Eyre Peninsula refurbishment project is economically justified in the 2018–23 regulatory control period.[129] The project is required to meet the NER capex objectives of:[130]

- complying with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services, and
- maintaining the quality, reliability and security of supply of prescribed transmission services.

Alternative options for investment in the Eyre Peninsula region are under consideration as part of ElectraNet's *Eyre Peninsula Electricity Supply Options* RIT-T process, which will assess the costs and benefits of alternative network and non-network solutions. The alternative network options under consideration provide for the augmentation of the Eyre Peninsula transmission network to improve the quality, security and reliability of supply, subject to the identification of economic benefits that justify the additional cost.[131] In this context, the line refurbishment capex proposed by ElectraNet is the minimum level of investment that will be required in the 2018–23 regulatory control period to maintain the current quality, reliability and security of supply. We understand that the total decommissioning of the existing Eyre Peninsula radial transmission network (which would obviate the need for the proposed line refurbishment capex) is not feasible as the NER mandates the continuing connection of the existing Eyre Peninsula connection points to the South Australian transmission network.[132]

We do not consider that the inclusion of both the Eyre Peninsula line refurbishment project and the Eyre Peninsula Reinforcement contingent project in ElectraNet's revenue proposal represents a piece-meal approach to addressing the complex issues related to the Eyre Peninsula region. Completion of the current RIT-T process should provide evidence of a comprehensive and transparent assessment of credible options which demonstrates that any resulting network investment maximises net economic

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129 ElectraNet, *IR001-EC.14145,14137 Eyre Economic Model-20170614-v2-Confidential*; ElectraNet, *Eyre Peninsula Line Conductor and Earthwire Refurbishment - IRT Model Explanation Note* (Confidential), 21 June 2017.

130 NER, r. 6A.6.7(a).

131 ElectraNet, *Eyre Peninsula Electricity Supply Options - RIT-T Project Specification Consultation Report*, 28 April 2017, p. 6.

132 ElectraNet, *Eyre Peninsula Electricity Supply Options - RIT-T Project Specification Consultation Report*, 28 April 2017, p. 31.

benefits in the long term interests of consumers. As noted by the Energy Division of the Department of the Premier and Cabinet, the relative timing of the RIT-T process and the proposed refurbishment project is such that it allows for the proper consideration of alternative options, and also for the overlap of expenditure to be avoided.[133]

Should ElectraNet identify an alternative preferred option through the RIT-T process and successfully trigger the Eyre Peninsula Reinforcement contingent project, then ElectraNet is not obliged to complete the line refurbishment project as proposed. We do not determine which projects ElectraNet should or should not undertake. Once we approve total revenue, ElectraNet is able to prioritise its capex program given its circumstances over the course of the regulatory control period. Should ElectraNet identify an alternative preferred option through the RIT-T process and successfully trigger the Eyre Peninsula Reinforcement contingent project, we expect that:

- the line refurbishment project would not proceed as proposed
- the forecast capex allowed for the line refurbishment project would be applied to the preferred option for the Eyre Peninsula Reinforcement contingent project
- ElectraNet would apply to amend its revenue determination to recover only the differential in costs between the line refurbishment project and the preferred alternative investment option.

We have considered whether the forecast capex proposed by ElectraNet for the Eyre Peninsula refurbishment project should more appropriately be included as part of the Eyre Peninsula Reinforcement contingent project.[134] In our view, based on the information provided by ElectraNet, it appears certain that the forecast capex proposed by ElectraNet for this project is the minimum that will be required in the 2018–23 regulatory control period. The forecast capex therefore sits most appropriately within ElectraNet's ex-ante capex forecast. The Eyre Peninsula Reinforcement contingent project separately provides for any additional investment that may or may not be required, subject to the current RIT-T process identifying an alternative preferred investment option. Also, the inclusion of the forecast line refurbishment capex in ElectraNet's total forecast capex will provide for a smoother price path for consumers in the 2018–23 regulatory control period. Any future revenue adjustment required as a result of the Eyre Peninsula Reinforcement contingent project being triggered will be smaller than it otherwise would be if the line refurbishment capex was excluded from ElectraNet's total forecast capex and included in the contingent project.

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[133] Government of South Australia, Department of the Premier and Cabinet, *Submission on ElectraNet's Revenue Proposal 2018–23*, 12 July 2017, p. 3.

[134] NER, r. 6A.6.7(e)(10).

AEMO review of ElectraNet's capital expenditure projects

AEMO assessed 12 of ElectraNet's capex project proposals at the request of the South Australian Government as part of its South Australian advisory functions in accordance with section 50B of the NEL.[135]

AEMO found that 11 of the 12 projects it reviewed were appropriate for inclusion in ElectraNet's capex proposal, with the remaining project being not economically justified.[136] ElectraNet's capex proposal does not include the project which AEMO considered to be not economically justified. While AEMO found the remaining 11 projects to be appropriate for inclusion in ElectraNet's capex proposal, it did identify concerns with some projects which we have considered further in the course of our assessment of ElectraNet's forecast capex. These were:

- Gawler East connection point project: AEMO concluded that the forecast demand growth in Gawler East is uncertain and that the latest demand forecasts and non-network options should be considered prior to committing to a network investment to avoid the risk of building a stranded asset. The most economical solution should be confirmed through a RIT-D analysis.[137]
- Leigh Creek South transformer replacement: AEMO concluded that forecast demand at Leigh Creek South is uncertain and that consideration should be given to deferring the replacement if asset condition permits, to mitigate the risk of the new transformer becoming a stranded asset.[138]
- Mannum transformer 1 and 2 replacement: AEMO considered that the possibility of replacing the two existing transformers with smaller capacity transformers should be considered in detail prior to committing to an investment.[139]
- 50 MVAr reactor installations at Para, Blyth West and Templers West: AEMO noted that ElectraNet's proposed reactor installations appeared reasonable, but that the three reactor projects were interrelated and could be appropriately considered together through undertaking a RIT-T.[140]

We discussed the Gawler East connection point project in more detail in the load-driven capex section of this attachment. In relation to the other (non-load driven) projects listed above, we sought additional information from ElectraNet to address the issues raised by AEMO.[141] ElectraNet advised that:[142]

- the existing transformers at Leigh Creek South are 61 years old and present increasing environmental and safety risks. Deferral of the transformer replacement

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135 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017.
136 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 3.
137 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 23.
138 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 23.
139 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 23.
140 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 24.
141 AER, *Addendum to Information request to ElectraNet IR#001*, 22 May 2017.
142 ElectraNet, *Response to Addendum to AER information request #001*, 21 June 2017.

to the 2023–28 regulatory control period was considered but is not preferred on an economic basis when compared to ongoing risk and maintenance costs.

- for the Mannum transformer replacement project, ElectraNet has selected its standard transformer sizes to enable efficiencies in procurement, spares, engineering design and ability to be re-deployed. A smaller transformer size would offer minimal cost savings, which would be eroded by the other issues inherent in using a non-standard transformer size.
- for the three 50 MVAr reactor projects, ElectraNet advised that the Templers West project will be delivered in late 2018, but that efficiencies gained by conducting the three similar projects had already been taken into account in terms of reduced design costs for the latter two projects. ElectraNet is also preparing to conduct a RIT-T on main grid voltage levels, in the context of the *Main Grid System Strength* contingent project.

On the basis of the additional information provided by ElectraNet, we are satisfied that ElectraNet's forecast capex for the non-load driven capex projects assessed by AEMO is likely to be prudent and efficient and reasonably reflect the capex criteria.

B.4 Forecast non-network capex

The non-network capex category for ElectraNet includes expenditure on business information technology (IT) and facilities. Business IT capex includes projects to develop and maintain IT capacity and to improve the functionality of business systems to support business operation. Facilities capex includes projects to replace and upgrade office accommodation and services to meet business needs.[143]

Position

We are satisfied ElectraNet's forecast non-network capex reasonably reflects the capex criteria. We accept that ElectraNet's proposal for forecast non-network capex of $53.5 million ($2017-18)[144] reasonably reflects the efficient costs for non-network capex that a prudent operator would require to achieve the capex objectives.[145] This is comprised of $47.5 million for business IT capex and $5.9 million for facilities capex.

In modelling ElectraNet's allowed revenue for the 2018–23 regulatory control period, we have also accounted for forecast disposals of motor vehicle assets which ElectraNet omitted from its revenue proposal.

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[143] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 29.

[144] This reflects ElectraNet's forecast capex in real 2017–18 dollars using an estimate of expected inflation of 2.5 per cent, as discussed in Attachment 3 of this draft decision.

[145] NER, r. 6A.6.7(a).

Table 6.8 Draft decision on ElectraNet's total forecast non-network capex ($2017-18, million)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
ElectraNet proposal	16.0	9.1	10.5	10.5	7.2	53.4
ElectraNet proposal (CPI adjusted)	16.1	9.2	10.5	10.5	7.2	53.5
AER draft decision	16.1	9.2	10.5	10.5	7.2	53.5

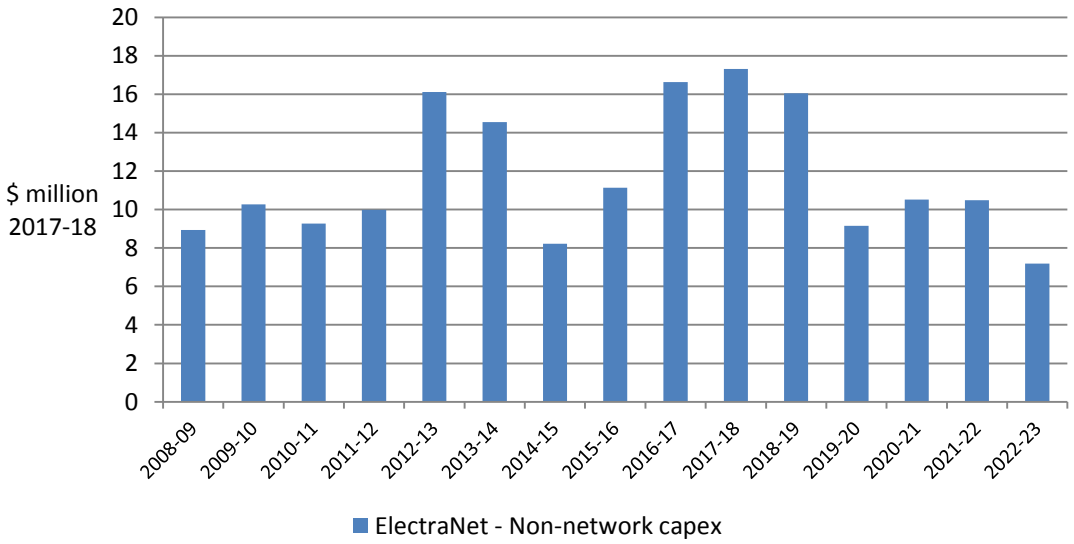
Source: AER analysis.

