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Eyre Peninsula Upgrade

Project Assessment Conclusions Report

December 2025

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Revision Record

Date	Version	Description	Author	Checked by	Approved by
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Executive Summary

Large industrial load growth on the Eyre Peninsula

Over the coming years, South Australia's Eyre Peninsula is expected to experience high levels of economic activity and associated growth in electricity demand, with energy intensive industries such as mining, data centres and green steel processing seeking connection to the transmission network. The Eyre Peninsula includes, and is close to, resources that help support this expected growth, including high quality renewable energy sites.

The growth on the Eyre Peninsula was anticipated when ElectraNet conducted the Regulatory Investment Test for Transmission (RIT-T) analysis of the 'Eyre Peninsula Link' project over 2017-18[1], which provided for the option of future low-cost expansion of the transmission network on the peninsula. The likelihood of substantial load growth was also recognised in the AER's April 2023 Determination of ElectraNet's revenue for the 2023-2028 period through the inclusion of the 'Eyre Peninsula Upgrade' contingent project.

Both of these processes recognised the likelihood that electricity transmission capacity on the Eyre Peninsula would need to be upgraded to supply potential load growth, but that the timing was uncertain.

ElectraNet has been engaging for some time with proponents of several potential significant load developments on the Eyre Peninsula. This has led us to conclude that expansion of the network capacity is now required and that, without action, parts of the transmission network will serve as constraints on the growth of both new and existing loads on the Eyre Peninsula.

This RIT-T is being undertaken to ensure reliable supply

The identified need for this RIT-T is a 'reliability corrective action' as defined under NER 5.10.2. The objective is to meet the regulatory obligations and service standards contained in schedule 5.1 of the NER and the connection point reliability standards of the Essential Services Commission of South Australia's (ESCOSA) Electricity Transmission code (ETC). This is required to meet growing customer electricity demand and maintain reliability standards on the Eyre Peninsula transmission network supplied from Davenport.

Without action, key network limitations on the Eyre Peninsula are expected to be the:

- Cultana 275/132 kV transformers (which have a secure thermal limit of 200 MVA); or
- Cultana to Yadnarie double-circuit transmission line, operated at 132 kV (which has a secure thermal limit of 241 MVA[2]); or
- Davenport to Cultana 275 kV double-circuit transmission line (which has a secure thermal limit of 597 MVA).

[1] Eyre Peninsula Electricity Supply Options - PACR

[2] Due to the length of this transmission line its voltage constraint precedes the thermal one. Hence, the maximum secure (N-1) load that can be connected at Yadnarie is 120 MVA.

ElectraNet must implement a solution before 2030, assuming the demand outlook in the AEMO 2024 ISP Step Change scenario, to ensure compliance with the ETC. Doing so will prevent the risk of significant involuntary load shedding for customers on the peninsula.

This Project Assessment Conclusions Report (PACR) represents the final stage of the RIT-T process. It follows publication of the Project Specification Consultation Report (PSCR) in December 2023, and the Project Assessment Draft Report (PADR) in March 2025.

No submissions were received on the PADR

ElectraNet did not receive any submissions in response to the PADR.

We have developed three different load forecasts, consistent with recently updated AEMO criteria

A key determinant of the scope and timing of the optimal supply solution for the Eyre Peninsula is the forecast level and location of new spot load.

We have applied three different scenarios load forecast to assess the various upgrade options. Each scenario has been derived from the AEMO 2024 ISP Step Change forecast with adjustments made for differing views of future major load developments, consistent with the latest AEMO Electricity Demand Forecasting Methodology (which uses a more granular classification of prospective load than in the 2024 ISP).[3] AEMO's updated methodology was published in July 2025 and for the purpose of this PACR, we have adopted the classifications defined by AEMO for prospective large industrial loads (LILs), in addition to committed LILs.

The methodology classifies a prospective LIL as anticipated or proposed, depending on its progress in the connection process and the likelihood of completion. A more detailed description can be found in Appendix D.

The three demand scenarios are essentially the same as those applied in the PADR, with some minor updates on their timings (arising from more recent information) and can be summarised as:

- **Low demand scenario** – consists of all existing and 'committed' loads.
- **Central demand scenario** – all the loads in the low scenario plus the 'anticipated' large industrial loads.
- **High demand scenario** – all the loads in the central scenario plus the 'proposed' large industrial loads, that align with government policies.

Updating the AEMO 2024 ISP Step Change demand forecasts in line with AEMO's Electricity Demand Forecasting Methodology is appropriate for this RIT-T in light of the additional information and communication ElectraNet has had with proponents of these loads through the connections process. Using the unadjusted ISP 2024 Step Change forecast would under-represent the expected load on the peninsula, as informed through our connections process, and risk an inefficient supply solution.

[3] AEMO, 2025 Forecasting approach - Electricity Demand Forecasting Methodology

The analysis in this PACR has not been updated to reflect the demand forecasts in the latest AEMO Electricity Statement of Opportunities (ESOO) released in August 2025. Doing so would delay the publication of this PACR and is not considered a proportionate exercise as would not be expected to change the preferred option.

The other two scenarios from the 2024 ISP (that is, the Progressive Change and Green Energy Exports scenarios involving different market development trajectories), and the 2026 ISP scenarios, are not considered relevant for this RIT-T since wholesale market benefits are not expected to be materially different across the options (as outlined below).

Four options have been assessed, including two staged variants

We have identified four credible options to meet the identified need, depending on the location of load growth on the Eyre Peninsula. Specifically:

- Options 1, 2 and 3 are alternatives to each other and would address the possible overloading of the transformers at Cultana. These options would provide additional transfer capacity between Cultana and Yadnarie; while
- Option 4 can be implemented in combination with Options 1, 2 or 3 and would address the possible future overload of the link between Davenport and the Eyre Peninsula (Cultana/Cultana East). This option would accommodate further additional load on the peninsula.

The four options are summarised in the two tables below.

The substance of the options has not changed from the PADR. However, as a result of further planning and updates on potential connection timing and location for some of the anticipated LILs since the PADR, we have determined the need for three complementary works, which have now been included within the scope of the relevant options:

- The implementation of an automated voltage control scheme, to ensure the efficient management of the complex voltage profile in and around the Eyre Peninsula.
    - This is required for Options 1, 2 and 3 (and would be implemented at the same time as the first stage of Options 2 and 3).
    - The estimated capital cost of these works is $2 million (2024-25);
- Upgrading the expected Mullaquana connection point to 275 kV to facilitate load growth from existing and new connections in that area.
    - This is required for Options 1, 2 and 3 but only under the central and high scenarios (and occurs at the same time as the line upgrade) – the low demand scenario does not require this upgrade as under that scenario there is no new load expected in this area.
    - The estimated capital cost of these works is $80 million (2024-25), and this would be a prescribed asset[4].

[4] ElectraNet would apply to the AER for recovery of these costs via a contingent project application once there is sufficient certainty relating to the LILs connecting at Mullaquana.

- Reconfiguration of the 275 kV connections around Cultana East/Cultana.
  - Option 4 would connect to our new Cultana East site, in the proximity of Cultana and we plan to reconfigure some of the connections on these two sites to rationalise and improve their connectivity to our network.
  - The estimated capital cost of the reconfiguration is $105 million (2024-25).

Additionally, all the cost estimates have been reviewed since the PADR and updated based on new information from consultants, suppliers and contractors.

Table 1: Summary of the credible options assessed

Option	Capacity increases, MVA		Estimated capital cost, $million 2024-25[5]
	Cultana	Yadnarie[6]	
Alternatives to each other to provide additional capacity between Cultana and Yadnarie			
Option 1 – Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation[7]	79*	480	184
Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana	200	-	42
and a capacitor bank at Yadnarie North	-	90	75
Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	79*	480	156.5
Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers	100	-	37
and a capacitor bank at Yadnarie North	-	90	75
Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	79*	480	156.5
Complementary works required under Options 1, 2 and 3			
Implement an automated voltage control scheme for the Eyre Peninsula and surrounding areas	-	-	2
May be required (central and high scenarios only) - Upgrade expected Mullaquana connection point to 275 kV	-	-	80

[5] All costs and benefits quoted in this PACR are in 2024-25 dollars unless stated otherwise.
[6] The increase is based on the transmission line voltage constraint of 120 MVA.
[7] The completion of the Eyre Peninsula Link project in 2023, retained the availability to upgrade the transmission line with the construction of a double-circuit transmission line between Cultana and Yadnarie designed for 275 kV, but operated initially at 132 kV.

Option	Capacity increases, MVA		Estimated capital cost, $million 2024-25[5]
	Cultana	Yadnarie[6]	
Option to accommodate further additional load on the peninsula			
Option 4: Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport	1,200	-	537
Complementary works under Option 4 - reconfigure connections around Cultana and Cultana East	-	-	105

* This option does not increase the capacity at Cultana, but it releases existing capacity as it transfers loads to the 275 kV network, via the new 275/132 kV Yadnarie North substation. This value is based on the present load connected to Yadnarie.

Table 2: Timing of the credible options across the three load scenarios assumed

Option	Low	Central	High
*Alternatives to each other to provide additional capacity between Cultana and Yadnarie**			
Option 1 – Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation	2029/30	2027/28	2027/28
Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana	2029/30	2027/28	2027/28
Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	-	2028/29	2028/29
Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers	2029/30	2027/28	2027/28
Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	-	2028/29	2028/29
Option to accommodate further additional load on the peninsula			
Option 4: Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport	-	2037/38	2030/31

* Options 1, 2 and 3 include the associated complementary works, where required, on the same timing.

ElectraNet has not identified any non-network solution that could help address the identified need for this RIT-T. No submissions relating to non-network proposals have been received over the course of this RIT-T.

Wholesale market modelling has not been undertaken

The only two categories of market benefit under the RIT-T that could be material are:

- changes in involuntary load shedding – due to each option being able to avoid different levels of unserved energy under the base case; and
- changes in network losses – due to the different capacity options resulting in different levels of electrical losses on the peninsula.

Both of these market benefit categories have been modelled using PLEXOS and included in the PACR assessment (and have not changed from the PADR assessment).

All options are also expected to deliver significant wholesale market benefits compared to the base case (e.g. through improving the efficiency of wider wholesale market build and operational decisions). However, these impacts are not expected to materially affect the ranking of the options and therefore the outcome of the RIT-T and so have not been estimated. Put another way, these categories of market benefits would only improve the net benefit of the preferred option and would not alter its standing relative to the other options.

Option 1 plus Option 4 is the preferred option

As shown in Table 3 the preferred option ranks ahead of the other options under the central and high demand scenarios given its significantly lower cost than the other options. As a result, the overall average shows a lower cost for the preferred option when compared to the other ones.

ElectraNet's analysis confirms the PADR draft conclusion that Option 1 in combination with Option 4 has the least cost (greatest net benefit) under the central and high demand scenarios, and on a weighted basis.[8]

While the estimated net benefits are negative overall, the investment is justified under the RIT-T since the identified need is a reliability corrective action (which permits the preferred option to have negative net market benefits).

Table 3. Net benefits relative to the base case ($m 2024-25)

Option	Low demand scenario[9]		Central demand scenario		High demand scenario		Weighted (average)	
	NPV	Rank	NPV	Rank	NPV	Rank	NPV	Rank
Option 1 + Option 4	**-127.44**	**3**	**-347.51**	**1**	**-716.29**	**1**	**-397.08**	**1**
Option 2 + Option 4	-82.17	2	-400.95	3	-764.05	3	-415.72	3
Option 3 + Option 4	-78.82	1	-396.89	2	-760.42	2	-412.04	2

[8] The weighted outcome assigns the same weighting (a third) to each of the three load scenarios which equals the average value of the three scenarios.

[9] Under the low forecast scenario none of the options 1-3 require option 4, as the total demand in the Eyre Peninsula can be served with the existing transmission line between Davenport - Cultana. Additionally, options 2 and 3 will only require stage 1.

The inclusion of the cost of two of the complementary works (ie, automatic voltage control and the Mullaquana connection point upgrade) as part of the cost benefit analysis, where applicable, has not affected the outcome of the RIT-T, as the costs are common across Options 1, 2 and 3. The cost of the third complementary work (ie, reconfigure connections around Cultana and Cultana East) also does not affect the ranking of the options and it is included only for Option 4.

Sensitivity analysis with respect to capital costs and other assumptions further supports Option 1 + Option 4 as the preferred option. While the preferred option ranks behind the other options under the low scenario, boundary value analysis undertaken shows that this scenario would need to be given an unreasonably high chance of occurring in the analysis in order to change the overall weighted result.

Moreover, the more granular classification of future LILs adopted in line with AEMO's Electricity Demand Forecasting Methodology further supports the basis of the central and high demand scenarios.

The preferred option identified in this PACR is the combination of two of the options assessed:

- **Option 1** - Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation; and
- **Option 4** - Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport, subject to commitment of a further around 400 MW of electrical load by 1 January 2031 on the Eyre Peninsula network, supplied out of Davenport.

These options consist of:

- Option 1
  - Constructing a new Yadnarie North substation;
  - Introducing 275/132 kV transformation at the Yadnarie North substation;
  - Reconnecting the 132 kV exits at the existing Cultana substation on the 275 kV side;
  - Implementing an automated voltage control scheme for the Eyre Peninsula and surrounding areas; and
  - Upgrading the expected connection point at Mullaquana for LILs along the Cultana-Yadnarie transmission line to 275 kV (as required).
- Option 4
  - Establishing a new substation approximately 30 km north of Davenport, close to Narcoona;
  - Expansion of Davenport and Cultana East substations at 275 kV;

- A double circuit 275 kV overhead transmission line of approximately 30 km and rated at around 600 MVA per circuit or higher[10], connecting Davenport to the new site at Narcoona[11]; and
- A new double circuit 275 kV overhead transmission line of approximately 70 km and rated at around 600 MVA per circuit or higher[10], connecting the new site at Narcoona to Cultana East.

Option 1 has an estimated capital cost of approximately $266 million (including the two complementary works), while Option 4 has an estimated capital cost of approximately $642 million (including the additional reconfiguration at Cultana/Cultana East) giving an overall cost for the preferred option of $908 million.

A lower load forecast not supporting the Option 4 components is the key re-opening trigger for this RIT-T

Consistent with the Material Change in Circumstance (MCC) provisions in the NER[12], we have considered the impact of changes in key underlying assumptions on the RIT-T outcome and identified re-opening triggers.

The key re-opening trigger for this RIT-T is the load required to justify establishing a new site close to Davenport and duplicating the 275 kV circuits supplying the Eyre Peninsula from Davenport (i.e. the Option 4 components) not eventuating. Specifically, based on the assessment included in this PACR, we consider that the following is a re-opening trigger under this RIT-T:

- No central (Step Change) demand forecast published by AEMO before 1 January 2031, with a total load forecast (existing plus committed) for the Eyre Peninsula above 570 MW[13].

Should outturn demand not be sufficient to justify the Option 4 components, ElectraNet would provide a letter to the AER outlining how, as a consequence, the preferred option for this RIT-T would change and that this component would no longer be required. Given that this component of the preferred option is separable, a decision not to proceed with Option 4 would have no implications for the Option 1 components, and ElectraNet does not consider that a new RIT-T would therefore be required.

Based on the sensitivity assessment included in this PACR, we do not consider there to be any other relevant re-opening triggers for this RIT-T. Specifically, the finding that Option 1 (plus Option 4) is the preferred option is found to be robust to all key assumptions (e.g. assumed capital costs, discounts rates, etc).

[10] Depending on the evolution of future demand in the Eyre Peninsula it could be necessary to increase the rating of these circuits.

[11] These two circuits could be made from a combination of existing and new sections of 275 kV transmission lines. We are progressing studies to determine the most secure and economic design.

[12] NER, cl. 5.16.4(k)(10), (z3) and (z4).

[13] This corresponds to the N-1 thermal capacity of the double circuit 275 kV Davenport-Cultana transmission line assuming a 0.95 power factor.

Next steps

This PACR is the final stage in the RIT-T process.

ElectraNet's conclusion is that the preferred option identified in this PACR is the combination of two of the options:

- **Option 1** - Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation (and implement an automated voltage control scheme and upgrade the Mullaquana connection point to 275 kV, when required); and
- **Option 4** - Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport, subject to commitment of a further around 400 MW of electrical load by 1 January 2031 on the Eyre Peninsula network, supplied out of Davenport. This will increase the total load in the Eyre Peninsula to around 570 MW.

Further details on the RIT-T can be obtained via consultation@electranet.com.au, or from our Eyre Peninsula Upgrade webpage. In the subject field of any email, please reference 'Eyre Peninsula Upgrade – RIT-T feedback'.

Contents

List of Figures

List of Tables

Appendices

1 Introduction

1.1 Background

In February 2023, following two years of construction and over five years of planning, ElectraNet energised a new high-voltage power line on the Eyre Peninsula and upgraded five electricity substations. This new line, referred to as 'Eyre Peninsula Link',[14] replaced the previous line, which had been in service for more than 50 years and which was near the end of its operational life.