ElectraNet's proposal

ElectraNet proposed $53.5 million ($2017–18) for non-network capex in the 2018–23 regulatory control period, compared to $68.1 million ($2017-18) in the previous five year period.[146] The majority of the forecast non-network capex ($47.5 million or 89 per cent) is business IT capex.

Figure 6.7 shows ElectraNet's actual and expected non-network capex from 2008–09 to 2017–18, and forecast non-network capex for the 2018–23 regulatory control period.

Figure 6.7 ElectraNet's non-network capex ($2017-18)

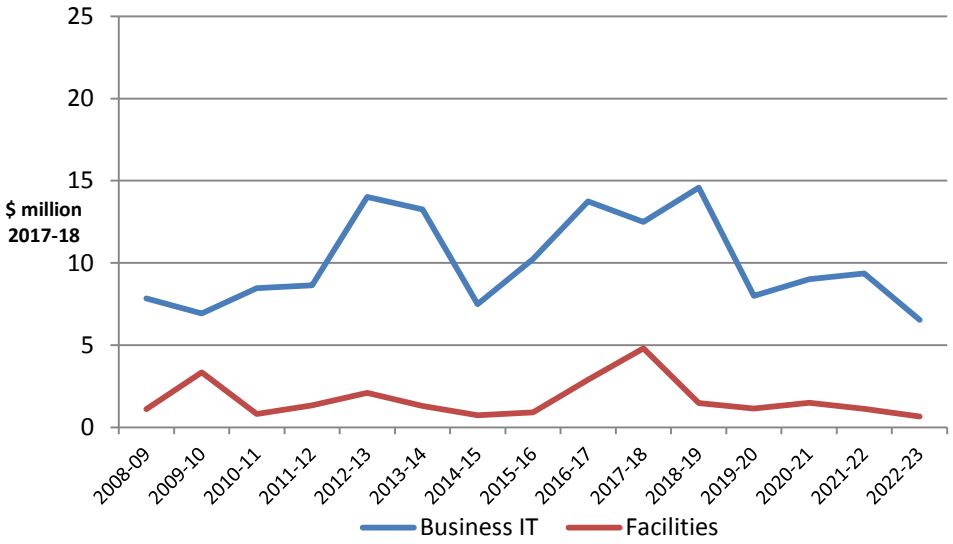


Source: ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15year View,* March 2017; AER analysis.

[146] ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15 year View,* March 2017.

ElectraNet's forecast non-network capex for the 2018–23 regulatory control period is, on average, 21.5 per cent lower per year than actual and expected non-network capex in the 2013–18 regulatory control period.[147] As Figure 6.7 shows, ElectraNet has forecast significantly more non-system capex in the first year of the 2018-23 regulatory control period ($16.1 million) compared to the other four years (average of $9.3 million) of the period. Our analysis shows that this is due to forecast capex on two business IT projects in particular (Energy Management System Functional Enhancement ($4.5 million) and Asset Management Optimisation ($2.8 million)).[148] Forecast facilities capex varies from $1.5 million in 2018-19 to $0.7 million in 2022-23.[149] Figure 6.8 shows ElectraNet's actual and forecast non-network capex by sub-category for the period from 2009 to 2023.

Figure 6.8 ElectraNet's non-network capex by category ($2017-18, million)



Source: ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15 year View,* March 2017; AER analysis.

Figure 6.8 shows that forecast facilities capex for the 2018-23 regulatory control period is consistent with historical facilities capex and significantly below the estimated facilities capex for the last two years of the current regulatory control period. On this basis, and given the relatively low forecast values for facilities capex in the 2018-23 regulatory control period (on average $1.2 million per year), we consider ElectraNet's forecast facilities capex is likely to reasonably reflect the efficient costs that a prudent

[147] ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15 year View,* March 2017; AER analysis.

[148] ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15 year View,* March 2017; AER analysis.

[149] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 43.

operator would require to meet the capex criteria.[150] However, given its materiality, we undertook a detailed review of the justification for ElectraNet's forecast business IT capex to confirm the need and timing of the forecast capex. We assessed ElectraNet's forecast capex using both trend analysis and individual project review where relevant. For example, we considered the investment lifecycle stage the business is in and its particular needs in the forthcoming period. We examined business cases and other supporting documentation provided by ElectraNet to assess whether the expenditure reasonably reflects the capex criteria. Our conclusions are summarised below.

Business IT capex

ElectraNet proposed $47.5 million ($2017–18) for business IT capex for the 2018–23 regulatory control period. This is a 17 per cent decrease below the actual and estimated $57.4 million business IT capex for the previous five years (2013–18).[151]

In its revenue proposal, ElectraNet provided a brief outline of its proposed business IT capex forecast describing it as a reduced program largely focused on ongoing replacement requirements and capex to develop and maintain its IT capacity and to improve the functionality of business systems.[152] However, we considered ElectraNet's proposal did not provide enough material to justify its proposed business IT capex forecast. Therefore, we sought further information from ElectraNet. This included evidence that the forecast IT capex program aligns with ElectraNet's overall IT strategy, and any available evidence which supports the prudency and efficiency of the forecast IT capex program or individual projects, such as project business case documentation or economic assessments.[153] In response to this request, ElectraNet provided additional information on its proposed IT capex including a summary of its business IT forecast, Business IT Plan and independent cost estimates and economic models for a number of proposed IT projects.[154]

In the additional business IT capex information provided, ElectraNet submitted that:

- the vast majority (98 per cent) of forecast business IT expenditure is related to recurrent expenditure. That is, expenditure that returns time after time based on standard business practice, technology lifecycles and vendor and business requirements. ElectraNet also submitted that the level of non-recurrent business IT expenditure fell from nine per cent based on the indicative forecasts contained in its preliminary revenue proposal, to a level of two per cent in its revenue proposal through the cancellation and deferral of IT projects as the forecast was finalised.[155]

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150 NER, cl. 6.5.7(c)(1).

151 ElectraNet, *Regulatory proposal, ENET063 - ElectraNet - Forecast Capital Expenditure Model - March 2017 - Public, template Capex 15 year View,* March 2017; AER analysis.

152 ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, pp. 22 and 43.

153 AER, *Information Request #002*, non-network capex documentation,12 May 2017.

154 ElectraNet, *Response to AER information request #002,* 23 May 2017.

155 ElectraNet, *Response to AER information request #002*, 23 May 2017, p. 5.

- a significant proportion (around 25 per cent comprising 12 projects) of the business IT capex forecast consists of well advanced projects that are due for completion in the forecast period including the Energy Management System Functional Enhancement and Asset Management Optimisation projects. ElectraNet forecast capex of $4.4 million (out of a total capex of $7.7 million) for the EMS Functional Enhancement project to be incurred in the 2018-23 regulatory control period.[156]
- economic assessments for seven IT projects totalling $15.2 million were undertaken to review available options, costs, benefits, and optimal timing to determine the most efficient solution to meet the identified requirements, and ensure that any investment maximises the net benefit to customers[157]
- in order to validate the accuracy of its costings, ElectraNet obtained independent check estimates for a sample of its proposed IT projects from independent IT experts, Think180. ElectraNet reported that the review by Think 180 showed that the variations in its cost estimates were within the range of accuracy expected of business IT cost estimates for these projects. ElectraNet also submitted that based on Think 180's check estimate for the Archive and Optimise SAP Data project, this project was subsequently removed from ElectraNet's business IT capital expenditure forecast for the 2018–23 regulatory control period as it was determined that the need for this project could be efficiently avoided.[158]

ElectraNet's claim that 98 per cent of its forecast business IT expenditure is related to recurrent expenditure is supported by the financial data shown in its summary of business IT projects to be undertaken during the 2018-23 regulatory control period presented in section 5.2 Program Overview of its Business IT Plan.[159] We also compared the forecast costs for the two projects included in Think 180's check estimates (Refresh Database Platform and ERP Systems Refresh) with the costs shown for these projects in ElectraNet's Business IT Plan and consider ElectraNet's claim that variations in its cost estimates are within the range of accuracy expected of business IT cost estimates for these projects to be reasonable.[160]

On the basis of our review of the additional business IT capex information provided by ElectraNet, we consider that ElectraNet's proposed business IT capex is necessary to achieve the capex objectives of the NER. We therefore accept ElectraNet's proposed forecast business IT capex of $47.5 million ($2017-18) reasonably reflects the efficient costs that a prudent operator would require to achieve the capex objectives.[161]

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156 ElectraNet, *Response to AER information request #002*, 23 May 2017, p. 7.

157 ElectraNet, *Response to AER information request #002*, 23 May 2017, p. 8.

158 ElectraNet, *Response to AER information request #002*, 23 May 2017, p. 9; Think 180*, ElectraNet Pty Ltd , IT Reset (4) Costing Estimation - SAP Upgrades (Public)*, November 2016.

159 ElectraNet, *Response to AER information request #002, Business IT Plan 2018-19 to 2022-23*, May 2017, p. 12.

160 ElectraNet, *Response to AER information request #002, Business IT Plan 2018-19 to 2022-23*, May 2017, p. 12.

161 NER, r. 6A.6.7(a).

Motor vehicle asset disposals

ElectraNet did not account for any disposals of motor vehicle assets in its revenue proposal. In assessing ElectraNet's forecast non-network capex, we sought further information regarding ElectraNet's forecast disposals of motor vehicle assets in the 2018–23 regulatory control period.[162]

In response to our information request, ElectraNet advised that it expected proceeds from the sale of motor vehicle assets over the 2018–23 regulatory control period of $0.9 million.[163] We have accounted for these disposals in modelling ElectraNet's allowed revenue for the 2018–23 regulatory control period.

[162] AER, *Information Request #002, non-network capex documentation*, 12 May 2017.

[163] ElectraNet, *Response to AER information request #002*, 23 May 2017.

C Demand

ElectraNet has produced demand forecasts to help determine its forecast capex. We have reviewed ElectraNet's demand forecast in order to determine whether or not the proposed capex reasonably reflects a realistic expectation of 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 ElectraNet 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 which may, once any spare capacity in the network is used up, lead to a requirement for augmentation capex or 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.

In our consideration of ElectraNet's demand forecast, we had regard to:

- ElectraNet's proposal
- Independent demand forecasts from the Australian Energy Market Operator (AEMO),[164] and
- stakeholder submissions in response to ElectraNet's proposal.