The decision to build Eyre Peninsula Link and upgrade the associated substations followed assessment under a Regulatory Investment Test for Transmission (RIT-T) undertaken over 2017-2018. This earlier RIT-T noted that future load growth was likely on Eyre Peninsula, but that the timing was uncertain. Considering that uncertainty, ElectraNet concluded that the most efficient way to provide a reliable supply to the Eyre Peninsula at the time was to configure Eyre Peninsula Link as:[15]

- A new double-circuit line from Cultana to Yadnarie that is
  - initially energised at 132 kV, but which
  - has the option to be energised at 275 kV if required in the future; and
- A new 132 kV double-circuit line from Yadnarie to Port Lincoln.

By retaining the ability to upgrade the Cultana to Yadnarie section of Eyre Peninsula Link to 275 kV, ElectraNet ensured that it is 'future proof' – having the ability to be upgraded at relatively low cost to supply the loads that were anticipated but uncertain at the time.

Consistent with this approach and considering the continuing potential for substantial load growth on the Eyre Peninsula in the near term, the potential upgrade of the Cultana to Yadnarie section of the Eyre Peninsula Link to 275 kV, together with the potential for further augmentation of the network to Davenport, was recognised as a contingent project by the AER in its revenue determination for our 2023-2028 regulatory control period.

That contingent project will be triggered if:

1. There is commitment for additional load from one or more customers to connect to the transmission network with aggregate load sufficient to cause the:
   a. Cultana 275/132 kV transformers to exceed their thermal limit of 200 MVA; or
   b. Whyalla Central 132/33 kV transformers to exceed their thermal limit of 120 MVA; or
   c. Whyalla Central to Cultana 132 kV lines to exceed their thermal limit of 121 MVA; or
   d. Cultana to Stony Point 132 kV line to exceed its thermal limit of 144 MVA; or
   e. Davenport to Cultana 275 kV lines to exceed their thermal limit of 594 MVA

   causing a need for the upgrade of the 132 kV Eyre Peninsula Link between Cultana and Yadnarie to 275 kV and/or augmentation of power transfer capacity between Davenport and Cultana and/or Cultana and Whyalla and/or Cultana and Stony Point.

[14] AEMO, *Appendix 5. Network investments - Appendix to the 2022 ISP for the National Electricity Market*, June 2022, p 11.
[15] All RIT-T documentation for this previous RIT-T is available at: ElectraNet's RIT archive

2. The AER is satisfied that ElectraNet has successfully completed a RIT-T, including an assessment of credible options, showing the upgrade of the 132 kV Eyre Peninsula Link between Cultana and Yadnarie to 275 kV and/or augmentation of power transfer capacity between Davenport and Cultana and/or between Cultana and Whyalla and/or Cultana and Stony Point is the preferred option:
   a. Demonstrating positive net market benefits; and/or
   b. Addressing a reliability corrective action.
3. The ElectraNet Board commits to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

ElectraNet has been engaging closely with proponents of several likely load developments on the Eyre Peninsula. Based on the load locations and suggested timing, we expect that the Cultana 275 kV transformers, the transmission line operating at 132 kV between Cultana and Yadnarie and the Davenport to Cultana 275 kV circuits will be overloaded, much sooner than forecast based only on underlying load growth.

This Project Assessment Draft Report (PACR) follows on from our PSCR published in December 2023[16] and the PADR of March 2025.[17]

1.2 Role of this report

This PACR is the third step in the RIT-T process. The purpose of this PACR is to:

- Summarise the reasons why ElectraNet has determined that investment is necessary;
- Summarise the consultation processes to-date, noting that no submissions were received on the PADR;
- Describe the credible options that ElectraNet considers address the identified need – which remain substantially the same as in the PADR, but with the inclusion of three additional complementary works identified through further planning;
- Provide a description of the methodologies used in quantifying each class of material market benefit and cost, together with the reasons why ElectraNet has determined that some classes of market benefit are not material for this RIT-T;
- Present the NPV economic assessment of each of the credible options, including the assumptions underpinning this analysis;
- Identify and provide a detailed description of the credible option that satisfies the RIT-T, and is therefore the preferred option; and
- set out the proposed re-opening triggers, building on the sensitivity assessments undertaken, to provide transparency to stakeholders on what may constitute a later material change in circumstance for this RIT-T.

The cost benefit assessment in this PACR has been updated since the PADR, to reflect updated cost estimates for the options arising from updated capital costs, the addition of complementary works and an increase in the assumed operating costs for each option, as well

[16] ElectraNet - PSCR Eyre Peninsula RIT-T
[17] ElectraNet - PADR Eyre Peninsula RIT-T

as some slight adjustments to the load forecasts (based on updated tentative commencement dates for some of the LILs).

The entire RIT-T process is detailed in Appendix C. The next steps for this RIT-T assessment are discussed further below.

1.3 Next steps

This PACR represents the final stage in the RIT-T process. ElectraNet now intends to commence work on implementing the preferred option and to submit a Contingent Project Application to the Australian Energy Regulator (AER).

Parties wanting to contest any of the conclusions in this PACR should give notice in writing to the AER[18]. Any dispute notice should be made to prior to 19th January 2026 (30 days after publication of this PACR).[19]

Further details on the RIT-T can be obtained from ElectraNet's Planning team via consultation@electranet.com.au, or from our Eyre Peninsula Upgrade webpage. In the subject field of any email, please reference 'Eyre Peninsula Upgrade – RIT-T feedback'.

[18] NER, 5.16B (a), (b)
[19] NER, 5.16B (c)

2 The identified need

This section provides a description of the identified need for this RIT-T as well as outlining the assumptions used in assessing the identified need and why ElectraNet considers that reliability corrective action is necessary. This description remains substantially the same as in the PADR, with some minor updates to reflect more recent information.

2.1 New load developments on the Eyre Peninsula

2.1.1 Near and medium-term large industrial load developments

ElectraNet has received significant interest in large new load connections to the transmission network on the Eyre Peninsula. Without action, connection of these loads would be limited by the existing network capability.

ElectraNet has documented this interest starting with our May 2023 update[20] to our 2022 Transmission Annual Planning Report (TAPR) and our subsequent October 2023, October 2024 and June 2025 TAPRs.[21] These reports identified the potential for several hundred of MWs of new load at or south of Whyalla on the Eyre Peninsula.

Table 4 provides a summary of potential near and medium-term load developments that are planned to connect to the 132 kV network and have now submitted formal 'connection enquiries'[22] as part of the connection process. These loads are a mixture of commercial and industrial developments. The size of the load forecasts has not changed since the PADR, but there have been some minor changes to their tentative commencement times, based on more recent information. Because of the high likelihood of connection of these loads, and based on AEMO's categories for large industrial loads (LILs) in its updated Electricity Demand Forecast Methodology, ElectraNet considers that all the loads in Table 4 can be classified as "anticipated"[23].

[20] 2023 ElectraNet TAPR Update

[21] ElectraNet Transmission Annual Planning Reports

[22] NER, cl.5.3.2

[23] AEMO has proposed in its most recent Electricity Demand Forecasting Methodology that anticipated projects could be considered in the Step Change scenario only if they are proposed for beyond the "reliability obligation threshold". ElectraNet is of the opinion that this period underestimates the speed at which industry could act and establish a large industrial load.

Table 4 - Summary of potential near- and medium-term load developments connecting to 132 kV

Customer	Load Type	Tentative commencement year	Project Status[24]
Customer 8	Mine	2028	Anticipated
Customer 5 Stage 1*	Data centre	2028	Anticipated
Customer 5 Stage 2*	Data centre	2029	Anticipated
SA Government Northern Water[25] Stage 1*	Desalination	2031	Anticipated
SA Government Northern Water Stage 2*	Desalination	2033	Anticipated

To maintain confidentiality, we have not revealed the customers and have used the same naming convention applied initially on our May 2023 TAPR Update and thereafter. Note that some rows represent projects across multiple sites.
** Load contributes towards the loading of the Cultana transformers and the line between Cultana and Yadnarie.*

All the above projected loads would contribute towards the loading of the 275/132 kV transformers at Cultana (since they would be connecting to the 132 kV network). Of these loads, the last four loads in the table would be connecting south of Cultana and contributing to the loading of the Cultana-Yadnarie transmission line.

These loads represent 180 MW of connections during 2028, an additional 100 MW during 2029 and a final 90 MW during the early 2030s. These loads will increase the loading of the existing double-circuit transmission line between Cultana and Yadnarie, requiring its upgrade to 275 kV.

Table 5 shows additional proposed loads connecting at 275 kV at Cultana. These loads would increase the load between Cultana and Davenport.

Table 5 - Summary of potential near- and medium-term load developments connecting to 275 kV

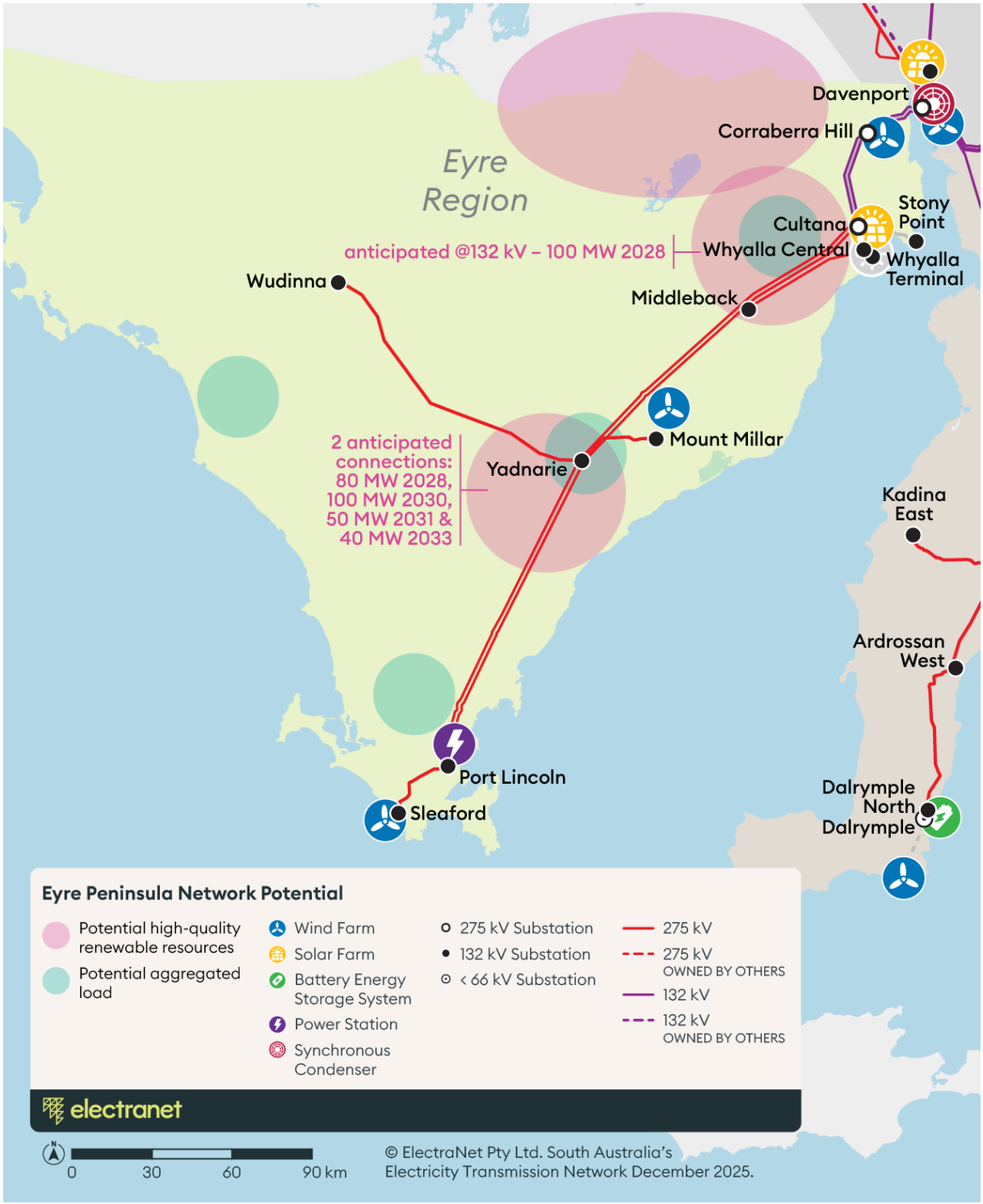
Customer	Load Type	Tentative commencement year	Status[26]
SA Government Port Bonython Hydrogen Hub[27]	Green hydrogen and other industries	2030 & 2035	Proposed
Steelworks	Electric furnace	2030	Proposed

[24] The status is based on the categories defined in AEMO Forecasting Approach - Draft Electricity Demand Forecasting Methodology. Nov. 2024
[25] Includes assumed capacity for the desalination plant and one pumping stations south of Yadnarie SA Government - North Water.
[26] The status is based on the categories defined in AEMO Forecasting Approach - Draft Electricity Demand Forecasting Methodology. Nov. 2024
[27] Port Bonython Hydrogen Hub | Energy & Mining

In addition, ElectraNet is aware of additional potential spot loads which may seek connection on the Eyre Peninsula, which are less defined but could contribute to the total load at Cultana. This is discussed in the next section.

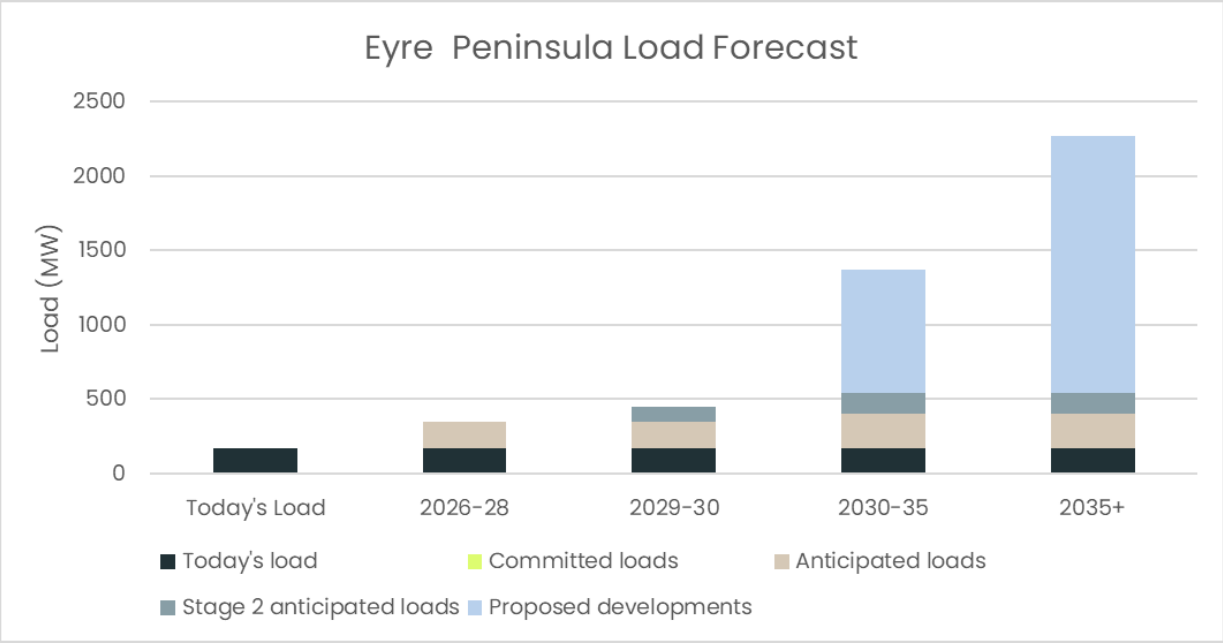
Figure 1 summarises the locations and magnitude of the potential spot loads from the previous two tables on the Eyre Peninsula.

Figure 1 – Potential large industrial spot load developments



In addition, Figure 2 shows a breakdown of these loads over time, according to their categories shown in Table 4 and Table 5.

Figure 2 - Eyre Peninsula load forecast



2.1.2 Longer-term large industrial load developments

Over the longer-term, there is also the potential for much more load to connect on the Eyre Peninsula associated with the development of load centres at Port Bonython and Cape Hardy. This would increase the required network capacity in the Northern Eyre Peninsula.

Specifically, in addition to the potential spot loads set out in Table 4 and Table 5 above, ElectraNet is also aware of other potential spot loads on the peninsula that are currently at a less certain level of development, but which would also contribute to the need for investment if they were to proceed.

An example of this is the agreement signed by Amp Energy[28] in April 2023 to develop green hydrogen at scale on the Cape Hardy Port Precinct in conjunction with Iron Road.[29] While the project is in the early stages of development, it is expected to involve up to 5 GW of load and has received support from Governments, including direct support in the form of a $25 million commitment from the Federal Government for the development of the deep-sea port and indirect support via the South Australian Government's Hydrogen and Renewable Energy Act 2023.[30] Pre-front End Engineering Design has been completed for the first stage, the Front End

[28] In May 2025, AMP Energy was acquired by Revera Energy. Revera is progressing the FEED.
[29] Cape Hardy Advanced Fuels Project
[30] Hydrogen and Renewable Energy Act

Engineering Design (FEED) is expected to start by the last quarter of 2025 and it is currently progressing with Environmental and Renewable Energy Permit Processes, -with a tentative first production date by the end of 2030.