C.1 AER draft decision

We are satisfied that ElectraNet's demand forecast reasonably reflects a realistic expectation of demand over the 2018–23 regulatory control period. In determining a realistic expectation of demand over the 2018–23 period, we have had regard to the following factors:

- ElectraNet's capex forecast was based on 10 per cent Probability of Exceedance (PoE) maximum demand and 90 per cent PoE minimum demand forecasts independently published by AEMO
- ElectraNet's connection point level demand forecasts were obtained from SA Power Networks, while forecasts for large directly connected transmission customers were obtained from AEMO
- ElectraNet's demand forecast shows a continuation of the recent actual demand trend of a decline in operational consumption and maximum demand in South Australia, and
- ElectraNet's recognition of the growing penetration of intermittent renewable energy.

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ElectraNet's reduced maximum demand forecast has substantially eliminated the need for augmentation capex for the 2018-23 regulatory control period.

C.2 ElectraNet's proposal

In determining its capital expenditure forecast, ElectraNet submitted that it adopted the state-wide 10-year medium case 10 per cent PoE maximum demand forecast and 90 per cent PoE minimum demand forecasts published by AEMO. ElectraNet also submitted that its connection point level demand forecasts were obtained from SA Power Networks, while forecasts for large directly connected transmission customers were obtained from AEMO. [165]

ElectraNet stated that AEMO's latest South Australian demand forecasts indicated that:[166]

- in the medium term (2015–16 to 2025–26), operational consumption is forecast to decline, continuing the trend that started in 2010–11. This decline is attributed to projected lower residential consumption and flat business consumption, as a result of forecast high uptake in rooftop photovoltaic (PV) and ongoing energy efficiency improvements
- in the short term between 2015–16 to 2018–19, flat operational consumption is forecast, driven by a projected recovery in industrial consumption from assumed stabilising economic conditions in the neutral scenario, offset by rooftop PV uptake, energy efficiency savings, and the exit of the automotive industry
- maximum demand is expected to continue to decline, driven by rooftop PV, energy storage, and energy efficiency improvements (as shown in Figure 6.9 below)
- by the end of 2026–27, continued uptake of PV is projected to result in negative minimum demand under certain conditions leading to net exports from the distribution network to the transmission grid in aggregate, and ultimately from the region during those periods.

Figure 6.9 AEMO summer operational maximum demand forecasts for South Australia 2015-16 to 2025-26 (MW)

Summer	Actual	10 per cent POE	50 per cent POE	90 per cent POE
2015-16	2,895	3,158	2,823	2,534
2016-17		3,081	2,753	2,489
2017-18		3,038	2,714	2,427

[165] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, pp. 33-34.

[166] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 34.

2018-19	3,034	2,656	2,421
2019-20	2,928	2,599	2,370
2020-21	2,878	2,569	2,360
2021-22	2,805	2,487	2,294
2022-23	2,756	2,460	2,279
2023-24	2,734	2,435	2,254
2024-25	2,693	2,421	2,202
2025-26	2,639	2,396	2,202

Source: ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 34.

ElectraNet submitted that AEMO has reduced its maximum demand forecasts for South Australia compared to the forecasts it prepared in 2015. ElectraNet stated that the significant reduction in demand forecasts has practically eliminated the need for augmentation capex in the forthcoming regulatory period.[167] ElectraNet also submitted that the changing pattern of generation and demand on its network, including the declining minimum demands noted by AEMO, raises important issues regarding the resilience of the network. In particular, ElectraNet stated that it expects issues associated with South Australia's growing penetration of intermittent renewable energy to be an important driver of its future capital expenditure requirements such as voltage control requirements on the network driven by more complex power flows.[168]

C.3 AER assessment of ElectraNet's forecast

We consider that a demand forecasting methodology should reflect realistic expectations of demand. We consider that AEMO's terminal station demand forecasts, which ElectraNet has adopted, reflect a realistic expectation of demand for ElectraNet's network because it is based on a consistent and well established forecasting methodology. Further, AEMO's forecast of actual and maximum demand is consistent with the long term underlying demand trend which occurred on ElectraNet's network historically. This trend showed a decline in operational consumption and maximum demand in South Australia, consistent with AEMO's and ElectraNet's demand forecasts. The forecast reduction in maximum demand has led to a substantial reduction in proposed augmentation capex for the 2018-23 regulatory control period.

[167] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 35.
[168] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 35.

We also note that ElectraNet has recognised the growing penetration of intermittent renewable energy. This recognition has impacted on its future capex requirements.

Submissions

We received submissions from the Consumer Challenge Panel (CCP), Uniting Communities and Business SA on ElectraNet's demand forecasts for the 2018-23 regulatory control period.

The CCP agreed with ElectraNet's decision to adopt the forecasts provided by AEMO given AEMO's experience and independence, particularly given the uncertainties around the growth in non-network generation including residential and commercial PV and battery technologies.[169] The CCP recommended that we accept ElectraNet's forecast of consumption and peak demand for the 2018-23 regulatory control period regulatory period.[170]

Uniting Communities submitted that as they are less certain about local and regional variation in loads, they consider that the trigger events proposed by ElectraNet for each proposed contingent project are possible, maybe probable during the 2018-23 regulatory control period. [171]

Business SA stated that they welcomed ElectraNet's step of assuming output growth of zero per cent, against an output change averaging 0.44 per cent using weightings from the AER's consultant benchmarking analysis.[172]

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169 Consumer Challenge Panel Sub-Panel 9, *Submission to ElectraNet - Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report*, 21 July 2017, p. 26.

170 Consumer Challenge Panel Sub-Panel 9, *Submission to ElectraNet - Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report*, 21 July 2017, p. 28.

171 Uniting Communities, *Submission on ElectraNet 2018-23 Revenue Proposal,* July, 2017, p. 14.

172 Business SA, *Submission on ElectraNet 2018-23 Revenue Proposal*, 6 July 2017, p. 2.

D Contingent projects

ElectraNet proposed between $630 million to $950 million for five contingent projects for the 2018–23 regulatory control period.[173] ElectraNet submitted the proposed projects are probable or plausible to occur by 2023.[174]

The five proposed contingent projects are:[175]

- Eyre Peninsula Reinforcement ($200 million)
- South Australian Energy Transformation ($200-500 million)
- Upper North-East Line Reinforcement ($60 million)
- Upper North-West Line Reinforcement ($110 million)
- Main Grid System Strength Support ($60-80 million)

ElectraNet submitted that the proposed Eyre Peninsula Reinforcement project may deliver sufficient benefits to customers to outweigh the additional costs by improving supply reliability to customers in the region, avoiding the ongoing annual costs of network support at Port Lincoln and reducing network losses.[176]

ElectraNet identified the following needs in respect to the South Australian Energy Transformation project:[177]

- facilitating greater competition in the wholesale electricity market to lower dispatch costs, and consequently wholesale electricity prices, particularly in South Australia (market need)
- providing appropriate security of supply, including inertia, frequency response and system strength services in South Australia (security need), and
- facilitating the transition to lower carbon emissions and the adoption of new technologies (emissions need).

In respect of the two load related projects (Upper North-East and Upper North-West Line Reinforcement), ElectraNet submitted that the proposed contingent projects would be reasonably required to meet the NER capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations.[178]

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173 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6: Capital Expenditure*, 28 March 2017, pp. 47-48.
174 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017.
175 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017.
176 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 4.
177 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 8.
178 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, pp. 11 and 14.

ElectraNet submitted that the requirement for the Main Grid System Strength Support project is to maintain minimum fault levels in South Australia for foreseeable operating conditions above a level that is sufficient to ensure that:[179]

- power electronic interfaced devices such as wind turbines and static Var compensators can remain stable
- protection systems can adequately function, and
- voltage can be maintained during normal system and market operations including switching transformers, transmission lines and reactive plant, transformer tap changing and routine variations in load or generation.

Generally, contingent projects are significant network augmentation projects that are reasonably required to be undertaken in order to achieve the capex objectives. However, unlike other proposed capex projects, the need for the project within the regulatory control period and the associated costs are not sufficiently certain. Consequently, expenditure for such projects does not form a part of the total forecast capex that we approve in this determination. Such projects are linked to unique investment drivers (rather than general investment drivers such as expectations of load growth in a region) and are triggered by defined 'trigger events'. The occurrence of the trigger event must be probable during the relevant regulatory control period.[180]

If, during the regulatory control period, ElectraNet considers that the trigger event for an approved contingent project has occurred, then it may apply to us. At that time, we will assess whether the trigger event has occurred and the project meets the threshold. If satisfied of both, we would determine the efficient incremental revenue which is likely to be required in each remaining year of the regulatory control period as a result of the contingent project, and amend the revenue determination accordingly.[181]

D.4 Position

D.2.1 Position on contingent projects

We consider that ElectraNet's proposed contingent projects should be classified as contingent projects for the 2018–23 regulatory control period. These projects may be reasonably required to be undertaken in order to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for transmission services over the 2018–23 regulatory control period.

The trigger events for the proposed contingent projects are generally appropriate. The projects will be triggered by the successful completion of a RIT-T process, and our determination that the preferred option of the proposed investment satisfies the RIT-T. For the two load related contingent projects, an additional requirement will be that

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179 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 17.

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

181 NER, cl. 6A.8.2.

customer commitment for additional load to connect to ElectraNet's 132kV transmission line will exceed defined thermal limits of the lines. For the Main Grid System Strength Support project, an additional requirement is confirmation by AEMO of the existence of a Network Support and Control Ancillary Services gap relating to system strength, or any other requirement for ElectraNet to address a system strength requirement in the South Australian region.

Our review of the requirements for each proposed contingent project is set out in section D.3 below.

D.2.2 Review of trigger events

ElectraNet's proposed trigger events for each contingent project have three common elements:

- the successful completion of a RIT-T
- determination by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T, and
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the NER.

In addition, as discussed above, the two load related contingent projects also require a customer commitment for additional load that will exceed the defined thermal limits of ElectraNet's 132kV transmission lines. Further, the Main Grid System Strength Support project also requires confirmation by AEMO of the existence of a requirement for ElectraNet to address a system strength requirement.

Broadly, we consider these triggers are appropriate because they are specific and verifiable, in particular:

- the successful completion of a RIT-T process may demonstrate that a project is reasonably necessary in order to achieve the capex objectives and reasonably reflects the capex criteria
- a determination by us that the preferred option satisfies the RIT-T will provide greater surety that the cost and scope of the proposed contingent project will satisfy the capex objectives and capex criteria
- the commitment of additional load that will require an upgrade of capacity will likely increase costs in a specific location due to additional load requiring capacity upgrades, and
- confirmation by AEMO of the existence of a requirement for ElectraNet to address a system strength requirement is verifiable.

However, for us to be satisfied with these common trigger events, we require ElectraNet to amend the wording of the project triggers to remove reference to the

determination being made ‘under clause 5.16.6 of the NER’. We acknowledge this approach differs to recent determinations.[182] While we consider clause 5.16.6 is useful in setting out a process and timeframe for the AER to make such a determination, the operation of clause 5.16.6 excludes projects driven by the need for reliability corrective action. We consider that this trigger should be amended to the following:

- determination by the AER that the proposed investment satisfies the RIT-T.

This change would ensure that all contingent projects triggered by RIT-T processes are subject to this trigger. A discussion on the basis for this amendment is presented below.

Inclusion of RIT-T in trigger events

As noted above, the successful completion of a RIT-T is an important step to ensure that the capex for a project is required to achieve the capex objectives and reasonably reflects the capex criteria. Completion of the RIT-T process provides evidence of a comprehensive and transparent assessment of credible options which demonstrates that the proposed network investment maximises net economic benefits. We propose to continue to apply this trigger for ElectraNet's proposed contingent projects.

The second RIT-T trigger event, requiring a determination 'under clause 5.16.6 of the NER' that the preferred investment option satisfies the RIT-T, has also previously been included in our revenue determinations and has been included by ElectraNet for all its proposed contingent projects. Clause 5.16.6 of the NER provides for TNSPs to request that we make a determination that the preferred investment option satisfies the RIT-T and sets out the process and timeframe for us to make such a determination. It is not mandatory for the TNSP to seek such a determination, and TNSPs may only request such a determination where the preferred option is not for reliability corrective action. However, where a RIT-T process is used as a contingent project trigger, we consider it is appropriate for us to review the TNSP’s application of the RIT-T process in a manner akin to the mechanism provided by clause 5.16.6.

We consider there is merit in removing the specific reference to clause 5.16.6 of the NER from contingent project triggers going forward. While clause 5.16.6 is useful in setting out a process and timeframe for us to make a determination that the preferred investment option satisfies the RIT-T, the operation of clause 5.16.6 is limited to circumstances where the preferred option is not for reliability corrective action. Removing the reference to clause 5.16.6 of the NER from contingent project triggers would ensure that all contingent projects triggered by RIT-T processes are subject to this trigger, which will add to the rigour of the contingent project assessment process.

[182] See for *example,* AER, *Powerlink transmission draft determination 2017-22, Attachment 6 - Capital expenditure*, September 2016, p. 6-79.

D.1 Assessment approach

We reviewed each of ElectraNet's proposed contingent projects against the assessment criteria in the NER.[183] We considered whether:

- the proposed contingent project is reasonably required to be undertaken in order to achieve any of the capex objectives[184]
- the proposed contingent project capital expenditure is not otherwise provided for in the capex proposal[185]
- the proposed contingent project capital expenditure reasonably reflects the capex criteria, taking into account the capex factors[186]
- the proposed contingent project capital expenditure exceeds the defined threshold[187] and
- the trigger events in relation to the proposed contingent project are appropriate.[188]

ElectraNet's revenue proposal included details for each proposed contingent project.[189] ElectraNet's revenue proposal included a description of each contingent project, proposed trigger events, project requirement, proposed capex and demonstration of rules compliance. We sought and ElectraNet provided us with additional information in respect to its proposed contingent projects.[190] ElectraNet's responses addressed our concern that its revenue proposal did not contain sufficient information to support the need for the contingent projects or specific trigger events.

ElectraNet acknowledged that the need, cost or timing of its proposed contingent projects is currently uncertain, and so it was not possible to undertake detailed business case assessment or economic evaluation when it submitted its revenue

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183 NER, cl. 6A.8.1.

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

185 NER, cl. 6A.8.1(b)(2)(i). Relevantly, a TNSP must include forecast capex in its revenue 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)).

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

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

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

189 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017.

190 ElectraNet, *Response to AER Information Request #001*, 19 April 2017 and AER, *Information request #004*, 26 June 2017. Document relevant to proposed contingent projects in response to AER Information Request #001 included *ElectraNet-IR001-Response Summary Document-20170419-Public.* Documents relevant to proposed contingent projects in response to AER Information Request #004 included; *ElectraNet_IR004_Contingent Projects_20170626 - Public*, *ElectraNet_IR004_SAET-Supplementary-Information-Paper-Final_13022017 - Public*, *ElectraNet_IR004_Report-SouthAustralianTransmissionAnnualPlanningReport_30062016 - Public*, *ElectraNet_IR004_Report-SouthAustralianEnergyTransformationPSCR-1_26112016 - Public*, *ElectraNet_IR004_Report-SAETRIT-T-MarketModellingApproachandAssumptionsReport_21122016 - Public*, *ElectraNet_IR004_Report-EyrePeninsulaElectricitySupplyOptionsPSCR_28042017 - Public* and *ElectraNet_IR004_Electricity-TransmissionCode-TC09_26062017 - Public*.

proposal.[191] ElectraNet submitted, however, that evidence of the planning and assessment undertaken in relation to its proposed contingent projects that further supports their inclusion as being reasonably required to be undertaken in order to achieve the capital expenditure objectives of the National Electricity Rules, was provided in response to our initial information request.[192] ElectraNet submitted that for each project it will conduct RIT-T.[193] ElectraNet also submitted that all of its proposed contingent projects have either been reviewed by or are based on triggers from AEMO.[194]

We reviewed each project based on ElectraNet's and our own analysis. Given the uncertainty about the timing and requirements for each project, at this stage, it is not necessary to assess the costs and technical scope of each project in detail. Rather, we reviewed whether each contingent project is reasonably likely to be required in the 2018–23 regulatory control period based on the materiality and plausibility of the trigger conditions. This gives us a high-level view of whether each project is reasonably required to be undertaken in the regulatory control period in order to achieve any of the capex objectives and reflect the capex criteria.

We also considered whether the proposed trigger events for each project are appropriate. This includes having regard to the need for the trigger event:

- to be reasonably specific and capable of objective verification[195]
- to be a condition or event which, if it occurs, makes the project reasonably necessary in order to achieve any of the capex objectives[196]
- to be a condition or event that generates increased costs or categories of costs that relate to a specific location rather than a condition or event that affects the transmission network as a whole[197]
- to be described in such terms that it is all that is required for the revenue determination to be amended[198] and
- to be a condition or event, the occurrence of which is probable during the 2018–23 regulatory control period but the inclusion of capex in relation to it (in the total forecast capex) is not appropriate because either:

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191 ElectraNet, *Response to AER Information Request #001*, *ElectraNet-IR001-Response Summary Document-20170419-Public*, 21 April 2017, p. 11.

192 ElectraNet, *Response to AER Information Request #001*, *ElectraNet-IR001-Response Summary Document-20170419-Public*, 21 April 2017, p. 11.

193 ElectraNet, *Response to AER Information Request #004*, *ElectraNet_IR004_Contingent Projects_20170626 - Public*, 26 June 2017, p. 6.

194 ElectraNet, *Response to AER Information Request #001*, *ElectraNet-IR001-Response Summary Document-20170419-Public*, 21 April 2017, p. 11.

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

196 NER, cl. 6A.8.1(c)(2).

197 NER, cl. 6A.8.1(c)(3).

198 NER, cl. 6A.8.1(c)(4).

- it is not sufficiently certain that the event or condition will occur during the regulatory control period or if it may occur after that period or not at all, or
- assuming it meets the materiality threshold, the costs associated with the event or condition are not sufficiently certain.[199]

D.2 ElectraNet proposal

As noted above, ElectraNet has proposed five contingent projects as part of its proposal. Table 6.910 below summarises the contingent projects proposed by ElectraNet, for the 2018–23 regulatory control period. For each contingent project, the table sets out:

- the indicative contingent capex amount, typically provided as a range estimate
- 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 6.9 ElectraNet proposed contingent projects

Contingent Project	Contingent Capex ($m)	Brief Project Description	Load Trigger	RIT-T Trigger
Eyre Peninsula Reinforcement	$200m[a]	Augment supply to the Eyre Peninsula to improve supply reliability, avoid ongoing network support costs, and enable new customer connections.	N	Y
South Australian Energy Transformation	$200 to $500m	The South Australian component of a project to increase interconnection between South Australia and the Eastern states.	N	Y
Upper North-West Line Reinforcement	$110m	Rebuild the Pimba 132kV line and establish associated substation assets to meet expected customer demand.	Y	Y
Upper North-East Line Reinforcement	$60m	Reinforce the Leigh Creek 132 kV line and establish associated substation assets to meet expected customer demand.	Y	Y
Main Grid System Strength Support	$60 to $80m	Upgrade existing protection devices and install synchronous condensers at selected locations to maintain power system strength in South Australia.	N	Y

Source: AER analysis.

Note: [a] The net total of contingent capex for this project is approximately $120 million, when ex-ante capex for the refurbishment of lines on the Eyre Peninsula is excluded.

[199] NER, cl. 6A.8.1(c)(5).

Impact of contingent projects on residential customer bills

The CCP submitted that we should include the probable impact of contingent projects on revenues and prices in our draft determination.[200] ElectraNet calculated the indicative average annual residential customer bill impact of the two proposed contingent projects for which it has commenced RIT-T processes.[201]

For the Eyre Peninsula Reinforcement project ($120 million), ElectraNet has determined an indicative average annual residential customer bill impact of about $4 from the time of project commissioning. For the SAET project ($250 million), ElectraNet has identified an indicative average annual residential customer bill impact of about $8 from the time of the project commissioning.[202]

In our view, it is not possible for us to provide a more meaningful assessment of the probable impact of contingent projects on revenues and prices because:

- the scope and costs of contingent projects are uncertain (typically projects have a range of potential costs for different project scopes)
- the timing of potential expenditure within the regulatory control period (if any) is unknown
- different project options can reflect different splits between capex and opex, and between different asset classes
- the actual change in demand which might trigger a contingent project and also influence prices is unknown.

D.3 Contingent project assessments

In summary we have accepted the proposed contingent projects but have amended the trigger events for each project as outlined in Table 6.10.

Table 6.10 Summary of amended contingent project triggers

Contingent project	AER amended triggers
Eyre Peninsula Reinforcement	1. Successful completion of the RIT-T including an assessment of credible options identifying the duplication or replacement of the existing Cultana to Yadnarie and/or Yadnarie to Port Lincoln transmission lines as the preferred option. 2. Determination by the AER that the proposed investment satisfies the RIT-T. 3. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.
South Australian Energy Transformation	1. successful completion of the South Australian Energy Transformation RIT-T with the identification of a preferred option or options: (a) demonstrating positive net market benefits; and/or

[200] CCP (Sub-Panel 9), *Submission on ElectraNet's Revenue Proposal 2018–23*, 5 July 2017, p. 37.

[201] ElectraNet, *Revenue Proposal 2019–23 - Attachment 1- Maximum Allowed Revenue*, 28 March 2017, p. 16.