In addition, there are plans to establish new mining operations or electrify existing ones on the Eyre Peninsula.

The addition of further load of such magnitudes is expected to require further augmentation of the transmission network on the Eyre Peninsula, over and above the upgrades assessed in this RIT-T, and independent of the preferred option for this RIT-T.

2.2 Potential renewable generation and BESS

The Eyre Peninsula, like a lot of South Australia, has significant, high-quality, wind and solar resources.

ElectraNet has received significant interest in new generator connections to the transmission network on the Eyre Peninsula. These potential renewable generation developments on the Eyre Peninsula may interact with any upgrade of the current network capacity.

Table 6 shows the generation and storage projects in the Eyre Peninsula that are committed or can be declared anticipated.

Table 6 - Committed and anticipated generation and storage projects in the Eyre Peninsula

Site name (Connection point)	Technology type	Nameplate capacity (MW) storage (MWh)	Tentative commencement	Status
Clements Gap – BESS (Clement Gap)	Storage - Battery	60 MW 120 MWh	May 2026	Committed
Lincoln Gap Wind Farm – BESS (Lincoln Gap)	Storage - Battery	10 MW 10 MWh	December 2025	Anticipated

In addition to these two projects, ElectraNet has responded to two other proposed wind farms and three solar farms seeking connection on the Eyre Peninsula with a total potential capacity of more than 2 GW. Similarly, there are several BESS proposals with a cumulative total capacity above 500 MW.

Further, as part of the South Australian Hydrogen and Renewable Energy Act 2023 (HRE Act) objectives, the South Australian Government completed the first stage of consultation for the first release areas at the end of 2024.[31] The HRE Act establishes Australia's first dedicated licensing and regulatory framework for large-scale hydrogen and renewable energy projects. After the consultation, the next step is to consider the feedback and determine if the lands within the proposed release area are suitable for declaration as a release area. Following this declaration renewable energy companies will be able to submit a competitive tender to develop large scale renewable energy projects on the land.

[31] Hydrogen and Renewable Energy Regulation - Release areas - Government of South Australia

The proposed first two release areas are the Gawler Ranges East and Whyalla West. These two areas are near the existing transmission lines between Davenport, Cultana and Middleback and already proponents are enquiring about possible connections for large renewable projects.

If there is no upgrade to the network on the Eyre Peninsula and these generators connect, ElectraNet expects that their output may be constrained at times. However, we consider that all options assessed in this PACR would affect the ability of potential renewable energy generators to connect and dispatch equally, and so this interaction is not considered material for this RIT-T (i.e. since it is not expected to differ across the options).

2.3 Statement of the 'identified need'

This RIT-T identified need is a 'reliability corrective action' as defined NER 5.10.2, as the objective is to meet the regulatory obligations and service standards contained in schedule 5.1 of the NER and the connection point reliability standards of the Essential Services Commission of South Australia's (ESCOSA) Electricity Transmission code (ETC). This is required to meet customer electricity demand growth and maintain reliability standards on the Eyre Peninsula transmission network connected to Davenport.

The ETC transmission reliability standards are generally expressed in terms of the amount of 'redundancy' that must be built into the network to avoid supply outages. Redundancy is generally expressed in 'N-x' terms, where 'x' reflects the number of critical elements[32] that could fail (or be out of service for maintenance) on the network without electricity supply being lost. For example:

- 'N-1' means that electricity supply will not be disrupted if one critical element of the network is out of service
- 'N-2' means that supply will not be disrupted if two separate elements are out of service

Generally, the higher the 'x', the more reliable the network, as it means that electricity will continue to be supplied, even with more elements of the network out of service.

The ETC specifies that ElectraNet must use best endeavours in planning, developing and operating the *transmission network*[33] to fulfill the quality standards as mandated by the NER and the ETC. The main objective is to ensure that under normal and reasonable anticipated operating conditions, there will be no need of load shedding to meet these standards.

Additionally, the ETC assigns specific reliability standards for loads on the Eyre Peninsula, with Port Lincoln being designated in the ETC as 'Category 3' which essentially requires an 'N-1' level of reliability. At present, ElectraNet meets the ETC reliability requirements for all the connection points on the lower Eyre Peninsula, but new proposed load connections will reduce this reliability.

[32] Elements of the transmission network include lines, transformers and other network equipment.

[33] Excerpt from Electricity Transmission Code, Definitions clause: "Means a system of electric lines (generally at nominal voltages of 66 kV or above) and other apparatus, equipment, plant and buildings used to convey electricity, but excluding connection assets."

Without action, key network limitations on the Eyre Peninsula are likely to be the:

- Cultana 275/132 kV transformers which have a secure thermal limit of 200 MVA; or
- Cultana to Yadnarie double-circuit transmission line, operated at 132 kV which has a secure thermal limit of 241 MVA[34]; or
- Davenport to Cultana 275 kV double-circuit transmission line which has a secure thermal limit of 597 MVA.

LILs are typically connected to Category 1 exit points. This requires that, should a contingency event occur, the load will be shed very quickly to prevent overloads of transmission network infrastructure.

Using forecast demands for the Eyre Peninsula from SA Power Networks and directly connected existing LILs, without action by 2030:

- The Cultana 275/132 kV transformer secure (N-1) rating will be reached. An additional 187 MW of LIL connections could be accommodated before reaching the transformer satisfactory (N) ratings.
- The Cultana to Yadnarie double circuit transmission line operated at 132 kV will exceed the N-1 voltage stability limits with the addition of 42 MW, larger LIL connections could be accommodated beyond this rating if they were to operate under emergency controls for the loss of a Cultana to Yadnarie line and a Cultana transformer. Emergency controls under these conditions will need to be very fast acting.
- The Davenport to Cultana secure (N-1) thermal line ratings will also be exceeded with an additional 391 MW of load.

Any of these conditions would represent shedding of load under normal and reasonably foreseeable operating conditions, which represents a reduction on the quality services provided by the transmission network. These are situations ElectraNet does not want to encounter, and this RIT-T has been undertaken to avoid them.

2.4 Assumptions underpinning the identified need

AEMO's 2024 ISP Step Change demand forecast included LILs if they meet the following commitment criteria:

- Publicly announced their Final Investment Decision and/or commenced construction
- Have obtained connection approvals with a TNSP
- Have obtained environmental approvals.

Importantly, this definition only captures loads that are very close to operation and, at the moment, there are no LIL recognised as 'committed' by AEMO in South Australia.

ElectraNet believes that more consideration should be given to other proposed LIL due to the number, scale and range of industries and proponents seeking connection (as outlined in the sections above).

[34] Due to the length of this transmission line its voltage constraint precedes the thermal one. Hence, the maximum secure (N-1) load that can be connected at Yadnarie is 120 MVA.

Due to our necessarily close communication with load proponents as part of the formal connection process, ElectraNet considers we have a closer and clearer understanding of the potential new loads and customers than AEMO. While most of this information is confidential (as these loads have not reached a financial approval and have not been publicly announced), we consider that these insights allow ElectraNet to assess the loads' connection likelihood and a possible time to connect with a greater degree of accuracy than was included by AEMO in the 2024 ISP.

AEMO has recently supported this approach, as reflected in its updated 2025 Forecasting Approach – Electricity Demand Forecasting Methodology.[35] In its updated methodology, AEMO has adopted a more granular classification of load than in the 2024 ISP. Specifically, the methodology proposes three categories for future loads: committed, anticipated and proposed. AEMO acknowledges that TNSP information is important in assessing prospective LILs (ie, anticipated and proposed loads).

Based on AEMO's proposed categories for LILs, ElectraNet considers that all the loads in Table 4 can be classified as "anticipated" – all of these loads have lodged connection enquiries with ElectraNet and are active in terms of maintaining communications and consultations with ElectraNet. Further, ElectraNet considers that the loads in Table 5 can be considered as 'proposed'.

We have therefore developed three different demand scenario forecasts as part of this RIT-T. Each scenario has been derived from the AEMO 2024 ISP Step Change forecast with adjustments made for differing views of future major load developments. ElectraNet considers that taking into account anticipated and proposed load is critical to meet the identified need, because of the delivery time difference between network and industrial load projects and the size of the potential loads.

The three demand scenarios have changed slightly from the PADR, based on updated information around their likely commencement timings and can be summarised as:

- Low scenario forecast:
  - Consists of all the existing and committed loads.
  - This includes all existing SA Power Networks connected loads and all existing directly connected customers.
- Central scenario forecast:
  - This scenario consists of all the loads in the low scenario plus the "anticipated" large industrial loads (i.e. all the loads in Table 4).
- High scenario forecast:
  - This scenario consists of all the loads in the central scenario plus the "proposed" large industrial loads that are aligned with government policy (i.e. all the proposed loads in Table 5).

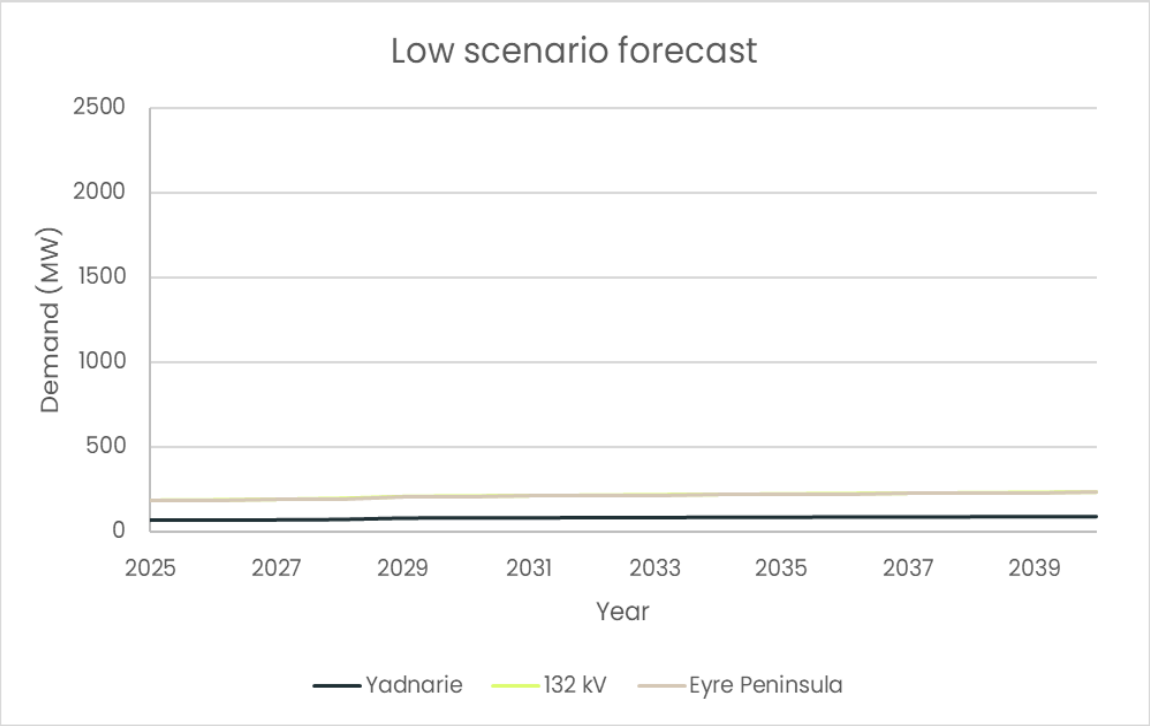
[35] AEMO, Forecasting Approach – Electricity Demand Forecasting Methodology, July 2025.

The low scenario does not include any prospective LILs and just represents SA Power Networks underlying forecast organic growth and existing LILs. For the central and high scenarios, the maximum demand forecast is driven by the LILs from 2028 onwards (with a smaller component due to SA Power Networks forecast organic growth).

The central scenario shows by 2030 demand could reach close to 500 MW, while the high scenario could reach close to 1300 MW.

The three load forecasts are shown in the figures below (and use the same scale to show the difference between them).

Figure 3 - Low scenario demand forecast[36]



[36] The demand forecast for Cultana 132 kV and the Eyre Peninsula are the same, so both traces superimpose each other.

Figure 4 - Central scenario demand forecast[37]

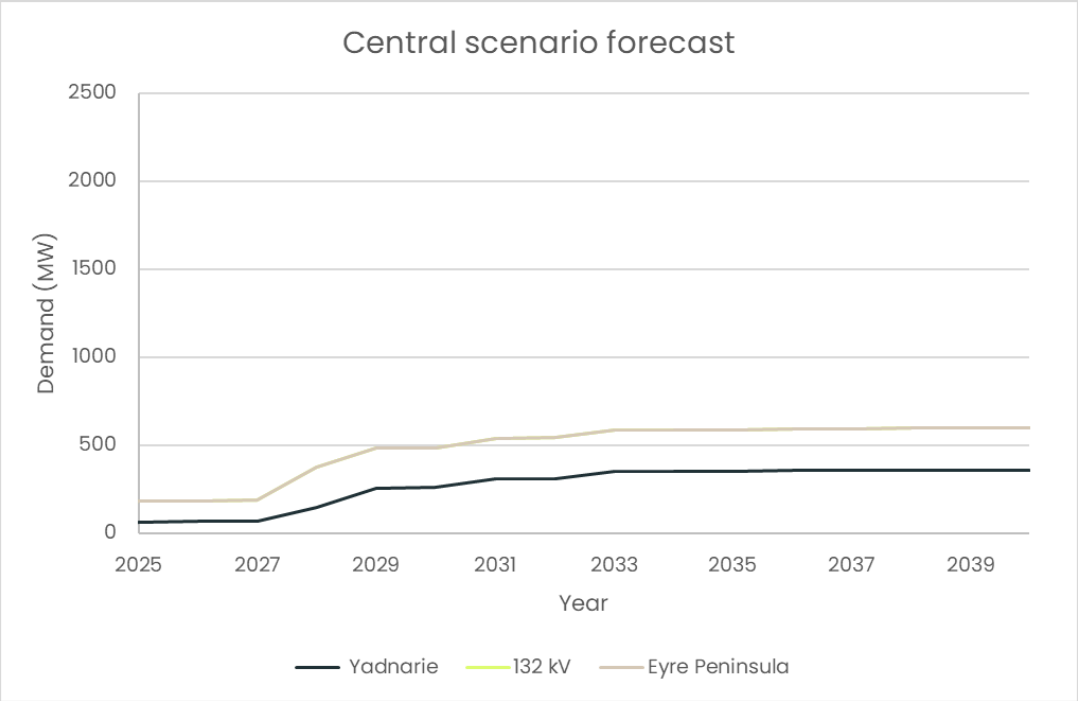
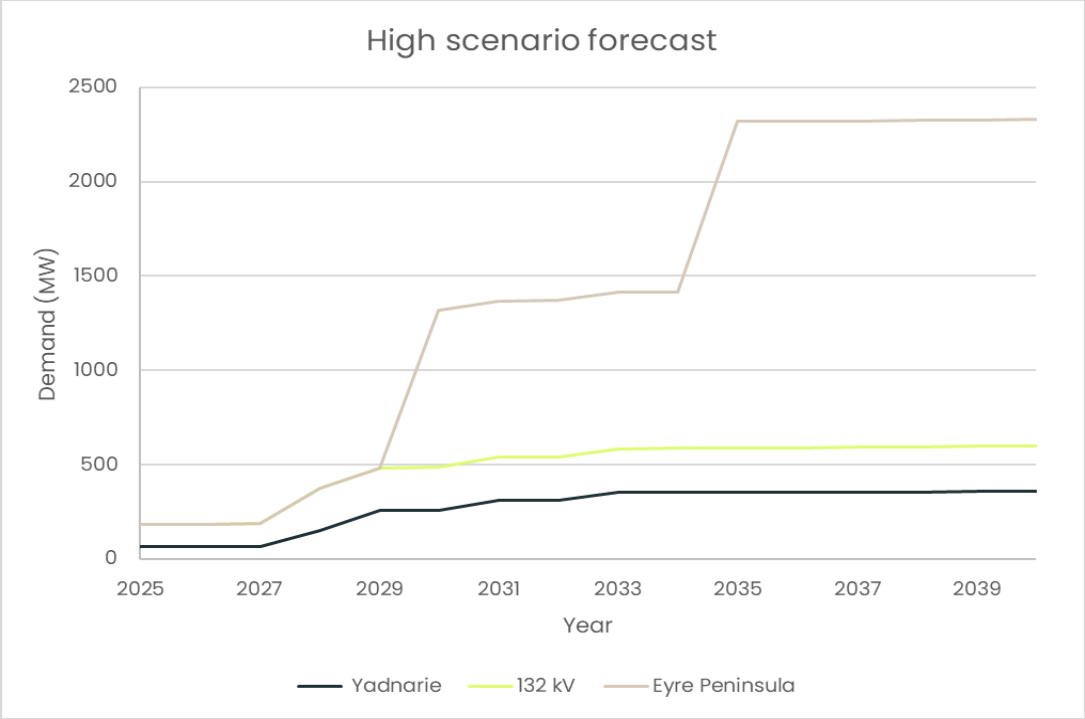


Figure 5 - High scenario demand forecast



[37] The demand forecast for Cultana 132 kV and the Eyre Peninsula are the same, so both traces superimpose each other.

The demand scenarios have not been amended to take account of the demand forecasts in the latest AEMO Electricity Statement of Opportunities (ESOO), released in August 2025. Taking account of those forecasts would likely not change the outcome but would delay the progress of this project.

Specifically, this would involve significant time and effort from AEMO, SA Power Networks and ElectraNet in order to unpack the specific LIL assumptions in the 2025 ESOO demand forecasts for the Eyre Peninsula and then review and update them for the latest information available to ElectraNet (as the party 'on the ground'). In addition, we consider that this would result in very similar demand forecasts to what have been assumed in this PACR as ElectraNet provided information to AEMO regarding potential LIL loads on the Eyre Peninsula as part of the 2025 ESOO process.

Overall, we are confident that the assumptions made regarding LIL load in the Eyre Peninsula are based on the most up-to-date and relevant information sourced directly from connecting parties.[38] Updating the base demand forecast to use the 2025 ESOO forecast is not expected to be material to the outcome of this RIT-T,[39] and thus we do not consider it a proportionate exercise to undertake under the RIT-T.

[38] We consider our approach consistent with the guidance set out in section 3.4 of the AER Guidelines.
[39] That is, doing so, is not expected to change the preferred option identified in this PACR.

3 Submissions received as part of this RIT-T

ElectraNet did not receive any submissions on the PADR.

As outlined in the PADR, ElectraNet did receive three submissions to the PSCR, one representing the Port Bonython Hydrogen Hub project supported by the South Australian government, one an equipment distributor and another a confidential industrial project developer. A summary of the points raised has been included in this PACR as Appendix E.

ElectraNet considered that the load forecast presented for the Port Bonython Hydrogen Hub project is of interest for this RIT-T and it has been included in the high demand scenario. The matters presented in the other two submissions are not material to the outcome of this RIT-T.

4 Four credible options have been assessed

We have identified four credible options to meet the identified need, depending on the location of load growth on the Eyre Peninsula. Specifically:

- Options 1, 2 and 3 are alternatives to each other and would address the possible overloading of the transformers at Cultana. These options would provide additional transfer capacity between Cultana and Yadnarie; while
- Option 4 can be implemented in combination with Options 1, 2 or 3 and would address the possible future overload of the link between Davenport and the Eyre Peninsula (Cultana/Cultana East). This option would accommodate further additional load on the peninsula.

The four options are summarised in the table below. The substance of the options has not changed since the PADR. However, as a result of further planning works and updates on potential connection timing and location for some of the anticipated LILs, we have identified the need for two complementary works that form part of the scope under Options 1, 2 and 3 and one complementary work that is part of Option 4. These are discussed further in section 4.5.

Table 7 - Summary of the credible options assessed

Option	Capacity increases, MVA		Estimated capital cost, $million 2024-25[40]
	Cultana	Yadnarie[41]	
Alternatives to each other to provide additional capacity between Cultana and Yadnarie			
Option 1 – Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation[42]	79*	480	184
Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana	200	-	42
and a capacitor bank at Yadnarie North	-	90	75
Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	79*	480	156.5
Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers	100	-	37
and a capacitor bank at Yadnarie North	-	90	75

[40] All costs and benefits quoted in this PACR are in 2024-25 dollars unless stated otherwise.
[41] The increase is based on the transmission line voltage constraint of 120 MVA.
[42] The completion of the Eyre Peninsula Link project in 2023, retained the availability to upgrade the transmission line with the construction of a double-circuit transmission line between Cultana and Yadnarie designed for 275 kV, but operated initially at 132 kV.

Option	Capacity increases, MVA		Estimated capital cost, $million 2024-25[40]
	Cultana	Yadnarie[41]	
Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	79*	480	156.5
Complementary works required under Options 1, 2 and 3			
Implement an automated voltage control scheme for the Eyre Peninsula and surrounding areas	-	-	2
May be required (central and high scenarios only) - Upgrade expected Mullaquana connection point to 275 kV	-	-	80
Option to accommodate further additional load on the peninsula			
Option 4: Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport	1,200	-	537
Complementary works under Option 4 - reconfigure connections around Cultana and Cultana East	-	-	105

* This option does not increase the capacity at Cultana, but it releases existing capacity as it transfers loads to the 275 kV network, via the new 275/132 kV Yadnarie North substation. This value is based on the present load connected to Yadnarie.

ElectraNet has not identified any non-network solution that could help address the identified need for this RIT-T. The PSCR outlined why these solutions were not expected to be able to assist. No submissions relating to non-network proposals were received in response to either the PSCR or the PADR.

4.1 Option 1 – Upgrade the Cultana to Yadnarie section to 275 kV

Option 1 is to upgrade the Cultana to Yadnarie section of the Eyre Peninsula Link from its current operation at 132 kV to 275 kV.[43]

Specifically, Option 1 involves:

- Constructing a new Yadnarie North substation with the following main characteristics:
  - connecting the Cultana-Yadnarie line to 275 kV[44]
  - transformation 275/132 kV
  - connecting Yadnarie and Port Lincoln lines to 132 kV

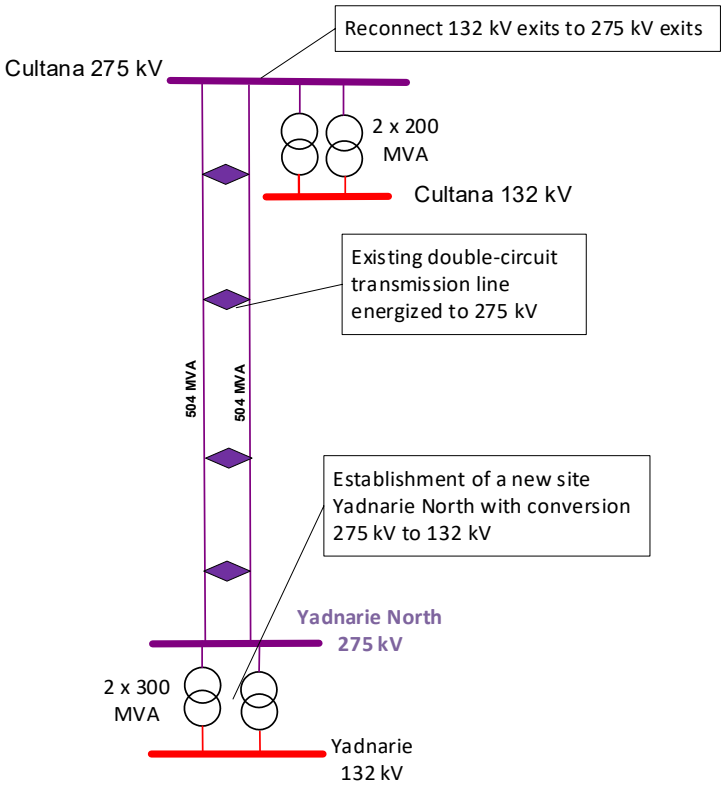
[43] This is the second stage of the preferred option from the 2017-18 RIT-T. It was referred to as 'option 4D' in the PACR for that earlier RIT-T

[44] In the approach to Yadnarie the last two spans use Golf conductor. They will have to be removed or replaced on the new approach to Yadnarie North to achieve the full rating of 607 MVA per circuit. All the other spans between Cultana and Yadnarie use Hurdles conductor @ 100C.

- Reconnecting the 132 kV exits at the existing Cultana substation on the 275 kV side.

Figure 6 presents a simplified network diagram for the substation works under Option 1.

Figure 6 - Network diagram for the works under Option 1



This option increases the secure (N-1) transfer capacity to Yadnarie to 600 MVA and release 79 MVA at Cultana 132 kV. This is the only option that increases capacity at Yadnarie and Cultana 132 kV.

The capital works associated with moving from 132 kV operation to 275 kV operation are expected to cost approximately $184.0 million and take two years to complete. This is more than expected when the previous PSCR was prepared reflecting conditions across the NEM where capital prices have increased due to a range of factors such as higher input costs (such as wages and materials) and supply chain bottle necks.

The estimated capital cost comprises:

- $13.8 million in labour costs;
- $34.5 million materials costs; and
- $135.7 million in expenses (which includes expenses in relation to contractors, design consultants, etc).

The estimated capital cost can be alternatively broken down into the option's main components:

- $132.5 million to establish Yadnarie North substation;
- $45.0 million to extend Cultana 275 kV; and
- $6.5 million to allow for realignment of the transmission line at both ends.

The assumed timing of this option under the three different demand scenarios is as follows:

- 2029/30 under the low scenario;
- 2027/28 under the central scenario; and
- 2027/28 under the high scenario.

4.2 Option 2 – Install a third transformer at Cultana and defer the upgrade of the lines between Yadnarie and Cultana

Option 2 involves two stages – namely:

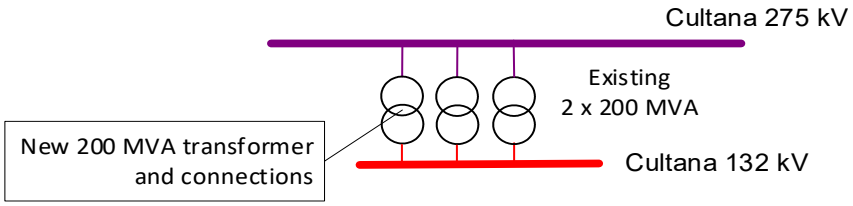
- Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana
- Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line.

Specifically, Option 2 involves, in the immediate term:

- a third transformer in one of the existing 275 kV exits at the Cultana substation
- a new 132 kV cable from the new transformer to the 132 kV Cultana bus; and
- establishment of 132 kV Yadnarie North to install a capacitor bank required to remove a voltage constraint at Yadnarie.[45]

Figure 7 presents a simplified network diagram for the substation works under Option 2.

Figure 7 - Network diagram for substation works under Option 2



This will increase the 132 kV secure (N-1) capacity at Cultana to 400 MVA. The capital works associated with the installation of the third transformer and the capacitor bank is estimated to cost $117.0 million and to take 12 months to complete (after the transformer and capacitor bank have been procured). It is expected that this will provide an additional 200 MVA of network transformation capacity at Cultana.

The estimated capital cost for stage 1 comprises:

- $12.5 million in labour costs;
- $14.0 million materials costs; and
- $90.5 million in expenses (which includes expenses in relation to contractors, design consultants, etc).

[45] During outage of one of the Cultana-Yadnarie 132 kV circuits, the maximum load allowed to connect to Yadnarie will be 120 MW due to voltage collapse. A 60 MVArs capacitor bank (4 x 15 MVArs) will resolve the issue, allowing loads up to 210 MW.

The estimated capital cost for stage 1 can be alternatively broken down into the option's main components:

- $42.0 million to add a third 200 MVA transformer at Cultana; and
- $75.0 million to establish Yadnarie North 132 kV and install capacitor bank.

Option 2 (stage 1) is expected to take as long as Option 1 (and Option 3) to commission and so is not expected to deliver benefits any sooner.

As discussed above, a third transformer at Cultana and the capacitor bank at Yadnarie North will defer the need to upgrade the Cultana to Yadnarie section of the Eyre Peninsula Link to 275 kV. This will only be possible if most of the additional load at 132 kV is connecting to Cultana and not south of it. However, ElectraNet expects several large industrial loads connecting south of Yadnarie within a time span of 1 or 2 years. This will require upgrading the transmission line (Option 2 - stage 2) in close succession to the time the additional transformer is installed.

One drawback of this option is that it would use one of the remaining exits at the Cultana substation. It is already likely that all the current available exits may be needed to accommodate future network expansion, including the upgrade of the Cultana-Yadnarie line. This might be required to meet load growth in the broader area (including potentially to accommodate future projects such as Port Bonython hydrogen export hub near Whyalla) increasing the costs of those future developments.

Option 2 (stage 2) includes the upgrade of the Cultana-Yadnarie transmission line when required. This includes the completion of the Yadnarie North with the installation of transformers and the connection to 275 kV. This will increase the secure (N-1) transfer capacity to Yadnarie to 600 MVA. The total cost of the upgrading is $156.5 million. Analysis of this variation includes an analysis of the value of the deferment made possible by installing a third transformer and the estimated value of higher losses on the 132 kV network. To the extent that this variation also involves the upgrade of the line itself the analysis will be based on the same assumptions made for Option 1.

The estimated capital cost for stage 2 comprises:

- $17.5 million in labour costs;
- $39.0 million materials costs; and
- $100.0 million in expenses (which includes expenses in relation to contractors, design consultants, etc).

The estimated capital cost for stage 2 can be alternatively broken down into the option's main components:

- $95.0 million to complete Yadnarie North transformation substation;
- $55.0 million to extend Cultana 275 kV; and
- $6.5 million to allow for realignment of the transmission line at both ends.

We expect the third transformer would remain at Cultana even after the Cultana to Yadnarie section is upgraded to 275 kV, as the cost of removing/relocating it is expected to be prohibitively high. The third transformer would have no impact on the capacity of the line south of Cultana after the upgrade, but it would increase the 132 kV capacity at Cultana.

Depending on the location of new loads and generation, there is a possibility the third transformer will become a stranded asset with no used capacity after the upgrade.

The assumed timing of this option under the three different demand scenarios is as follows:

- 2029/30 under the low scenario for stage 1;
- 2027/28 under the central scenario for stage 1 and 2028/29 for stage 2; and
- 2027/28 under the high scenario for stage 1 and 2028/29 for stage 2.

4.3 Option 3 – Replace the Cultana transformers and defer the upgrade of the lines between Yadnarie and Cultana

Similar to Option 2, Option 3 is a staged option and involves two stages – namely:

- Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers; and
- Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line

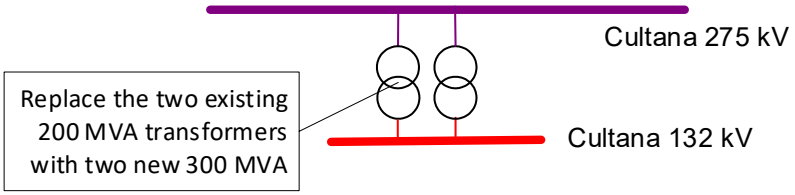
Option 3 is similar to Option 2 in that additional transformer capacity is used in the first instance to defer the ultimate upgrade of the Cultana to Yadnarie section of the Eyre Peninsula Link from 132 kV to 275 kV. The difference is that Option 3 involves replacing the two existing 200 MVA transformers at Cultana with two 300 MVA transformers, rather than adding a third transformer.

Figure 8 presents a simplified network diagram for the substation works under Option 3.

Specifically, Option 3 involves, in the immediate term:

- Replacing the existing Cultana 200 MVA transformers with 300 MVA transformers
- Replace connecting equipment for these transformers to accommodate the higher capacity transformers
- Establishment of 132 kV Yadnarie North to install capacitor banks required to remove a voltage constraint at Yadnarie[46]

Figure 8 - Network diagram for the substation works under Option 3



The capital works associated with replacing the two existing transformers and installing the capacitor bank are estimated to cost $112.0 million and to take 12 months to complete (after the transformers and capacitor bank have been procured). This will increase the 132 kV secure (N-1) capacity at Cultana to 300 MVA.

[46] During outage of one of the Cultana-Yadnarie 132 kV, the maximum load allowed to connect to Yadnarie will be 120 MW due to voltage collapse. A 60 MVArs capacitor bank (4 x 15 MVArs) will resolve the issue, allowing loads up to 210 MW.

The estimated capital cost for stage 1 comprises:

- $12.5 million in labour costs;
- $25.0 million materials costs; and
- $74.5 million in expenses (which includes expenses in relation to contractors, design consultants, etc).

The estimated capital cost for stage 1 can be alternatively broken down into the option's main components:

- $37.0 million to upgrade/replace transformers at Cultana; and
- $75.0 million to establish North Yadnarie 132 kV and install capacitor bank.

As with Option 2, given current procurement lead-times we expect that the total time to procure and commission the two new transformers and the capacitor bank would be similar as for upgrading the line under Option 1. Therefore, we do not expect that Option 3 would deliver benefits sooner than either Option 1 or Option 2.

Option 3 (stage 1) involves replacing the transformers at Cultana and could defer the need to upgrade of the Cultana to Yadnarie section of the Eyre Peninsula Link to 275 kV, but not prevent it entirely. This will only be possible if most of the additional load at 132 kV is connecting to Cultana and not south of it. However, large industrial loads are expected to connect south of Yadnarie within a time span of 1 or 2 years. This will require upgrading the transmission line in close succession to the time the two transformers are replaced.

Hence, the variation Option 3 (stage 2) would be required to upgrade the Cultana-Yadnarie transmission line at a later time. This variation is the same as Option 2 (stage 2), with the same scope of works, transfer capacity and estimated costs of $156.5 million.