[202] ElectraNet, *Revenue Proposal 2019–23 - Attachment 1- Maximum Allowed Revenue*, 28 March 2017, p. 16.

Contingent project	AER amended triggers
	(b) addressing a reliability corrective action. 2. Determination by the AER that the proposed investment satisfies the RIT-T. 3. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.
Upper North-East Line Reinforcement	1. Customer commitment for additional load to connect to the transmission network causing the Davenport to Leigh Creek 132kV line to exceed its thermal limit of 10 MVA. 2. Successful completion of the RIT-T including an assessment of credible options showing a new connection point and line upgrade is justified. 3. Determination by the AER that the proposed investment satisfies the RIT-T. 4. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.
Upper North-West Line Reinforcement	1. Customer commitment for additional load to connect to the transmission network causing the Davenport to Pimba 132kV line to exceed its thermal limit of 76 MVA. 2. Successful completion of the RIT-T including an assessment of credible options showing a transmission investment is justified. 3. Determination by the AER that the proposed investment satisfies the RIT-T. 4. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.
Main Grid System Strength Support	1. Confirmation by AEMO of the existence of a NSCAS gap relating to system strength, or other requirement for ElectraNet to address a system strength requirement, in the South Australian region. 2. Successful completion of the RIT-T (or equivalent economic evaluation) including an assessment of credible options showing a transmission investment is justified. 3. Determination by the AER that the proposed investment satisfies the RIT-T. 4. ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

Source: AER analysis.

D.3.1 Eyre Peninsula Reinforcement

ElectraNet submitted that detailed condition assessment indicates that significant lengths of conductor on the Cultana to Yadnarie and Yadnarie to Port Lincoln 132 kV lines are in poor condition, and are likely to experience a significantly increased rate of failure in future years. ElectraNet therefore included the costs of replacing the sections of conductor that are in poor condition on these lines in its ex ante capital expenditure forecast for the 2018-23 regulatory control period. ElectraNet considered, however, that it is possible that the full replacement or augmentation of the line may deliver sufficient benefits to customers to outweigh the additional costs by improving supply reliability to customers in the region, avoiding the ongoing annual costs of network support at Port Lincoln and reducing network losses. ElectraNet submitted that this

would involve replacing the existing radial Cultana to Yadnarie and Yadnarie to Port Lincoln 132 kV lines with, for example, new double-circuit 132 kV or 275 kV lines.[203]

ElectraNet submitted that it will also continue to work with the Essential Services Commission of South Australia (ESCOSA) as the responsible body for setting transmission reliability standards in South Australia as it undertakes a review of the applicable reliability standard for the Eyre Peninsula for the South Australian Treasurer and Minister for Energy.[204] We note that, in its draft report for this review, ESCOSA has concluded that it does not intend to amend the transmission network exit point reliability standards that will apply from 1 July 2018.[205]

ElectraNet proposed $200 million for this project based on an indicative 132 kV double circuit line option. ElectraNet submitted that if required, this project would also consider incorporating any associated works that may be justified to reinforce or improve the resilience of the network from the nearest nodal substation at Davenport. ElectraNet also submitted that if this contingent project were to be triggered, it would seek only the differential capital expenditure (currently estimated at $120m) that would be required to undertake full line replacement as an alternative to the partial line replacement projects included in its capex proposal.[206]

ElectraNet proposed the following trigger events for this contingent project:[207]

- successful completion of the RIT-T including an assessment of credible options identifying the duplication or replacement of the existing Cultana to Yadnarie and/or Yadnarie to Port Lincoln transmission lines as the preferred option
- determination (if applicable) by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

AER considerations

We consider that the Eyre Peninsula Reinforcement project (net $120 million) may be reasonably required to be undertaken in order to achieve the capital expenditure objectives. However, we consider that the trigger events should be amended in order for us to be satisfied that each trigger event is appropriate.

We accept the Eyre Peninsula Reinforcement project as a contingent project because the project may reasonably be required to be undertaken in order to meet or manage

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[203] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 4.
[204] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 5.
[205] Essential Services Commission of South Australia, *Inquiry into the reliability and quality of electricity supply on the Eyre Peninsula - draft report*, 31 May 2017, p. 20.
[206] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 5.
[207] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 4.

expected demand or to maintain the reliability or security of supply, based on the following:[208]

- the reported condition assessment of significant lengths of conductor on the Cultana to Yadnarie and Yadnarie to Port Lincoln 132kV transmission lines and the potential consequences of failure of these conductors[209]
- recent concerns raised by Eyre Peninsula community members about the customer impacts arising from the level of reliability and quality of supply in the region,[210] and
- the significant deterioration in the reliability of electricity supply performance during 2016-17, due to the severe weather events on 9 September 2016, 28 September 2016 and 23 December 2016 and the impact of such interruptions on ElectraNet's ability to achieve the transmission reliability standards under the Electricity Transmission Code.[211]

We consider that the RIT-T process currently underway will provide for an assessment of all credible options and determine a preferred approach, which we will then review to verify that any proposed investment satisfies the RIT-T.

As set out in section D.2.2, we consider that ElectraNet's proposed trigger of a determination by us under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T should be amended by removing the reference to clause 5.16.6 of the NER. Therefore, for us to be fully satisfied that this project should be included as a contingent project, ElectraNet should amend its trigger events to include:

- a determination by the AER that the proposed investment satisfies the RIT-T.

Submissions

We received a number of submissions in support of ElectraNet's proposed Eyre Peninsula Reinforcement contingent project. A number of submissions acknowledged the recent reliability issues on the Eyre Peninsula, while others endorsed reinforcement of ElectraNet's transmission lines on the Eyre Peninsula to support mining and other developments in the region. A summary of these submissions is presented below.

Table 6.11 Submissions on ElectraNet's Eyre Peninsula Reinforcement contingent project

Stakeholder	Issue
Australian Energy	In its review of ElectraNet's proposed capital expenditure projects, AEMO assessed

[208] NER, cl. 6A.8.1(b)(1).

[209] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 4.

[210] Essential Services Commission of South Australia, *Inquiry into reliability and quality of electricity supply on the Eyre Peninsula - draft report*, May 2017, p. 1.

[211] Essential Services Commission of South Australia, *Inquiry into reliability and quality of electricity supply on the Eyre Peninsula - draft report*, May 2017, p. 1.

Stakeholder	Issue
Market Operator	ElectraNet's Eyre Peninsula Reinforcement contingent project and associated trigger events.[212] AEMO stated that rebuilding the existing Cultana – Yadnarie – Port Lincoln 132 kV lines into double circuit lines is likely to have net market benefits. AEMO supported including this project as a contingent project so that ElectraNet can carry out detailed assessment of this option.[213]
Business SA	Although Business SA did not address ElectraNet's proposed Eyre Peninsula contingent project specifically, it supported ElectraNet's endeavours to improve reliability on the Eyre Peninsula, not only to Port Lincoln but also to northern customers situated within South Australia's largest single grain growing region. Business SA submitted that the blackout events experienced recently highlighted the vulnerability of Port Lincoln customers which were particularly exposed given businesses expected the city's backup generators to provide support in the event of a network failure.[214]
South Australian Chamber of Mines and Energy	The South Australian Chamber of Mines and Energy (SACOME) supported the need for contingent projects that can react promptly to development triggers. In particular, SACOME considered there is a need for reinforcement of the Eyre Peninsula transmission line from 132kV to 275kV to support mining and other developments in the region. SACOME considered that the Central Eyre Iron Project will likely be developed during the 2018-23 regulatory control period. SACOME submitted that the load requirement of 500MW for this project is sufficient to justify an upgrade of the Cultana to Yadnarie and Yadnarie to Wudinna lines. SACOME stated that a further two projects in the region are in feasibility and approvals stages and could potentially receive final investment decisions during the 2018-23 regulatory control period.[215]
Essential Services Commission of South Australia	On 31 May 2017, ESCOSA released its draft findings and recommendations into its inquiry into the reliability and quality of electricity supply on the Eyre Peninsula.[216] The inquiry was referred to ESCOSA by the South Australian Treasurer on 9 March 2017 following concerns raised by Eyre Peninsula community members about the customer impacts arising from the level of reliability and quality of supply in the region.[217] Although ESCOSA reviewed five transmission network reliability improvement options proposed by ElectraNet, including those consistent with ElectraNet's proposed contingent project, ESCOSA considered that the evaluation of the full benefits of ElectraNet's options, including non-reliability benefits, was beyond the scope of its inquiry and were to be addressed in the ElectraNet's RIT-T process. ESCOSA concluded that it does not intend to amend the Eyre Peninsula transmission network exit point reliability standards that will apply from 1 July 2018.[218]
Iron Road	Iron Road Limited, developer of the Central Eyre Iron Project on the Eyre Peninsula, submitted that it supports ElectraNet's proposed contingent project for the Eyre Peninsula reinforcement. Iron Road submitted that full replacement of the Cultana to Port Lincoln transmission line is preferable to the alternative option of conductor replacement on the existing 132kV transmission line. Iron Road considered that this is unlikely to

212 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

213 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

214 Business SA, *Submission on ElectraNet 2018-23 Revenue Proposal*, 6 July 2017, p. 4.

215 South Australian Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.

216 Essential Services Commission of South Australia, *Inquiry into reliability and quality of electricity supply on the Eyre Peninsula - draft report*, May 2017.

217 Essential Services Commission of South Australia, *Inquiry into reliability and quality of electricity supply on the Eyre Peninsula - draft report Executive Summary*, May 2017, p. 1.

218 Essential Services Commission of South Australia, *Inquiry into reliability and quality of electricity supply on the Eyre Peninsula - draft report*, May 2017, pp. 12-13 and 20.