Therefore, as with Option 2, analysis of this variation amounts to study the value of the deferment made possible by upgrading the two existing transformers at Cultana. To the extent that this option also involves the (later) upgrade of the line itself, the analysis will be based on the same assumptions made for Option 1. Once the line is upgraded there will be a surplus of transformation capacity at Cultana, as the load at Cultana 132 kV will be reduced.

Option 3 has the advantage of keeping all the current spare exits at the Cultana substation available for future network developments.

The assumed timing of this option under the three different demand scenarios is as follows:

- 2029/30 under the low scenario for stage 1;
- 2027/28 under the central scenario for stage 1 and 2028/29 for stage 2; and
- 2027/28 under the high scenario for stage 1 and 2028/29 for stage 2.

4.4 Option 4 – Duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport

Option 4 is to upgrade the Davenport to Cultana section of the Eyre Peninsula Link to deliver more power from Davenport to Cultana East/Cultana. This option may be required in combination with another option.

Connectivity to Davenport is restricted as only one exit is available and it is not possible to extend the site. In the past, a new Davenport South future site had been considered. However, a new site south of Davenport would have some complications:

- Connecting to Cultana East/Cultana would require one of two options:
  - Crossing the Spencer Gulf, which represents a transmission line section with more stringent design requirements, high exposure to sea environment and a higher risk of loss of load because of longer times to repair, or;
  - A long transmission line around the gulf, avoiding the crossing. Establishing a corridor for this line could be challenging as indicated below.
- It will be difficult to establish new transmission corridors north of the future site due to the localities of Port Augusta and Stirling North. Similarly, on the east direction it would be restricted by existing and emerging solar farms. This will reduce the alternatives to connect to the network and would gridlock the future site.
- Any new transmission line connecting to the future site would have to cross several existing transmission lines
- It does not provide geographic diversity, as it will be very close to Davenport.
- A south location, closer to shore increases the future risks due to climate change, rising sea levels and coastal inundation.[47]

ElectraNet considers a new site north of Davenport could be a better choice. This new site connection could be located around 30 km North-West of Davenport, in the vicinity of Narcoona. A site at this location could become a switching hub, facilitating the connection to Davenport, BHP, the Eyre Peninsula and the Mid-North.

Specifically, Option 4 involves, in the immediate term:

- Establishing a new site called Narcoona approximately 30 km north of Davenport.
- Expansion of Cultana East at 275 kV.
- Build a 275 kV double circuit transmission line between Davenport to Narcoona, with an approximated length of 30 km and rated around 600 MVA per circuit (or higher).[48]
- A new double circuit 275 kV overhead transmission line between Narcoona and Cultana East, of approximately 70 km and rated at around 600 MVA[49] per circuit (or higher).

The new 275 kV circuits will connect to our new Cultana East substation (in the proximity of Cultana) to diversify and strengthen the supply and connection to the Eyre Peninsula.

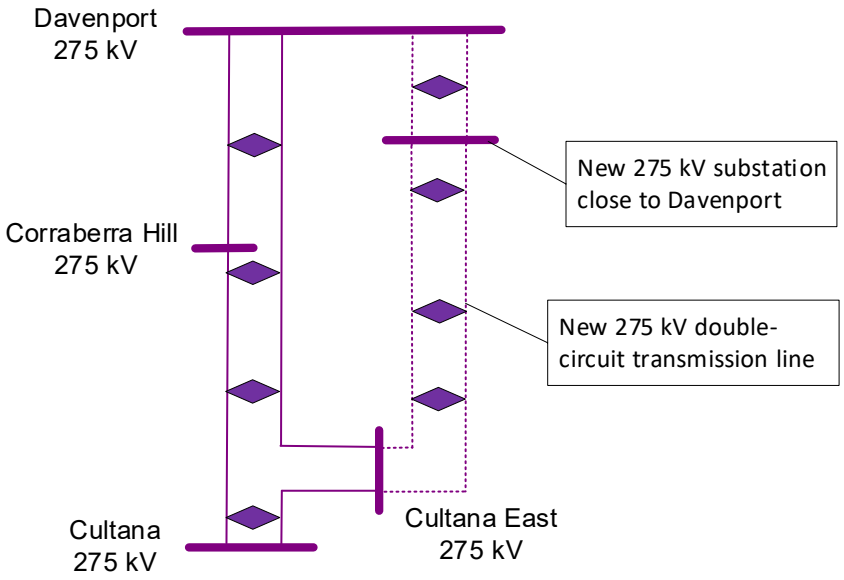
Figure 9 presents a simplified network diagram for the substation works under Option 4.

[47] By mid-century sea levels are projected to rise around 24 cm along the South Australia coast. Department of Environment and Water SA. Guide to climate projections for risk assessment and planning in South Australia 2022.

[48] We are investigating the possibility of using portions of existing 275 and/or 132 kV circuits leaving Davenport as part of these new circuits. The existing circuits follow the proposed route between the two sites for some kilometres and using them would reduce the length of conductor and number of structures required for the new transmission line.

[49] Depending on the evolution of future demand in the Eyre Peninsula it could be necessary to increase the rating of these circuits.

Figure 9 - Network diagram for the works under Option 4



The capital works associated with this option are around $537.0 m and this project would have a lead time of around 4 years from the time the RIT-T is concluded, and Final Investment Decision (FID) is made. This could be accelerated with commitment from load. This project would increase the secure (N-1) transfer capacity from Davenport to Cultana from estimated 600 MW to around 1,800[50] MW.

The estimated capital cost comprises[51]:

- $68.0 million in labour costs;
- $87.0 million materials costs; and
- $362.0 million in expenses (which includes expenses in relation to contractors, design consultants, etc).
- $20.0 million for land acquisition and easements.

The estimated capital cost can be alternatively broken down into the option's main components:

- $116.0 million to establish new 275 kV Narcoona substation;
- $90.0 million for new double circuit 275 kV transmission line between Davenport and Narcoona;
- $28.0 million for existing 275/132 kV transmission lines reconfiguration leaving Davenport;
- $210.0 million for new double circuit 275 kV transmission line between Narcoona and Cultana East; and
- $93.0 million to extend Cultana East 275 kV

The assumed timing of this option under the three different demand scenarios is as follows:

[50] This assumes the new 275 kV circuits have a similar rating to the existing, approximated 600 MVA each circuit.
[51] The establishment of the new substation will require land acquisition. We have assumed $1m as it cost, but this will need reassessing once a more precise location is selected and corresponding community engagement is progressed.

- It is not required over the assessment period under the low scenario;
- 2037/38 under the central scenario; and
- 2030/31 under the high scenario.

4.5 Additional works

4.5.1 Common to Options 1, 2 and 3

As a result of further planning works since the PADR and updates to potential connection timing and location for some of the anticipated LILs, we have identified the need for two complementary works, which are required alongside the other investment components of Options 1, 2 and 3. The cost of these works has been included as part of the cost of these options in the NPV assessment presented in this PACR.

Automated voltage control scheme

The forecast demand growth on the Eyre Peninsula is expected to lead to increased complexity in managing the voltage profile in this part of the network, under each of the options being considered in this RIT-T.

As a consequence, ElectraNet has identified that there is the need of an automated voltage control scheme to ensure the efficient and timely management of the complex voltage profile along the Eyre Peninsula and portions of the Upper North region. This scheme is required to facilitate compliance with the voltage limits stipulated by the NER and in connection agreements, with both SA Power Networks and direct connect customers.

The control scheme would monitor and automatically adjust voltages, helping to maintain quality, reliability and security of supply, while minimising the need for human intervention and reducing transmission losses.

The scheme would automatically adjust tap changers position on transformers at various locations in the Eyre Peninsula and the Upper North regions of the network and it would signal changes and status back to the SCADA system.

These works would be included as part of Options 1, 2 and 3. Under Options 2 and 3, the automated voltage control scheme would be implemented as part of the first stage of these options.

The estimated capital cost of these works is $2.0 million (2024-25).

Upgrade of the Mullaquana point of connection from 132 kV to 275 kV

Following additional planning studies and engagement with prospective LILs in the area, ElectraNet considers that a Mullaquana point of connection will likely be established and need to be upgraded from 132 kV to be a 275 kV point of transformation, to facilitate load growth from existing and new connections in that area. In the absence of this upgrade, new LILs in this area would face a first mover disadvantage in needing to fund the upgrade works as part of their connection costs, once the Cultana - Yadnarie line has been upgraded to 275 kV. Given the proximity of several prospective and existing LILs to Mullaquana, ElectraNet considers that it is appropriate include this point of transformation as part of the shared network, to establish a new connection point at Mullaquana.

This upgrade is required for Options 1, 2 and 3 under the central and high scenarios (and occurs at the same time as the line upgrade). The low scenario demand forecast does not require this upgrade, as it does not include substantial new load in this area.

The estimated capital cost of these works is $80.0 million (2024-25). ElectraNet will reassess the progression of connections in this area at the contingent project application stage and decide whether to include this capital expenditure in this application at that point in time, or whether it should be subject to a separate, later contingent project application.

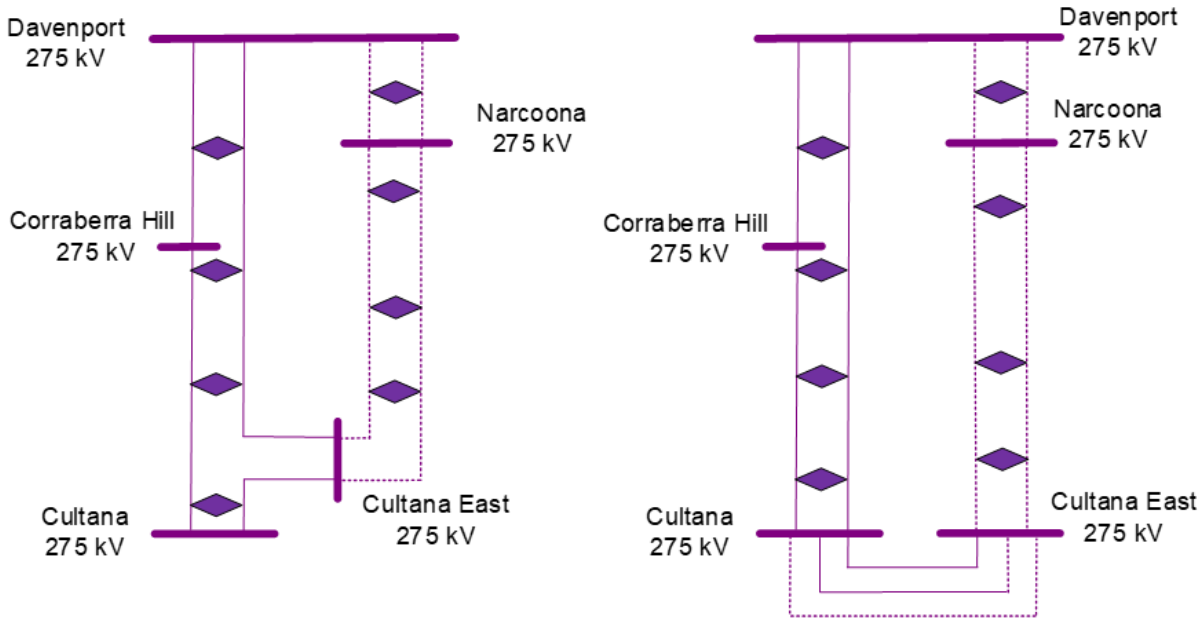
4.5.2 Additional works for Option 4

Under Option 4, the two new 275 kV circuits connecting the Eyre Peninsula to Narcoona will connect to our new Cultana East substation. This allows for diversification and strengthening of supply to the Eyre Peninsula.

To increase the reliability, resilience and strength of the link between the Eyre Peninsula and the rest of the network we plan to reconfigure the 275 kV connections between Cultana and Cultana East. This will remove the in-out connection of one of the 275 kV Davenport-Cultana circuits to Cultana East, reinstate the direct connection to Cultana of this circuit and strengthen the connection between Cultana and Cultana East.

Figure 10 shows the initial network configuration after completion of Option 4 (on the left) and the final configuration after the additional works (on the right).

Figure 10 – Network reconfiguration as a result of additional works (Before -LHS - and after -RHS)



The estimated capital cost of these works is $105.0 million (2024-25). This cost has been included as part of Option 4 in the NPV assessment presented in this PACR.

4.6 Options considered but not progressed

We have also considered a range of other options but have not progressed these on the grounds that they are not considered feasible and therefore are not credible options.

A summary of these options is provided in the table below.

Table 8 - Summary of options considered but not progressed

Option	Overview	Reason(s) it has not been progressed
Only install the third transformer at Cultana	Option 2 but without the ultimate line upgrade to 275 kV.	A third transformer alone would not provide sufficient capacity to meet the identified need for most new connections. It would therefore involve additional costs without commensurately reducing expected unserved energy base case and losses for Eyre Peninsula generators and so is not considered economically feasible.
Only upgrading the Cultana transformers	Option 3 but without the ultimate line upgrade to 275 kV.	Upgrading the Cultana transformers alone would not provide sufficient capacity to meet the identified need for most new connections. It would therefore involve additional costs without commensurately reducing expected connection costs in the base case and losses for Eyre Peninsula generators and so is not considered economically feasible.
Commission a new 132 kV double-circuit line between Cultana and Yadnarie	Duplicate the existing 132 kV line, or parts of it.	This would cost considerably more than any of the credible options outlined above but would not provide any additional market benefits. This option is therefore not considered economically feasible. Additionally, it will require the addition of more transformer capacity at Cultana.
'Option 5' from the PSCR – duplicate the Cultana to Yadnarie North 275 kV circuits	Duplicate the existing transmission line	This would represent a considerable cost and with the information we have at the moment, there are not proposed future loads that could require this duplication. None of the load forecasts included in this report supports this capacity increase in the studied time period.

5 Estimating market benefits

This section outlines the two categories of market benefit we expect to be material for this RIT-T, as well as how they have been estimated. It presents the same material as section 5 of the PADR.

5.1 Two 'market benefit categories' could be material

The NER require that all categories of market benefit identified in relation to the RIT-T are included in the RIT-T assessment unless the NSP can demonstrate that they are unlikely to be material in relation to the RIT-T assessment for a specific option.

The only two categories of market benefit under the RIT-T that could be material are:

- changes in involuntary load shedding – due to each option being able to avoid different levels of unserved energy under the base case; and
- changes in network losses – due to the different capacity options resulting in different levels of electrical losses on the peninsula.

Both have been modelled using PLEXOS and included in the PACR assessment.

While all options are also expected to deliver significant other market benefits compared to the base case[52] (e.g. through improving the efficiency of wider wholesale market build and operational decisions), these impacts are not expected to be materially different across the options and so have not been estimated.

In addition, while Options 2-3 exhibit flexibility in terms of their ability to defer the upgrade of the Cultana to Yadnarie line until a time that sufficient future load becomes committed, we have captured the option value of this flexibility implicitly through considering scenarios in which the line upgrade is not required initially. This approach is consistent with the AER guidance on the treatment of option value. We consider that a wider option value modelling exercise would be disproportionate to any option value that may be identified for this specific RIT-T assessment.

While involuntary load shedding and losses have been estimated, analysis has shown differences between all the options are actually small for the central and high demand scenarios. This is because Option 2 and 3 require upgrading the transmission line just one year after the transformer upgrades, which corresponds to one year after the upgrade of the line for Option 1. Hence, all options operate for most years with the upgraded transmission line making the involuntary load shedding and losses amounts effectively the same between the options, for most of the analysis period, except for a couple of years.

The low demand scenario shows similar small quantities of involuntary load shedding for all options at the end of the analysis period. For this scenario the main difference is between Option 1 and Options 2 and 3. Option 1 is the only one upgrading the transmission line and therefore its losses are small compared to the other options.

[52] See Section 6.1

All avoided involuntary load shedding has been valued at a weighted VCR of $20,970 per MWh. This VCR was calculated using the South Australian residential VCR and the VCRs for industrial, mining and services determined by the AER[53]. We do not expect that adopting the soon-to-be-released 2025 AER VCR values would materially affect the outcome of this RIT-T.

Our PLEXOS model is based on a detailed representation of our network, which includes the individual transmission lines and their respective parameters, such as resistance. This allows for a direct calculation of the losses for each transmission line. For each demand scenario and option, a PLEXOS simulation was carried out, and losses were calculated for the relevant assets. Then the cost of the losses was calculated assuming a value of $62/MWh, which represents the marginal fuel cost, based on approximated future contract pricing[54].

5.2 PLEXOS has been used to estimate market benefits categories

At ElectraNet, we have developed an internal PLEXOS market model to assess the market benefits expected to arise for each of the options.

This market modelling has been conducted using a detailed model of ElectraNet's transmission network, which allows for more granular analysis and produces results more directly related to the real network.

For the purposes of the market modelling, ElectraNet defines two sets of market modelling inputs – namely:

- 'Common' assumptions – these are assumptions that apply across all scenarios and model runs, e.g., generator technical and financial parameters, the stringency of jurisdictional Renewable Energy Targets and capital costs of new entrant generators; changes in involuntary load shedding – due to each option being able to avoid different levels of unserved energy under the base case; and
- 'State of the world' assumptions – these are the assumptions that define each 'state of the world' modelled in the option value analysis, i.e., 'a low demand world' vs. a 'high demand world' and a specific option.