Stakeholder	Issue
	meet the future needs of Eyre Peninsula communities in terms of supply reliability and necessitates ongoing costs in Port Lincoln for generation support.[219]
Consumer Challenge Panel (CCP)	The CCP submitted that we should form a view on the most appropriate governance arrangements for the path forward for Eyre Peninsula's electricity infrastructure, noting concerns raised by the ESCOSA in relation to joint planning of distribution and transmission networks. The CCP suggested that this could include rejecting ElectraNet's ex-ante capex proposal and including this expenditure in the scope of the Eyre Peninsula Reinforcement contingent project.[220] The CCP also provided us with a copy of its submission to ElectraNet in respect to ElectraNet's Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report.[221] The CCP restated its position in its submission to us that we should reject ElectraNet's ex-ante proposal for capital expenditure and include this expenditure in the scope of the Eyre Peninsula Reinforcement contingent project.[222]
Uniting Communities	Uniting Communities submitted they are aware of concerns that exist in parts of the community about contingent projects happening outside of the full scrutiny of a regulatory process and believe that contingent projects should be minimised. However, Uniting Communities submitted that they accept that ElectraNet's circumstances make predictions about weather and even shifting demand out to 2023 difficult. Uniting Communities supported the RIT-T process as an effective way of engaging with consumers. Uniting Communities submitted that there is uncertainty regarding local and regional variations in loads, and as a consequence consider that the trigger events proposed by ElectraNet for each proposed contingent project are possible, maybe probable during the 2018-23 regulatory control period.[223] Uniting Communities submission is relevant for all proposed contingent projects.
South Australian Department of the Premier and Cabinet	The South Australian Department of Premier and Cabinet (SADPC) supported the inclusion of an ex-ante capex project to partially replace transmission lines on Eyre Peninsula as well as the Eyre Peninsula Electricity Supply Options contingent project to explore alternatives through a formal RIT-T. The SADPC considered that the proposed timing of the partial replacement projects allows for proper consideration of alternatives and also for the overlap of expenditure to be avoided. The SADPC submitted that given the prospect of increased load due to mining, including two recent government approvals for Iron Road's Central Eyre Iron Project, it considers that using the conclusion of the RIT-T process as a trigger for ElectraNet's contingent project is appropriate and that the timing of the RIT-T will accommodate the results of the ESCOSA inquiry and emerging demand requirements.[224]
District Council of Lower Eyre Peninsula	The District Council of Lower Eyre Peninsula submitted that it welcomes an upgrade of ElectraNet's transmission lines on Eyre Peninsula, although it is concerned about the ageing electricity infrastructure and significant power outages that have occurred regularly across Eyre Peninsula recently. The Council requested that ElectraNet consider providing a dual circuit 275kV line as the spine of the Eyre Peninsula network to allow for future industry development, but managed as a 132 kV line unless demand

219 Iron Road Limited, *Submission on ElectraNet 2018-23 Revenue Proposal*, 7 July, 2017.

220 Consumer Challenge Panel Sub-Panel 9, *Submission to the Australian Energy Regulator - Response to proposals from ElectraNet for a revenue reset for the 2018-23 regulatory period*, 12 July 2017.

221 Consumer Challenge Panel Sub-Panel 9, *Submission to ElectraNet - Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report*, 21 July 2017.

222 Consumer Challenge Panel Sub-Panel 9, *Submission to ElectraNet - Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report*, 21 July 2017, p. 9.

223 Uniting Communities, *Submission on ElectraNet 2018-23 Revenue Proposal,* July, 2017, pp. 12-14.

224 Government of South Australia, Department of Premier and Cabinet, *Submission on ElectraNet 2018-23 Revenue Proposal*, 12 July 2017.

Stakeholder	Issue
	warrants instigation of the full 275kV capacity. The Council also requested that a minimum dual circuit 132kV transmission line be provided to Eyre Peninsula.[225]

Source: AER analysis.

D.3.2 South Australian Energy Transformation

ElectraNet's South Australian Energy Transformation (SAET) proposed contingent project involves increased interconnection to the Eastern states via a new interconnector with a notional capacity of 650 MW, together with associated works required (e.g. synchronous condensers, special protection schemes, dynamic reactive support) combined with non-network solutions.[226] On 7 November 2016, ElectraNet commenced the SAET RIT-T by publishing a Project Specification Consultation Report (PSCR) in order to meet the following identified needs as prescribed by the NER:[227] [228]

- facilitating greater competition in the wholesale electricity market, to lower dispatch costs and consequently wholesale electricity prices, particularly in South Australia ('market need')
- providing appropriate security of supply, including inertia, frequency response and system strength services in South Australia ('security need'), and
- facilitating the transition to lower carbon emissions and the adoption of new technologies ('emissions need').

ElectraNet reported that options highlighted in the PSCR include new interconnectors between South Australia and neighbouring eastern states and alternative solutions that do not involve an interconnector, such as demand response, generation options, battery storage and other solutions (a non-interconnector solution).[229] To support this work, the South Australian Government contributed $0.5 million towards the costs of ElectraNet pursuing a feasibility study into increased interconnection between South Australia and the Eastern states.[230]

ElectraNet submitted that the South Australian component of the proposed contingent project has an indicative cost estimate in the order of $200m to $500m. ElectraNet stated that this estimate is based on the construction of a new double circuit 275 kV transmission line from Robertstown in South Australia to Buronga in New South Wales, including associated works such as static VAR compensators, synchronous condensers, and a Special Protection Scheme. ElectraNet also submitted it is also possible that the outcome of the RIT-T process determines that a combination of

[225] District Council of Lower Eyre Peninsula, *Submission on ElectraNet 2018-23 Revenue Proposal*, 21 June 2017.
[226] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 7.
[227] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 8.
[228] NER cl 5.16.4(b)(2).
[229] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 8.
[230] News releases - Premier Jay Weatherill, *State Budget 2016/17: Study into new interconnector*, 14 June 2016.

supporting network investments (e.g. synchronous condensers, special protection schemes, and dynamic reactive support) combined with non-network options is found to be part of the most economical solution identified through the RIT-T.[231]

ElectraNet proposed the following trigger events for this proposed contingent project:[232]

- successful completion of the SAET RIT-T with the identification of a preferred option or options:
    - demonstrating positive net market benefits, and/or
    - addressing a reliability corrective action
- determination (if applicable) by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

AER considerations

We consider that the SAET project ($200 to $500 million) may be reasonably required to be undertaken in order to achieve the capex objectives. However, we consider that the trigger events should be amended in order for us to be satisfied that each trigger event is appropriate.

We accept the SAET project as a contingent project because it may reasonably be required to be undertaken in order to maintain the quality, reliability and security of supply or of the transmission system, and meet or manage the expected demand for network services, based on the following:[233]

- system security is likely to be maintained (or improved) by reducing the risk of widespread loss of supply in the circumstance where South Australia becomes islanded from the NEM through the loss of the Heywood interconnector
- increased access to a more diverse range of electricity generation sources, enabling greater sharing of energy reserves across regions and improving supply security for South Australia, and
- increasing the potential for more renewable generation, thereby enabling Australia to meets its renewable energy targets.

We consider that the RIT-T process currently underway will provide for an assessment of all credible options and determine a preferred approach, which we will then review to verify that any proposed investment satisfies the RIT-T.

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231 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 9.

232 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, pp. 7-8.

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

On 14 March 2017, the South Australian government released its Energy Plan. Aspects of this plan have the potential to impact on the outcomes of the SAET RIT-T. For this reason, ElectraNet is currently engaging with government and undertaking analysis to better understand the potential implications for the SAET RIT-T.[234] ElectraNet is also engaging with non-network option proponents that provided consultation feedback to obtain additional technical and cost information about their proposals so that an initial assessment of the feasibility and likely benefits of non-network solution options can be progressed. The outcomes of the ElectraNet PSCR will define the preferred option for the reinforcement of the South Australian network.

As set out in section D.2.2, we consider that ElectraNet's proposed trigger of a determination under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T should be amended by removing the reference to clause 5.16.6 of the NER. Therefore, for us to be fully satisfied that this project should be a contingent project, ElectraNet should amend its trigger events to include:

- a determination by the AER that the proposed investment satisfies the RIT-T.

Submissions

We received a number of submissions in support of ElectraNet's proposed SAET contingent project. A summary of these submissions is presented below.

Table 6.12 Submissions on ElectraNet's South Australian Energy Transformation contingent project

Stakeholder	Issue
Australian Energy Market Operator	In its review of ElectraNet's proposed capex projects, AEMO assessed ElectraNet's SAET contingent project and associated trigger events.[235] AEMO stated that high level modelling carried out as part of its 2016 National Transmission Network Development Plan suggested positive net benefits for potential interconnection developments. AEMO supported including this project as a contingent project.[236]
South Australian Department of the Premier and Cabinet	The SADPC agreed with the project justification and with the outcome of a RIT-T forming an appropriate trigger. The SADPC noted that the 2016-17 State Budget allocated $0.5 million towards the RIT-T to explore options for greater energy interconnection with the eastern states.[237]

Source: AER analysis.

[234] ElectraNet, *South Australian Energy Transformation* (https://www.electranet.com.au/projects/south-australian-energy-transformation/.

[235] AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

[236] AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

[237] Government of South Australia, Department of Premier and Cabinet, *Submission on ElectraNet 2018-23 Revenue Proposal*, 12 July 2017.

D.3.3 Upper North-East Line Reinforcement

ElectraNet submitted that it has received a number of load connection enquiries in the vicinity of the Davenport to Leigh Creek 132kV line due to interest in mineral exploration and resource development in the area.[238] ElectraNet submitted that to support any material additional loads, a major up-rating or rebuilding of the line would be required from Davenport to the point where the new load is connected.[239]

The existing Davenport to Leigh Creek transmission line was designed with a thermal rating of 49 °C, which has been shown to be inadequate for Australian summer conditions. ElectraNet submitted that although most circuits designed and built to this standard have been uprated or replaced, the Davenport to Leigh Creek line continues to have an adequate rating for the magnitude of the load it supplies at Neuroodla, the Leigh Creek coal mine and Leigh Creek township. As a result, uprating or replacement has not been necessary to date. ElectraNet stated that aerial laser survey data shows that, assuming the structures are mechanically capable, the connection of a 35 MW load at Leigh Creek would require the uplifting of some 300 of the total 600 spans in the existing line over its 240km length to meet minimum ground clearance requirements. Any step load increase causing the line to exceed its thermal limit of 10 MVA would require either a significant uprating or the rebuild of the line.[240]

This contingent project is estimated to cost $60 million. ElectraNet submitted that this estimate is based on the uprating of some 300 spans of the Davenport to Leigh Creek 132kV line, establishment of a 132/33 kV substation, and plant and protection systems at both remote ends of the lines. ElectraNet's estimate included associated integration, telecommunication SCADA and metering works.[241]

ElectraNet proposed the following trigger events for this contingent project:[242]

- customer commitment for additional load to connect to the transmission network causing the Davenport to Leigh Creek 132kV line to exceed its thermal limit of 10 MVA
- successful completion of the RIT-T including an assessment of credible options showing a new connection point and line upgrade is justified
- determination by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

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238 ElectraNet, Response to AER Information Request #001, *ElectraNet-IR001-Response Summary Document-20170419-Public*, 21 April 2017, pp. 12-13.

239 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 10.

240 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 11.

241 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 11.

242 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 11.

AER considerations

We consider that the Upper North-East Line Reinforcement ($60 million) may be reasonably required to be undertaken in order to achieve the capital expenditure objectives. However, we consider that the trigger events should be amended in order for us to be satisfied that each trigger event is appropriate.

We accept the Upper North-East Line Reinforcement project as a contingent project because the project may reasonably be required to be undertaken in order to efficiently meet expected demand for prescribed transmission services, based on the following:

- the likelihood, based on connection enquiries, that there will be an increase in demand from resource development and mining activity in the upper north-east region of South Australia during the 2018-23 regulatory control period, and
- the likelihood that if there was an increase in resource development and mining activity in the upper north-east region of South Australia resulting in a step load increase in demand, the Davenport to Leigh Creek 132kV line would exceed its thermal limit of 10 MVA and require either a significant uprating or rebuild.

We consider that the RIT-T process will provide for an assessment of all credible options and determine a preferred economic approach, which we will then review to verify that any proposed investment satisfies the RIT-T.

As set out in section D.2.2, we consider that ElectraNet's proposed trigger of a determination by us under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T should be amended by removing the reference to clause 5.16.6 of the NER. Therefore, for us to be fully satisfied that this project should be a contingent project, ElectraNet should amend its trigger events to include:

- a determination by the AER that the proposed investment satisfies the RIT-T.

Submissions

We received a number of submissions in support of ElectraNet's proposed Upper North-East Line Reinforcement contingent project. A summary of these submissions is presented below.

Table 6.13 Submissions on ElectraNet's Upper North-East Line Reinforcement contingent project

Stakeholder	Issue
Australian Energy Market Operator	In its review of ElectraNet's proposed capital expenditure projects, AEMO assessed ElectraNet's Upper North-East Line Reinforcement contingent project and associated trigger events.[243] AEMO stated that the existing Davenport to Leigh Creek 132kV line

[243] AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

Stakeholder	Issue
	needs to be augmented if there is a step load growth which results in the total load exceeding 5 MW.[244]
Leigh Creek Energy	Leigh Creek Energy submitted that reinforcement of the Upper North East Line will ensure a reliable source of electrical power during the construction of its commercial production facilities and would also provide reliable back up power supply for the Leigh Creek Energy Project as it diversifies from power production to the supply of other products such as natural gas, ammonia and ammonium nitrate products (fertiliser and industrial explosives).[245]
South Australian Chamber of Mines and Energy	SACOME submitted that ElectraNet's North-West and North-East line reinforcement contingent projects are essential infrastructure for the Gawler Craton mineral province and Flinders Ranges coal fields. SACOME submitted that the Leigh Creek coal fields are undergoing exploration and eventual trials for the potential to gasify the existing coal deposits for energy generation. SACOME considered that the prospectivity of the Gawler Craton and utilisation of the existing coal fields at Leigh Creek for energy production will necessitate the need for additional transmission capacity.[246] SACOME submitted that a connection of 35MW or greater would require an upgrade of the Davenport to Leigh Creek line. The Leigh Creek coal gasification project is proposed to include a 150MW gas power plant which would trigger the requirement for a line reinforcement.[247] SACOME submitted that Leigh Creek Energy is proposing to commence its coal gasification project in 2018 with a start-up date of 2020. SACOME consider that the size of the additional generation in this region and the development schedule proposed by Leigh Creek energy will likely trigger this contingent project during the regulatory period.[248]

Source: AER analysis.

D.3.3 Upper North-West Line Reinforcement

ElectraNet submitted that it has received a number of recent medium to large connection enquiries in the vicinity of the Davenport to Pimba 132kV line due to interest in mineral exploration and resource development in the area.[249] ElectraNet submitted that to support any material additional loads, rebuilding of the line would be required from Davenport to the point where the new load connected.[250]

The existing Davenport to Pimba 132kV transmission line has a load rating of 76 MVA and a thermal rating of 49 C, which has been shown to be inadequate for Australian summer conditions. The line was uprated by lifting the lowest spans using insulated cross-arms to allow a load rating of 76MVA during the 1980s to support the initial development of Olympic Dam. ElectraNet considered that this uprating represents the

244 AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.
245 Leigh Creek Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 7 July 2017.
246 SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.
247 SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.
248 SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.
249 ElectraNet, *Response to AER Information Request #001*, *ElectraNet-IR001-Response Summary Document-20170419-Public*, 21 April 2017, p. 13.
250 ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 13.

mechanical limit for the structures involved.[251] Any step load increase causing the line to exceed its thermal limit of 76 MVA would require a rebuild of the circuit.[252]

This contingent project is estimated to cost $110 million. This estimate is based on the rebuilding of the Davenport to Leigh Creek 132kV line to Mount Gunson and the establishment of a 132/33 kV substation and associated works.[253]

ElectraNet proposed the following trigger events for this contingent project:[254]

- customer commitment for additional load to connect to the transmission network causing the Davenport to Pimba 132kV line to exceed its thermal limit of 76 MVA
- successful completion of the RIT-T including an assessment of credible options showing a transmission investment is justified
- determination by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

AER considerations

We consider that the Upper North-West Line Reinforcement ($110 million) may be reasonably required to be undertaken in order to achieve the capital expenditure objectives. However, we consider that the trigger events should be amended in order for us to be satisfied that each trigger event is appropriate.

We accept the Upper North-West Line Reinforcement project as a contingent project because the project may reasonably be required to be undertaken in order to efficiently meet expected demand for prescribed transmission services, based on the following:

- the likelihood based on connection enquiries that there will be an increase in resource development and mining activity in the upper north-west region of South Australia during the 2018-23 regulatory control period, and
- the likelihood that if there was an increase in resource development and mining activity in the upper north-west region of South Australia resulting in a step load increase in demand, the Davenport to Pimba 132kV line would exceed its thermal limit of 76 MVA and require either a significant uprating or rebuild.

As an example of the resource development activity in this region, we note that the Board of OZ Minerals has recently approved the development of the Carrapateena copper mine located in the region covered by the Upper North-West Line Reinforcement project. Work on a 550 person camp and airstrip began in September

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[251] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 14.
[252] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 14.
[253] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 14.
[254] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 13.

2017 with a second phase, which includes the construction of a power line, scheduled to commence in the second quarter of 2018. The mine is expected to start producing copper in late 2019.[255]

We consider that the RIT-T process will provide for an assessment of all credible options and determine a preferred economic approach for this project, which we will then review to verify that any proposed investment satisfies the RIT-T.

As set out in section D.2.2, we consider that Electra Net's proposed trigger of a determination by us under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T should be amended by removing the reference to clause 5.16.6 of the NER. Therefore, for us to be fully satisfied that this project should be a contingent project, ElectraNet should amend its trigger events to include:

- a determination by the AER that the proposed investment satisfies the RIT-T.

Submissions

We received a number of submissions in support of ElectraNet's proposed Upper North-West Line Reinforcement contingent project, as summarised below.

Table 6.14 Submissions on ElectraNet's Upper North-West Line Reinforcement contingent project

Stakeholder	Issue
Australian Energy Market Operator	In its review of ElectraNet's proposed capex projects, AEMO assessed ElectraNet's Upper North-West Line Reinforcement contingent project and associated trigger events.[256] AEMO stated that the existing Davenport-Pimba line needs to be augmented if there is a step load growth which results in the total load exceeding 55 MW.[257]
South Australian Chamber of Mines and Energy	SACOME submitted that ElectraNet's North-West and North-East line reinforcement contingent projects are essential infrastructure for the Gawler Craton mineral province and Flinders Ranges coal fields. SACOME submitted that the Eastern flank of the Gawler Craton that the Davenport to Mt Gunson and Pimba lines service is highly prospective for Iron Ore-Copper-Gold deposits. SACOME stated that the Carrapateena copper project will require a connection into the 132kV line at Mt Gunson and that Carrapateena is one of several deposits identified.[258] SACOME submitted that they are aware that new renewable energy projects have been proposed at Roxby Downs (Lyon Group) and Port Augusta (Solar Reserve) which will further increase the load on the line in the future. These projects are at a mature stage of development with proponents seeking partnerships and offtake agreements.[259] SACOME submitted that ElectraNet's proposed contingent transmission line projects (Eyre Peninsula, North-West and North-East) are all in regions where there is expected to be significant mineral and energy developments becoming operational in the next five years. SACOME considered that ElectraNet's transmission assets in these regions are

[255] The Advertiser, *OZ Minerals board approves development of SA's second biggest mine, Carrapateena, posts $81m H1 profit*, 25 August 2017.

[256] AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

[257] AEMO, *Independent Planning Review - ElectraNet Capital Expenditure Projects*, March 2017, p. 44.

[258] SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.

[259] SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.

Stakeholder	Issue
	old and require reinforcement or upgrading to meet future load demand, and that the nature of mineral and energy developments combined with the process to upgrade transmission assets causes a circular impasse. Contingent projects predicated by development triggers are necessary to alleviate this.[260]

Source: AER analysis.

D.3.4 Main Grid System Strength Support

ElectraNet submitted that AEMO has identified that the operation of large high voltage power systems such as South Australia at low fault levels can result in the conditions of the power system being unstable due to factors such as:[261]

- manufacturers' design limits on power electronic interfaced devices such as wind turbines and static Var compensators
- protection systems which rely on measurement of current or current and voltage during a fault to achieve two basic requirements – selectivity (that is, to operate only for conditions for which the system has been installed) and sensitivity (that is, to be sufficiently sensitive to faults on the equipment it is protecting), and
- inability to control voltage during normal system and market operations such as switching of transmission lines or transformers, switching reactive plant (capacitors and reactors), transformer tap changes and routine variations in load or generation.

ElectraNet submitted that AEMO's preliminary analysis of 13 November 2016 concluded that two large synchronous generating units, or combinations of smaller generating units, are required to be online in South Australia to ensure a secure operating state as defined in clause 4.2.2 of the NER. AEMO concluded that this may demonstrate the existence of a Network Support and Control Ancillary Services (NSCAS) gap. ElectraNet submitted that AEMO planned to further investigate this issue and will collaborate with ElectraNet to confirm the existence, size, and trigger date of the NSCAS gap.[262]

ElectraNet submitted that the requirement for the project is to maintain minimum fault levels in South Australia for foreseeable operating conditions above a level that is sufficient to ensure that:[263]

- power electronic interfaced devices such as wind turbines and static Var compensators can remain stable
- protection systems can adequately function, and

[260] SA Chamber of Mines and Energy, *Submission on ElectraNet 2018-23 Revenue Proposal*, 11 July 2017.
[261] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 17.
[262] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 17.
[263] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 17.

- voltage can be maintained during normal system and market operations including switching transformers, transmission lines and reactive plant, transformer tap changing, and routine variations in load or generation.

ElectraNet proposed $60 to $80 million for this project based on installing six synchronous condensers on its 275 kV transmission network (two each at Tailem Bend, Robertstown and Davenport) as well as associated substation works.[264] [265]

ElectraNet proposed the following trigger events for this contingent project:[266]

- confirmation by AEMO of the existence of a NSCAS gap relating to system strength, or other requirement for ElectraNet to address a system strength requirement, in the South Australian region
- successful completion of the RIT-T (or equivalent economic evaluation) including an assessment of credible options showing a transmission investment is justified
- successful determination (if applicable) by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

AER considerations

We consider that the Main Grid System Strength Support project ($60 to $80 million) may be reasonably required to be undertaken in order to achieve the capex objectives. However, we consider that the trigger events should be amended in order for us to be satisfied that each trigger event is appropriate.