For the purposes of this RIT-T, ElectraNet has only modelled outcomes under the 2024 ISP Step Change scenario.

Other 2024 ISP scenarios differ across a range of parameters. However, these differences principally affect the estimation of wholesale market benefits and, since no categories of wholesale market benefit are material to the NPV assessment of the two credible network options included in this PACR, adopting a single ISP scenario approach is considered appropriate.

[53] AER Australian Energy Regulator, Values of customer reliability – final report on VCR values, Dec. 2024.

[54] This calculation uses AEMO's 2023 Inputs, Assumptions and Scenarios Report (IASR) to estimate the marginal fuel cost as it was the latest available final IASR at the time the modelling for this RIT-T was undertaken. We have not updated the estimate using the recently released 2025 IASR and we do not consider it proportionate to do so (i.e., it will not change the ranking of the options).

6 Overview of the assessment approach

This section outlines the approach that ElectraNet has applied in assessing the net benefits associated with each of the credible options against the base case. It presents the same material as included in section 6 of the PADR.

6.1 The base case 'do nothing' option

Consistent with the RIT-T requirements, the assessment undertaken in the PACR compares the costs and benefits of each option to a base case 'do nothing' option. The base case is the (hypothetical) projected case if no action is taken, i.e.:[55]

> *"The base case is where the RIT-T proponent does not implement a credible option to meet the identified need, but rather continues its 'BAU activities'. 'BAU activities' are ongoing, economically prudent activities that occur in absence of a credible option being implemented"*

Under the base case, the existing shared transmission infrastructure on the Eyre Peninsula is assumed not to change going forward. While this RIT-T has been initiated to be able to accommodate future load increases, the assessment is required to use a "do nothing" base case as a common point of reference when estimating the net benefits of each credible option.

The connection of new loads under the base case would be constrained by the existing ratings in the network. These restrictions would limit the loads that can connect and the operation of those that are able to connect, which would result in increasingly frequent unserved energy.

These are not situations ElectraNet plans to encounter, and the NER obligations and this RIT-T have been initiated specifically to avoid them.

6.2 General cost benefit analysis parameters adopted

The RIT-T analysis considers a 20-year assessment period from 2024-25 to 2043-44. A 20-year period considers the size, complexity and expected lives of the options and provides for a reasonable indication of the costs and benefits over a long outlook period.

Where the capital components of the credible options have asset lives extending beyond the end of the assessment period, the NPV modelling includes a terminal value to capture the remaining asset life. This ensures that the capital cost of long-lived options over the assessment period is appropriately captured, and that all options have their costs and benefits assessed over a consistent period – irrespective of option type, technology or asset life. The terminal values have been calculated as the undepreciated value of capital costs at the end of the analysis period.

A real, pre-tax discount rate of 7 per cent has been adopted as the central assumption for the NPV analysis presented in this PACR, consistent with the assumptions adopted in the latest 2025 IASR and AEMO ISP Step Change scenario. The RIT-T also requires that sensitivity testing be conducted on the discount rate and that the regulated weighted average cost of capital

[55] AER, *Regulatory Investment Test for Transmission Application Guidelines,* August 2020, p. 21.

(WACC) be used as the lower bound. ElectraNet has therefore tested the sensitivity of the results to a lower bound discount rate of 4.18 per cent,[56] and an upper bound discount rate of 10 per cent (being the upper bound in the latest 2025 IASR).

6.3 Approach to estimating costs

ElectraNet has prepared capital cost estimates reflecting the AACE cost estimate classification system, level AACE class 4 for the credible network options in this RIT-T. The class 4 estimates are of an expected accuracy of +50%/-30%.

Capital cost estimates have been derived from a high-level desktop review of required scope prepared by ElectraNet's asset engineering team and/or single line diagrams prepared by ElectraNet's network planning team.

The estimates have been obtained following ElectraNet's standard procedure, using data from our estimating database in conjunction with latest costs from recent projects. No explicit contingency allowance has been added to the estimates, though we note that estimates are accurately interpreted as ranges rather than the point estimates used in the analysis presented in this PACR.

The estimates include some basic costs related to the acquisition of land and easements. Based on the present option scopes and their respective costing estimates, we have concluded that the expected costs of these items will not be material when compared with the total option cost and so they do not need to be considered in detail at this stage.

All cost estimates were prepared in real, 2024/25 dollars based on the information and pricing history available to ElectraNet at the time that they were estimated.

The capital cost estimates in this PACR differ from the ones in the PADR as they have been reviewed and updated based on new information from consultants, suppliers and contractors. Additionally, complementary works have been included into the scope (and therefore the total cost) of all the options. For Options 1, 2 and 3 the additional works could result on an increase in estimated costs of $82.04 million if both components are required. For option 4 the additional works increase the estimate by $105.0 million.

The specific capital cost estimates are presented in the next section.

Additionally, for the NPV analysis ElectraNet has assumed for each option that 1 % of its initial capital cost represents the yearly cost incurred to operate and maintain the assets across their lifespan. While this assumed percentage has been updated since the PADR due to further assessment, it is not a material change and has no bearing on the identification of the preferred option overall.

[56] This is equal to WACC (pre-tax, real) in the latest final decision for a transmission business in the NEM (Directlink) as of the date of this analysis, see: AER, April 2025, Directlink – 2025-30 – Final decision – PTRM. It has been updated from the 3.63% used in the PADR.

6.4 Costs estimates for credible options

Table 9 - Estimated costs for credible options (Class 4, +50%/-30%)

Option	Estimated capital cost, $million 2024-25[57]
Alternatives to each other to provide additional capacity between Cultana and Yadnarie	
Option 1 – Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation[58]	
Establish Yadnarie North substation (275/132 kV)	132.5
Extend 275 kV switchyard at Cultana	45
Realignment of the transmission line at both ends	6.5
Option 1 - Total	**184**
Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana and a capacitor bank at Yadnarie North	
Add a third 200 MVA 275/132 kV transformer at Cultana	42
Establish the 132 kV switchyard at Yadnarie North and install capacitor bank	75
Option 2 (Stage 1) - Total	**117**
Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line to 275 kV	
Complete establishment of Yadnarie North 275/132 kV	95
Extend Cultana 275 kV switchyard	55
Realignment of the transmission line at both ends	6.5
Option 2 (Stage 2) - Total	**156.5**

[57] All costs and benefits quoted in this PACR are in 2024-25 dollars unless stated otherwise.
[58] The completion of the Eyre Peninsula Link project in 2023, retained the availability to upgrade the transmission line with the construction of a double-circuit transmission line between Cultana and Yadnarie designed for 275 kV, but operated initially at 132 kV.

Option	Estimated capital cost, $million 2024-25[57]
Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers	
Replace the 275/132 kV transformers at Cultana with 300 MVA transformers	37
Establish the 132 kV switchyard at Yadnarie North and install capacitor bank	75
Option 3 (Stage 1) - Total	**112**
Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line to 275 kV	
Complete establishment of Yadnarie North 275/132 kV	95
Extend Cultana 275 kV switchyard	55
Realignment of the transmission line at both ends	6.5
Option 3 (Stage 2) - Total	**156.5**
Additional works common to Options 1, 2 and 3	
Automated voltage control	2.0
May be required (under the central and high scenarios only) - Upgrade Mullaquana connection point to 275 kV	80

Option	Estimated capital cost, $million 2024-25[57]
Options to accommodate further additional load on the Eyre Peninsula	
Option 4 – Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport	
Establish a new 275 kV substation close to Narcoona	116
Construct a new double circuit 275 kV transmission line between Davenport and Narcoona	90
Reconfigure existing 275 kV circuit leaving Davenport	28
Construct a new double circuit 275 kV transmission line between Narcoona and Cultana East	210
Extend the 275 kV switchyard at Cultana East	93
Option 4 - Total	**537**
Additional works for Option 4	
Reconfiguration of 275 kV network around Cultana/Cultana East	105

6.4.1 Additional complementary works

ElectraNet has estimated the costs for the additional works that have been identified for each of the options since the PADR using the same methodology described in the previous section.

A breakdown of the costs associated with the three additional works is set out in Table 10.

Table 10 - Additional works cost (Class 4, +50%/-30%)

Additional works common to Options 1, 2 and 3	Estimated capital cost, $million 2024-25[59]
Automatic voltage control	
Factory and site acceptance testing	0.85
Construction and outage planning	0.65
Contractor project management	0.5
Total	**2.0**
May be required - Upgrade Mullaquana connection point to 275 kV	
Establish a new 275 kV switchyard, populate three exits and install a 200 MVA 132/275 kV transformer	74.4
Reconfigure to cut-in on one of the upgraded 275 kV Cultana – Yadnarie North circuits.	5.6
Total	**80**
Additional works for Option 4	**Estimated cost, $million**
Reconfiguration of 275 kV network around Cultana/Cultana East	
Extend the 275 kV switchyard at Cultana and completion of single line connection between Cultana and Cultana East	73.8
Cultana lines reconfiguration	9.5
Construct a new 275 kV single circuit transmission line between Cultana and Cultana East	21.5
Total	**105**

[59] All costs and benefits quoted in this PACR are in 2024-25 dollars unless stated otherwise.

7 Net present value analysis

This section outlines the results of the economic assessment we have undertaken of the credible options. The analysis has been updated since the PADR to reflect the revised costs of the options (including the costs of the additional complementary works), as well as the updated assumed load commencement timings and revised operating cost assumption.[60]

Our analysis has shown that, using the three demand scenarios described in this PACR, the delivery time of the options is as shown in the table below.

Table 11. Delivery times for the options based on the load scenario

Option	Low	Central	High
*Alternatives to each other to provide additional capacity between Cultana and Yadnarie**			
Option 1 – Develop the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation	2029/30	2027/28	2027/28
Option 2 (Stage 1) – Add a third 200 MVA transformer at Cultana	2029/30	2027/28	2027/28
Option 2 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	-	2028/29	2028/29
Option 3 (Stage 1) – Replace the transformers at Cultana with 300 MVA rated transformers	2029/30	2027/28	2027/28
Option 3 (Stage 2) – Upgrading the Cultana-Yadnarie transmission line	-	2028/29	2028/29
Option to accommodate further additional load on the peninsula			
Option 4: Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport	-	2037/38	2030/31

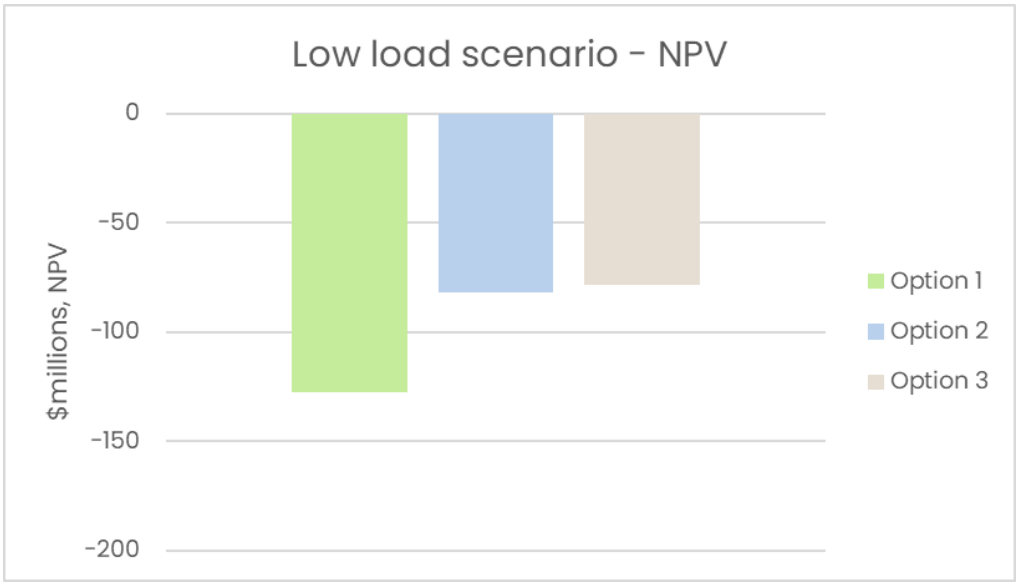
* Options 1, 2 and 3 include the associated complementary works, where required, on the same timing.

7.1 Low demand scenario

This scenario assumes all existing and committed loads. This includes all existing SA Power Networks connected loads and all existing directly connected customers.

[60] The lower bound discount rate sensitivity has also been updated to reflect the latest final decision for a transmission business in the NEM (Directlink) as of the date of this analysis. See section 5.5.

Figure 11. NPV for the low demand scenario



Under this scenario, the network is required to be upgraded by 2029/30. Options 2-3 only require stage 1, as the only constraint binding would be the transformers at Cultana, and Option 4 is not needed.

Figure 11 shows the NPV for Options 1, 2 and 3 and demonstrates that the options that upgrade the transformers at Cultana (ie, Options 2 and 3) are more competitive than developing the Yadnarie North substation to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation (Option 1). The respective NPVs are Option 1: -$127.44 m, Option 2: -$82.17 m and Option 3: -$78.82 m.

Figure 12 presents a breakdown of costs and benefits under the low demand scenario calculated in present value terms.

Figure 12. Breakdown costs and benefits for the low load scenario

7.2 Central demand scenario

This scenario consists of all the loads in the low scenario plus the "anticipated" large industrial loads.

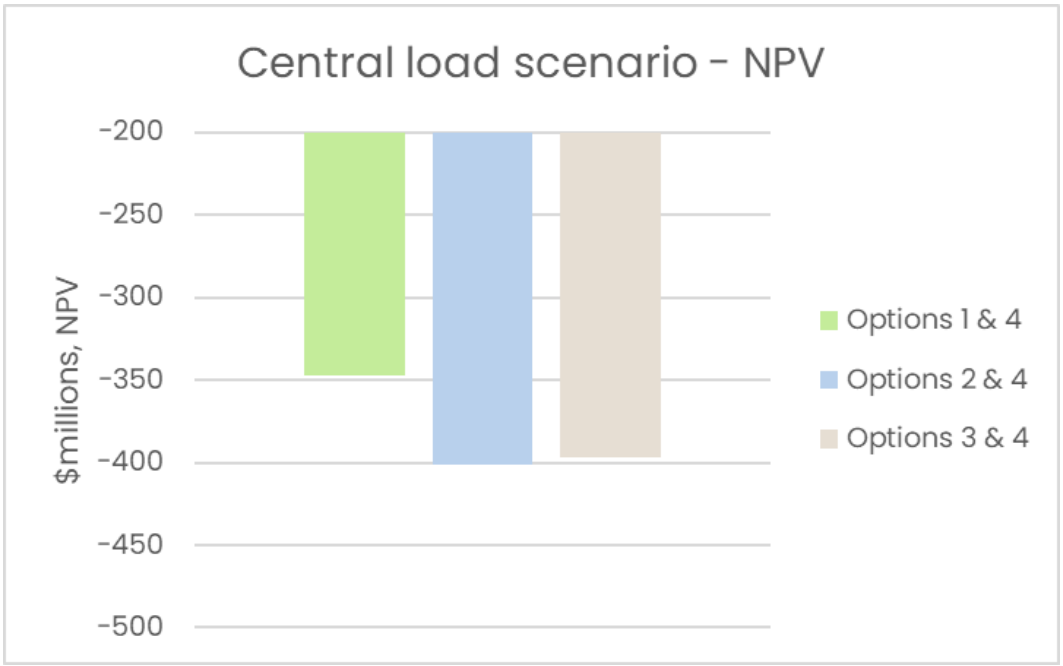
Under this scenario, Options 2-3 require implementing both stages, whereas under the low demand scenario only Stage 1 is required for both options. Also:

- Stage 1 is undertaken two years earlier for both options than under the low demand scenario; and
- because of the demand increases south of Cultana, both options must upgrade the transmission line between Cultana and Yadnarie (Stage 2) one year after the transformer is upgraded (Stage 1).

Furthermore, because the demand increases across the whole Eyre Peninsula in this scenario, the connection to the rest of the network is required to be upgraded and so Option 4 must be implemented under all options by 2037/38.

Figure 13 shows the NPV for the options and indicates that Option 1 + Option 4 is ranked above the other two. The respective NPVs are Option 1 + Option 4: -$347.51 m, Option 2 + Option 4: -$400.95 m and Option 3 + Option 4: -$396.89 m.

Figure 13. NPV for central demand scenario



The inclusion of Option 4 in all the other options explains the large difference between the NPV for the low demand scenario and this central demand scenario.

Figure 14 presents a breakdown of costs and benefits under the central demand scenario calculated in present value terms.

Figure 14. Breakdown costs and benefits for the central load scenario

7.3 High demand scenario

This scenario consists of all the loads in the central demand scenario plus the "proposed" large industrial loads that are aligned with government policy.

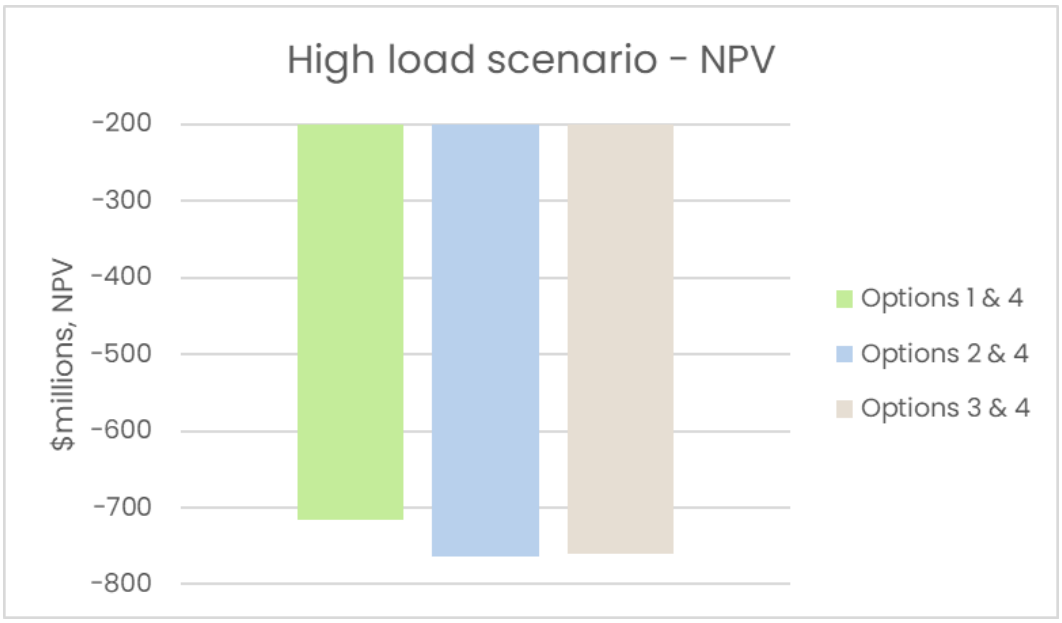
As with the central scenario, Options 2-3 require implementing both stages, whereas under the low demand scenario only Stage 1 is required for both options. Also:

- Stage 1 is undertaken two years earlier for both options than under the low demand scenario; and
- because of the demand increases are south of Cultana, both options must upgrade the transmission line between Cultana and Yadnarie (Stage 2) one year after the transformer is upgraded (Stage 1).

Furthermore, because of the high demand across all of the Eyre Peninsula, the connection to the rest of the network also needs to be upgraded. Option 4 must therefore be implemented under all options by 2030/31.

Figure 15 shows the NPV for the options and indicates Option 1 + Option 4 ranks above the other options. The respective NPVs are Option 1 + Option 4: -$716.29 m, Option 2 + Option 4: -$764.05 m and Option 3 + Option 4: -$760.42 m.

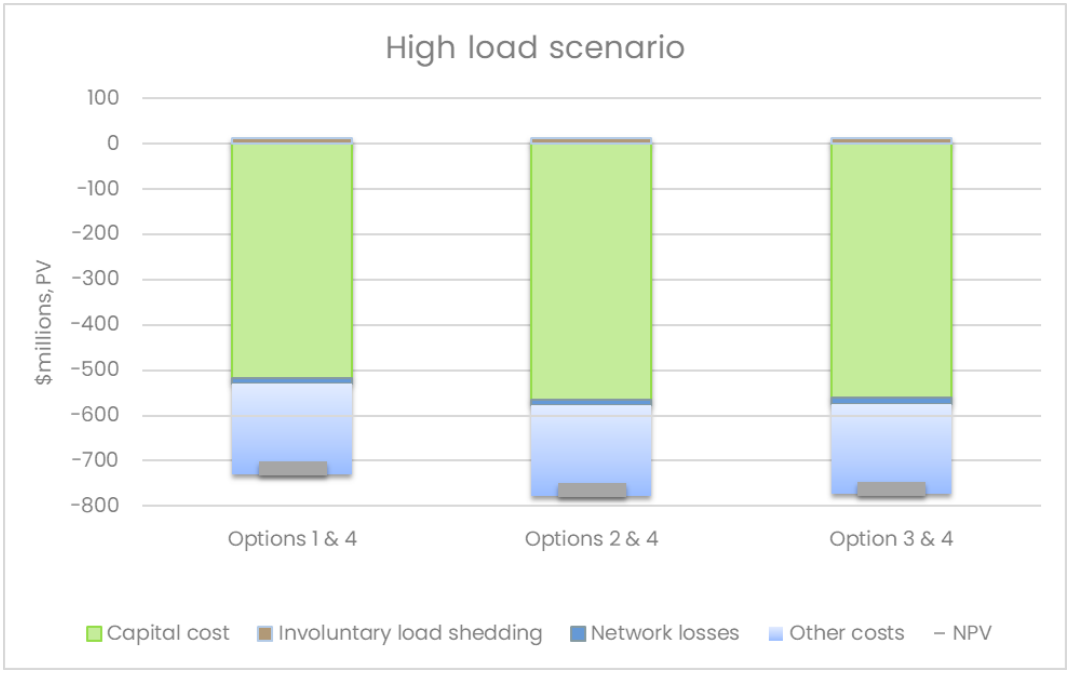
Figure 15. NPV for the high demand scenario



The inclusion of Option 4 as a component in all of the other options explains the large difference between the NPV for the low demand scenario and this high demand scenario.

Figure 16 presents a breakdown of costs and benefits under the high demand scenario calculated in present value terms.

Figure 16. Breakdown costs and benefits for the high load scenario

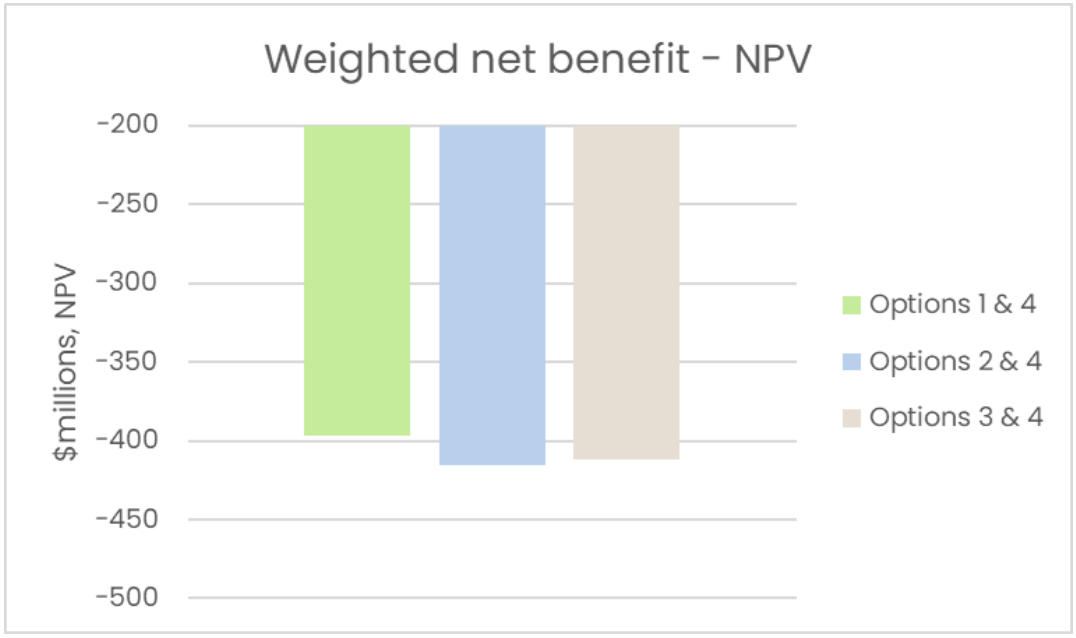


7.4 Weighted net benefits

Given the difficulty determining the most probable future demand scenario, ElectraNet has assigned each of the load scenarios an equal weight of a third to evaluate the overall weighted net market benefit.

Figure 17 shows the weighted results for the options, with Option 1 + Option 4 being the top-ranked. The respective NPVs are Option 1 + Option 4: -$397.08 m, Option 2 + Option 4: -$415.72 m and Option 3 + Option 4: -$412.04 m.

Figure 17. Weighted NPV outcome across demand scenarios



7.5 Sensitivity testing

ElectraNet has undertaken sensitivity testing to examine how the net market benefit of the credible options change with respect to changes in key modelling assumptions. The factors tested as part of the sensitivity analysis in this PACR are:

- Alternate commercial discount rate assumptions (4.18% to 10%)
- Higher and lower capital costs of the credible options (+50% to -30%); and
- Variations in the estimated VCR (+30% to -30%)

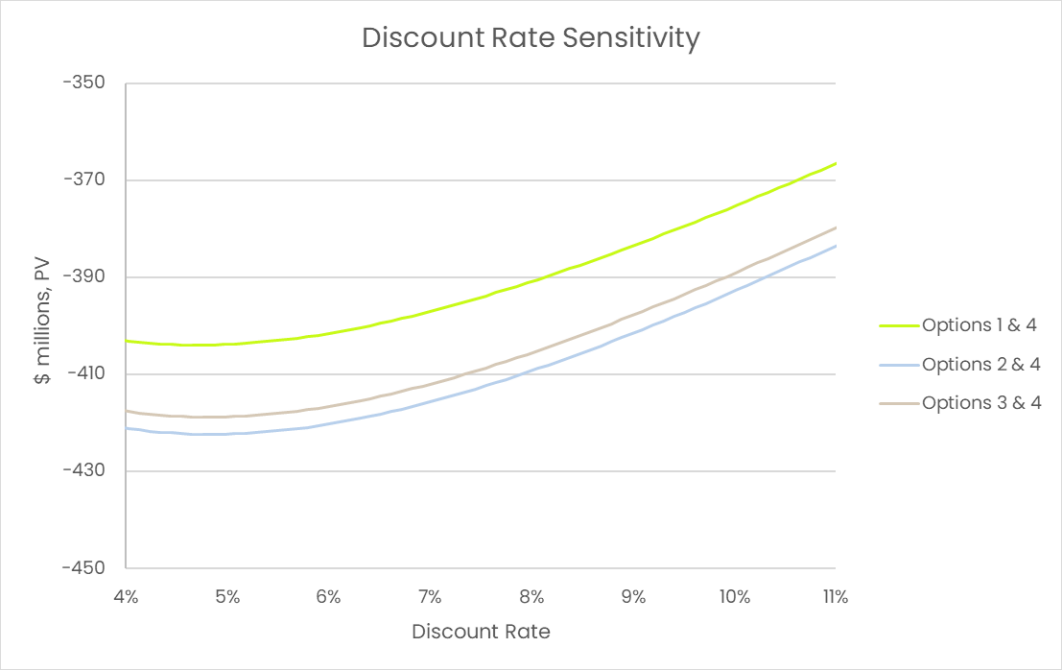
All sensitivity tests have been undertaken on the weighted results.

7.5.1 Sensitivity analysis on the discount rate

ElectraNet has examined possible variations on the discount rate and looked at a range between 4.18%[61] and 10%. Option 1 + Option 4 is the preferred option across the range.

In addition, we do not find a realistic 'boundary value' for Option 1 + Option 4 no longer being preferred. That is, there is no realistic alternate discount rate that would result in Option 2 + Option 4 or Option 3 + Option 4 being preferred over Option 1 + Option 4 on a weighted basis.

Figure 18. Sensitivity analysis - Discount Rate

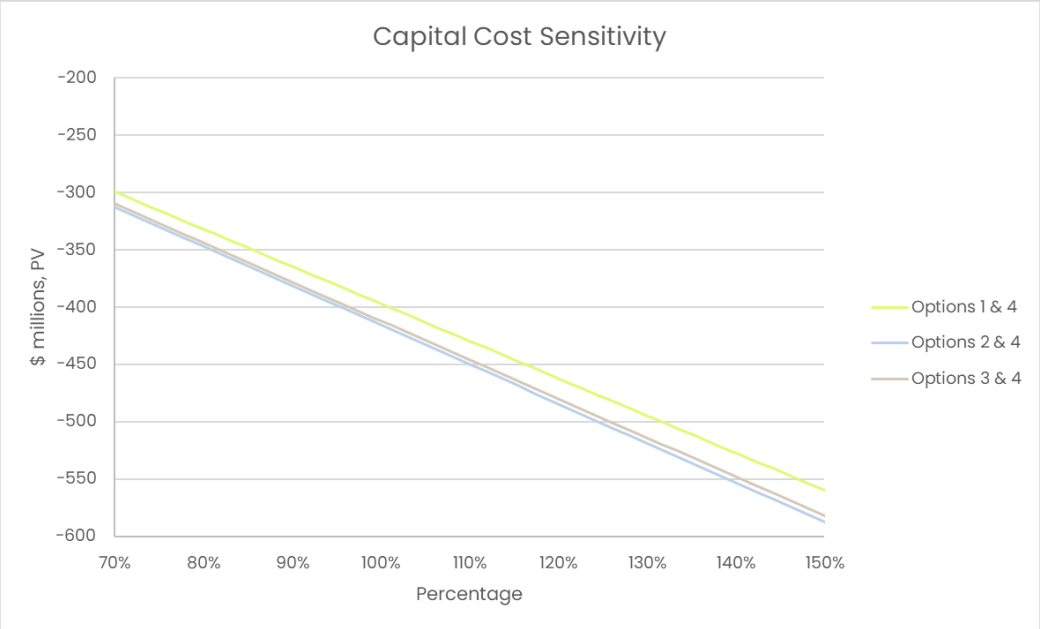


7.5.2 Sensitivity analysis on network capital costs

The costing for this report is considered 'class 4', which represents a range between +50% and -30%. Figure 19 shows how the net benefits behave in terms of changes in the assumed capital costs across this range and shows that Option 1 + Option 4 is the preferred option in all cases.

[61] This is equal to WACC (pre-tax, real) in the latest final decision for a transmission business in the NEM (Directlink) as of the date of this analysis, see: AER, April 2025, Directlink – 2025-30 – Final decision – PTRM. It has been updated from the 3.63% used in the PADR.

Figure 19. Sensitivity analysis - Capital costs



In addition, we do not find a realistic 'boundary value' for Option 1 + Option 4 no longer being preferred. That is, there is no realistic increase (or decrease) in assumed network capital costs that would result in Option 2 + Option 4 or Option 3 + Option 4 being preferred over Option 1 + Option 4 on a weighted basis.

7.5.3 Sensitivity analysis on VCR

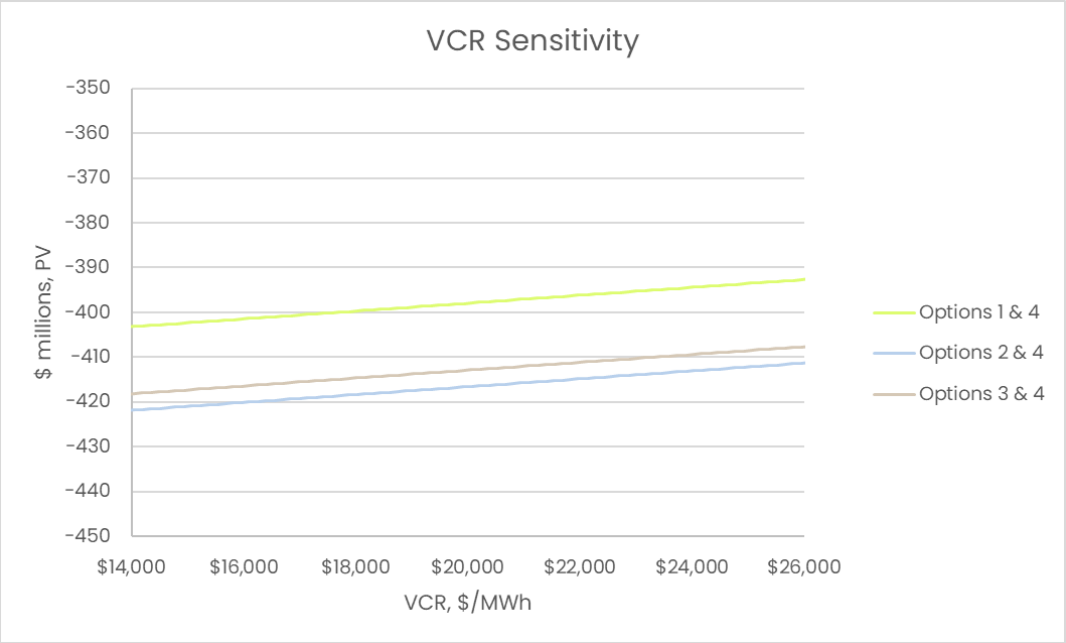
Because of the variety of customers in the Eyre Peninsula, ElectraNet has examined the sensitivity of the results to changes in the VCR in the range +30% to -30%, which is also consistent with the AER's stated level of confidence for their VCR estimates.[62]

Figure 20 shows Option 1 + Option 4 is the preferred option across the interval.

In addition, we do not find a realistic 'boundary value' for Option 1 + Option 4 no longer being preferred. That is, there is no realistic increase (or decrease) in the assumed VCR that would result in Option 2 + Option 4 or Option 3 + Option 4 being preferred over Option 1 + Option 4 on a weighted basis.