We accept the Main Grid System Strength Support project as a contingent project because the project may reasonably be required to be undertaken in order to maintain the reliability and security of the transmission network, based on the issues identified by AEMO in respect to the stability of power systems.[267] AEMO reported that increasing levels of asynchronous intermittent renewable generation impact on the stability of power systems that operate at low fault levels.[268] We acknowledge ElectraNet's concern that with increasing levels of asynchronous renewable generation, decreasing system demand and the progressive withdrawal or mothballing of conventional synchronous generation, there is an increasing risk that without intervention insufficient synchronous generators will participate in the market at times when renewable generation exceeds demand.[269]

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[264] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 18.

[265] ElectraNet, *Response to AER Information Request #004*, *ElectraNet_IR004_Contingent Projects_20170626 - Public*, 26 June 2017, p. 10.

[266] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 16.

[267] NER, cl. 6A.8.1(b)(1).

[268] AEMO, *South Australia System Strength Assessment*, September 2017.

[269] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 16.

AEMO identified an incident on 13 November 2016 where the South Australian power system was operated with only one synchronous generating unit in service. Subsequent analysis has shown that the power system was not in a secure operating state during this period. Subsequently, AEMO implemented new procedures to ensure the minimum number of synchronous generating units are on line.[270] Such an approach by AEMO is consistent with ElectraNet's proposed scope for this contingent project of installing six synchronous condensers at selected locations across its transmission network.[271]

One of the proposed trigger events requires confirmation by a third party (AEMO) of the existence of a NSCAS gap, or other condition, relating to a system strength requirement. ElectraNet acknowledged that confirmation of the existence, size, and trigger date of a potential NSCAS gap, or other requirement for ElectraNet to address a system strength requirement in the South Australian region, will determine the need and timing for this project.[272]

On 13 September 2017, AEMO published an update to its 2016 National Transmission Network Development Plan (NTNDP) declaring a Network Support and Control Ancillary Services (NSCAS) gap for system strength in South Australia.[273] Following the AEMC's declaration on 19 September 2017 of changes to the NER for managing system strength[274], AEMO considered that South Australia's system strength needs will be better managed under the AEMC's new framework.[275]

AEMO stated that the NSCAS gap:[276]

- requires the provision of system strength services, including fault current, for areas of South Australia with high non-synchronous penetration levels
- is required for maintaining power system security
- exists today, and is required for the remainder of the current five-year NSCAS planning horizon (until 1 July 2021) and beyond.

AEMO stated that it will continue to review the technical capability of different solutions (including synchronous condensers and combinations of generating units) to providing power system security.[277] AEMO also stated that ElectraNet may choose to meet the NSCAS gap as a fault level shortfall under the new system strength framework and

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[270] AEMO, *Power system not in a secure operating state in South Australia on 13 November 2016*, 6 April 2016.

[271] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 16.

[272] ElectraNet, *Revenue Proposal 2019–23 - Attachment 6 - Appendix B: Contingent Projects*, 28 March 2017, p. 17.

[273] AEMO, *South Australia System Strength Assessment*, September 2017.

[274] AEMC, *Rule Determination - National Electricity Amendment (Managing power system fault levels) Rule 2017*, 19 September 2017.

[275] AEMO, *Second update to the 2016 National Transmission Network Development Plan for the National Electricity Market*, October 2017, p. 3.

[276] AEMO, *Second update to the 2016 National Transmission Network Development Plan for the National Electricity Market*, October 2017, p. 5.

[277] AEMO, *Second update to the 2016 National Transmission Network Development Plan for the National Electricity Market*, October 2017, p. 6.

that AEMO will be required to approve the technical specifications, and performance standards of any system strength service.[278] AEMO stated that it will endeavour to provide transparency to this process by consulting with us and by publishing its assessments.[279] We expect that ElectraNet's revised proposal may address these circumstances, including any implications for ElectraNet's ex-ante capex or opex forecasts for the 2018–23 regulatory control period or this contingent project.

We consider that the RIT-T process associated with this project will provide for an assessment of credible options and determine a preferred approach for this project, which we will then review to verify that any proposed investment satisfies the RIT-T.

As set out in section D.2.2, we consider that ElectraNet's proposed trigger of a determination by us under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T should be amended by removing the reference to clause 5.16.6 of the NER. Therefore, for us to be fully satisfied that this project should be a contingent project, ElectraNet should amend its trigger events to include:

- a determination by the AER that the proposed investment satisfies the RIT-T.

Submissions

We received a number of submissions addressing ElectraNet's proposed Main Grid System Strength Support contingent project. A summary of these submissions is presented below.

Table 6.15 Submissions on ElectraNet's Main Grid System Strength Support contingent project

Stakeholder	Issue
Consumer Challenge Panel	The CCP submitted that the Main Grid System Strength Support contingent project overlaps with the rule change resulting from the AEMC System Security Market Frameworks Review.[280]
South Australian Department of the Premier and Cabinet	The SADPC concurred with AEMO's assessment that non-synchronous generation is unable to provide system restart ancillary services. The SAPDC submitted that this primarily stems from the source intermittency and the need for a minimum system strength or fault level which is not available during black system conditions. The SADPC noted that the AEMC's Emergency Frequency Control Scheme rule change request will ensure a regular review of current and emerging power system frequency risks to allow AEMO to identify and implement the most efficient means of managing emergency frequency events. The SADPC also noted that the AEMC recently released a draft rule and draft determination on managing power system fault levels rule change request which provides for an enhanced framework that requires network service providers to maintain the system strength at generating system connection points above

[278] AEMO, *Second update to the 2016 National Transmission Network Development Plan for the National Electricity Market*, October 2017, p. 6.

[279] AEMO, *Second update to the 2016 National Transmission Network Development Plan for the National Electricity Market*, October 2017, p. 6.

[280] Consumer Challenge Panel Sub-Panel 9, *Submission to ElectraNet - Eyre Peninsula Electricity Supply Options RIT-T Project Specification Consultation Report*, 21 July 2017, p. 32.

Stakeholder	Issue
	agreed minimum levels under a defined range of conditions. The SADPC submitted that any decisions involving contingent capex for the Main Grid System Strength Support project will need to be balanced against the ongoing consideration of the regulatory frameworks being developed that affect system security in the NEM.[281]

Source: AER analysis.

[281] Government of South Australia, Department of Premier and Cabinet, *Submission on ElectraNet 2018-23 Revenue Proposal*, 12 July 2017.

E Ex post review – 2014–15 and 2015–16 capex

We are required to provide a statement on whether roll forward of the regulatory asset base from the previous period contributes to the achievement of the capital expenditure incentive objective.[282] 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.[283]

The NER requires that the last two years of the previous regulatory control period (for the purposes of this decision, the 2013–18 regulatory control period) are excluded from the ex-post assessment of past capex.[284] Further, the NER prescribes that the review period does not include the regulatory year in which the first Capital Expenditure Incentive Guideline was published (2013–14) or any regulatory year that precedes that regulatory year.[285] Accordingly, our ex-post assessment only applies to the 2014–15 and 2015-16 regulatory years.

We may exclude capex from being rolled into the RAB in three circumstances:[286]

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

E.1 Position

We are satisfied that ElectraNet's capital expenditure in the 2014–15 and 2015-16 regulatory years should be rolled into the RAB.

E.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:[287]

- Stage one - initial consideration of actual capex performance

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282 NER, cl. 6A.14.2(b).
283 NER, cl. 6A.5A(a).
284 NER, cl. S6A.2.2A(a) & (a1).
285 NER, cl. 11.59.4(a).
286 NER, cl. S6A.2.2A.
287 AER, *Capital Expenditure Incentive Guideline*, November 2013, pp. 19-22.

- Stage two - detailed assessment of drivers of capex and management and planning tools and practices.

The first stage considers whether the TNSP 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 TNSP had overspent against its allowance, the overspend was significant, and its capex performance in the period of our ex-post assessment suggests that levels of capex may not be efficient or do not compare favourably to other TNSPs.

E.3 AER assessment

We have reviewed ElectraNet's capex performance for the 2014–15 and 2015-16 regulatory years. This assessment has considered ElectraNet's out-turn capex relative to the regulatory allowance given the incentive properties of the regulatory regime for a TNSP to minimise costs.

ElectraNet incurred capex below its forecast regulatory allowance for the 2014–15 and 2015-16 regulatory years. Therefore, the overspending requirement for an efficiency review of past capex is not satisfied.[288] We also consider that the 'margin' and capitalisation requirements for a review are not satisfied., Given the incentive based regulatory framework provides an incentive for a TNSP to minimise costs, and that ElectraNet has underspent, we are satisfied that ElectraNet's 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.[289] 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.

We have committed to a review of our application of economic benchmarking for transmission network businesses. We commenced our public consultation in May 2017[290], conducted a round table discussion, sought submissions, and released a position paper containing recommended changes to the transmission benchmarking models. We aim to publish the results of our transmission benchmarking review in late 2017.

Until this process is complete 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

[288] NER, cl. S6A.2.2A(c).

[289] AER, *Annual benchmarking report: Electricity transmission network service providers*, November 2016.

[290] https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/annual-benchmarking-report-2017-0/initiation

from our benchmarking report suggest that ElectraNet's overall efficiency improved in 2015, and its performance is better than several other TNSPs.

Under the NER, we are able to exclude capex only where a TNSP has overspent its allowance. ElectraNet underspent its allowance for the 2014–15 and 2015-16 regulatory years. However, this does not necessarily mean that the expenditure was prudent and efficient. ElectraNet identified a number of initiatives to improve the efficiency of its capital expenditure program over the current and previous regulatory periods, including:[291]

- deferred augmentation and connection works in response to lower demand forecasts
- advocating a reduction in the required connection point standard to successfully remove the need for an uneconomic upgrade to the Baroota substation
- savings through targeted scope improvements and more efficient procurement and delivery of capital works
- implementing a comprehensive competitive tendering process to pre-qualify and engage construction contractors
- implementing a new organisational structure to better align internal functions with core responsibilities, to improve capital project delivery performance
- enhanced internal capability to produce more robust capital project cost estimates.

ElectraNet submitted that it expects to deliver the capital program in the 2013–18 regulatory control period for approximately six per cent ($48 million) less than its capex allowance.[292]

[291] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 40.

[292] ElectraNet, *Revenue proposal 2019-23 – Attachment 6 Capital Expenditure*, 28 March 2017, p. 21.