[62] AER, September 2020, Widespread and long duration outages – values of customer reliability - Final conclusions.

Figure 20. Sensitivity analysis - VCR



7.5.4 Sensitivity analysis on the assumed scenario weights

While the preferred option ranks behind the other two options under the low demand scenario (where Option 4 is not required), we have investigated what weight this scenario would need to be given, with the other two scenarios continued to be weighted equally, in order for Option 1 (plus Option 4) to no longer be preferred on a weighted basis.

This analysis finds that the low demand scenario would need to be given a weight of at least:

- 49% for Option 3 + Option 4 (the second ranked option) to have the same expected net benefits as Option 1 + Option 4; and
- 74% for Option 3 + Option 4 to have the expected net benefits that are at least 10% greater than Option 1 + Option 4.

We consider both weights as unreasonably high given the information we have through our close communication with load proponents as part of the formal connection process.

Moreover, the more granular classification of future large industrial load under AEMO's updated Electricity Demand Forecasting Methodology further supports the use of load forecasts in-line with our central and high demand scenarios.

8 Preferred option

The preferred option identified in this PACR is the combination of two of the options:

- **Option 1** - Develop the Yadnarie North substation now to enable upgrading of the transmission lines between Yadnarie and Cultana to 275 kV operation; and
- **Option 4** - Establish a new site close to Davenport and duplicate the 275 kV circuits supplying the Eyre Peninsula from Davenport, subject to commitment of a further around 400 MW of electrical load by 2031 on the Eyre Peninsula network, supplied out of Davenport.

The scope of Option 1 has been updated since the PADR following further planning analysis and updated information on LIL connection timing, and now also includes the implementation of an automated voltage control scheme for the Eyre Peninsula and surrounding areas, and upgrade of the Mullaquana connection point to 275 kV (as required).

The scope of Option 4 has also been updated based on new planning analysis and updated information. It now includes the reconfiguration of the 275 kV connections between Cultana and Cultana East.

The combination of Option 1 and Option 4 has the greatest net benefit, when weighted across three different demand scenarios, based on AEMO's 2024 ISP Step Change scenario. The analysis adopts a 20-year assessment period and draws on the central discount rate in AEMO's latest 2025 IASR.

While net benefits are negative, this is permitted under the RIT-T because the identified need is a reliability corrective action. Sensitivity analysis with respect to capital costs and other assumptions further support Option 1 + Option 4 as the preferred option.

The proposed preferred Option 1 component has a capital cost of approximately $186 million (including the complementary automated voltage control scheme), while the proposed preferred Option 4 component has a capital cost of approximately $642 million (including the reconfiguration works at Cultana/Cultana East).

In addition, the complementary Mullaquana connection point upgrade is estimated to involve $80 million, if required, and this would be a prescribed asset forming part of the shared network. ElectraNet would apply to the AER for recovery of these costs via a Contingent Project Application once there is sufficient certainty relating to the LILs connecting at Mullaquana.

The key re-opening trigger for this RIT-T is the load required to justify establishing a new site close to Davenport and duplicating the Davenport to Cultana 275 kV circuits (i.e. the Option 4 components) not eventuating. Specifically, based on the assessment included in this PACR, we consider that the following is a re-opening trigger under this RIT-T:

- No central (Step Change) demand forecast published by AEMO before 1 January 2031, with a total load forecast (existing plus committed) for the Eyre Peninsula above 570 MW.[63]

[63] This corresponds to the N-1 thermal capacity of the double circuit 275 kV Davenport-Cultana transmission line assuming a 0.95 power factor.

Based on the sensitivity assessment included in this PACR, we do not consider there to be any other relevant re-opening triggers for this RIT-T. Specifically, the finding that Option 1 (plus Option 4) is the preferred option is found to be robust to all key assumptions (e.g. assumed capital costs, discounts rates, etc). No submissions on re-opening triggers were received following publication of the proposed triggers in the PADR.

Should outturn demand not be sufficient to justify the Option 4 components, ElectraNet would provide a letter to the AER outlining how, as a consequence, the preferred option for this RIT-T would change and that this component would no longer be required. Given that this component of the preferred option is separable, a decision not to proceed with Option 4 would have no implications for the Option 1 components, and ElectraNet does not consider that a new RIT-T would therefore be required.

Appendix A Compliance Tables

This appendix sets out a checklist which demonstrates the compliance of this PACR with the requirements of the NER version 240.

Table 12: Compliance checklist of PACR with NER

Rules clause	Summary of requirements	Relevant section(s) in the PACR
5.16.4(v)	**The PACR must set out:**	–
	(1) the matters detailed in the project assessment draft report as required under paragraph (k); and	See below.
	(2) a summary of, and the RIT-T proponent's response to, submissions received, if any, from interested parties sought under paragraph (q).	N/A
5.16.4(k)	**A RIT-T proponent must prepare a PADR, which must include:**	–
	(1) a description of each credible option assessed;	Chapter 4
	(2) a summary of, and commentary on, the submissions to the project specification consultation report (PSCR) and the PADR;	Appendix E
	(3) a quantification of the costs, including a breakdown of operating and capital expenditure, and classes of material market benefit for each credible option;	Chapter 5 and 6
	(4) a detailed description of the methodologies used in quantifying each class of material market benefit and cost;	Chapter 5
	5) reasons why the RIT-T proponent has determined that a class or classes of market benefit are not material;	Section 5.1
	6) the identification of any class of market benefit estimated to arise outside the region of the Transmission Network Service Provider affected by the RIT-T project, and quantification of the value of such market benefits (in aggregate across all regions);	N/A
	(7) the results of a net present value analysis of each credible option and accompanying explanatory statements regarding the results;	Chapter 7
	(8) the identification of the proposed preferred option;	Chapter 8
	(9) for the proposed preferred option identified under subparagraph (8), the RIT-T proponent must provide: (a) details of the technical characteristics; (b) the estimated construction timetable and commissioning date; (c) if the proposed preferred option is likely to have a material inter-network impact and if the Transmission Network Service Provider affected by the RIT-T project has received an augmentation technical report, that report; and (d) a statement and the accompanying detailed analysis that the preferred option satisfies the regulatory investment test for transmission.	Chapter 8 sections 4.1 and 4.4
	(10) the RIT reopening triggers applying to the RIT-T project.	Chapter 8

Rules clause	Summary of requirements	Relevant section(s) in the PACR
5.16.4(l)	If a Network Service Provider affected by a RIT-T project elects to proceed with a project which is for reliability corrective action, it can only do so where the proposed preferred option has a proponent. The RIT-T proponent must identity that proponent in the project assessment draft report.	ElectraNet is the proponent for the preferred option.

In addition, the table below outlines a separate compliance checklist demonstrating compliance with the binding guidance in the latest AER RIT-T guidelines.

Table 13: Compliance checklist of PACR with AER RIT-T Guidelines

Guidelines section	Summary of the requirements	Section in the PACR
3.2.5	A RIT-T proponent must consider social licence issues in the identification of credible options. A RIT proponent should include information in its RIT reports about when and how social licence considerations have affected the identification and selection of credible options.	N/A[64]
3.4.3	The value of emissions reduction (VER), reported in dollars per tonne of emissions (CO2 equivalent), is used to value emissions within a state of the world. A RIT-T proponent is required to use the then prevailing VER under relevant legislation or, otherwise, in any administrative guidance.	N/A[65]
3.5A.1	Where the estimated capital costs of the preferred option exceed $103 million (as varied in accordance with a cost threshold determination), a RIT-T proponent must, in a RIT-T application: outline the process it has applied, or intends to apply, to ensure that the estimated costs are accurate to the extent practicable having regard to the purpose of that stage of the RIT-T for all credible options (including the preferred option), either apply the cost estimate classification system published by the AACE, or if it does not apply the AACE cost estimate classification system, identify the alternative cost estimation system or cost estimation arrangements it intends to apply, and provide reasons to explain why applying that alternative system or arrangements is more appropriate or suitable than applying the AACE cost estimate classification system in producing an accurate cost estimate	Sections 6.3 and 6.4

[64] These are new requirements stipulated in revised RIT-T Application Guidelines released by the AER, which came into effect on 21 November 2024. For compliance purposes, the AER only have regard to the guidance that was in effect when ElectraNet initiated the RIT-T in question. In this context, initiated means from the publication of a PSCR. As the PSCR was published prior to 21 November 2024, these new requirements are not applicable to this RIT-T.

[65] Please see the footnote above regarding this being a new requirement in the latest AER RIT-T Application Guidelines and not being relevant to this PACR.

Guidelines section	Summary of the requirements	Section in the PACR
3.5A.2	For each credible option, a RIT-T proponent must specify, to the extent practicable and in a manner which is fit for purpose for that stage of the RIT-T: all key inputs and assumptions adopted in deriving the cost estimate a breakdown of the main components of the cost estimate the methodologies and processes applied in deriving the cost estimate (e.g. market testing, unit costs from recent projects, and engineering-based cost estimates) the reasons in support of the key inputs and assumptions adopted and methodologies and processes applied the level of any contingency allowance that have been included in the cost estimate, and the reasons for that level of contingency allowance	Sections 6.3 and 6.4
3.5	In the RIT-T, costs must include the following classes: Costs incurred in constructing or providing the credible option Operating and maintenance costs over the credible option's operating life Costs of complying with relevant laws, regulations and administrative requirements For, asset replacement projects or programs, there are costs resulting from removing and disposing of existing assets, which a RIT-T assessment should recognise. RIT-T proponents should include these costs in the costs of all credible options that require removing and disposing of retired assets. For completeness, the RIT-T proponent would exclude these costs from the 'BAU' base case.	Sections 6.3 and 6.4
3.5.3	The RIT-T proponent is required to provide the basis for any social licence costs in its RIT-T reports and may choose to refer to best practice from a reputable, independent and verifiable source.	N/A[66]
3.6	RIT-T proponents are required to apply classes of market benefits consistently across all credible options.	Chapter 5
3.7.3	When calculating the benefit from changes in Australia's greenhouse gas emissions, a RIT-T proponent is required to: include the following emissions scopes, unless the change relative to the base case can be demonstrated to be immaterial to the RIT outcome: direct emissions from generation direct emissions other than from generation estimate the change in annual emissions (once identified in accordance with this Guideline) between the base case and the credible option, and multiplying this change by the annual VER to arrive at the annual benefit from changes in Australia's greenhouse gas emissions	N/A
3.8.2	Where the estimated capital cost of the preferred option exceeds $100 million (as varied in accordance with an applicable cost threshold determination), a	Section 7.5

[66] Please see footnote on the previous page regarding these being new requirements in the latest AER RIT-T Application Guidelines and not being relevant to this PACR.

Guidelines section	Summary of the requirements	Section in the PACR
	RIT-T proponent must undertake sensitivity analysis on all credible options, by varying one or more inputs and/or assumptions.	
3.9.4	If a contingency allowance is included in a cost estimate for a credible option, the RIT-T proponent must explain: the reasons and basis for the contingency allowance, including the particular costs that the contingency allowance may relate to, and how the level or quantum of the contingency allowance was determined.	N/A
3.11.2	Where a concessional finance agreement is included, the RIT-T proponent is required to provide sufficient detail about the concessional finance agreement to justify an agreement's inclusion and such that it can articulate how the value of the concession is to or would be shared with consumers. If a proponent seeks to include an unexecuted concessional finance agreement in the RIT-T, they must undertake sensitivity testing for the scenario the agreement doesn't eventuate.	N/A[67]
4.1	RIT-T proponents are required to describe in each RIT-T report how they have engaged with local landowners, local council, local community members, local environmental groups or traditional owners and sought to address any relevant concerns identified through this engagement how they plan to engage with these stakeholder groups, or why this project does not require community engagement.	N/A[67]

[67] Please see footnote on a previous page regarding these being new requirements in the latest AER RIT-T Application Guidelines and not being relevant to this PACR.

Appendix B Definitions

All laws, regulations, orders, licences, codes, determinations and other regulatory instruments (other than the Rules) which apply to Registered Participants from time to time, including those applicable in each participating jurisdiction as listed below, to the extent that they regulate or contain terms and conditions relating to access to a network, connection to a network, the provision of network services, network service price or augmentation of a network.

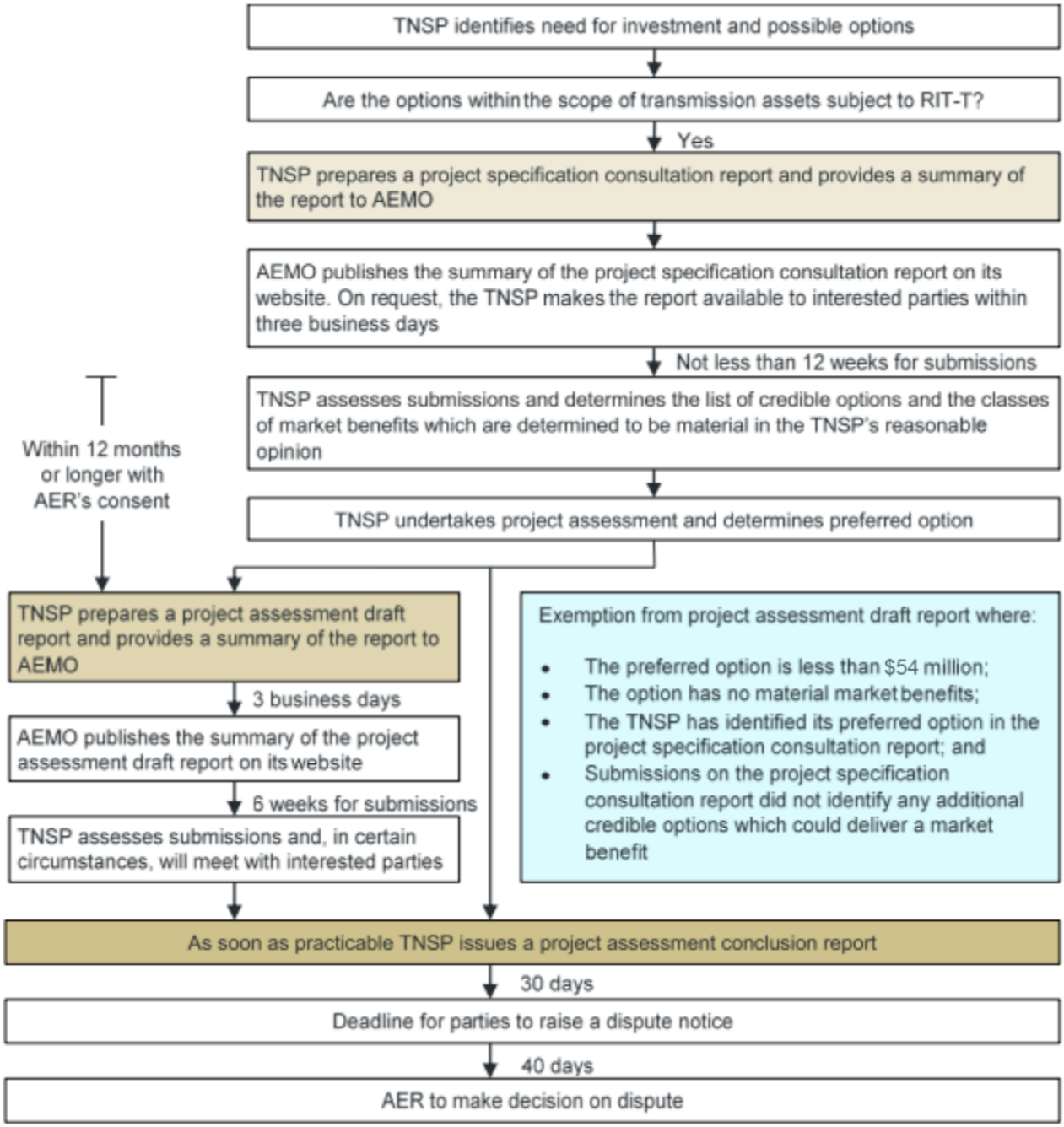
A comprehensive list of applicable regulatory instruments is provided in the Rules.

Applicable regulatory instruments	
AEMO	Australian Energy Market Operator
Base case	A situation in which no option is implemented by, or on behalf of the transmission network service provider.
Commercially feasible	An option is commercially feasible if a reasonable and objective operator, acting rationally in accordance with the requirements of the RIT-T, would be prepared to develop or provide the option in isolation of any substitute options. This is taken to be synonymous with 'economically feasible'.
Costs	Costs are the present value of the direct costs of a credible option
Credible option	A credible option is an option (or group of options) that: address the identified need; is (or are) commercially and technically feasible; and can be implemented in sufficient time to meet the identified need.
Economically feasible	An option is likely to be economically feasible where its estimated costs are comparable to other credible options which address the identified need. One important exception to this Rules guidance applies where it is expected that a credible option or options are likely to deliver materially higher market benefits. In these circumstances the option may be "economically feasible" despite the higher expected cost. This is taken to be synonymous with 'commercially feasible'

Applicable regulatory instruments	
Identified need	The reason why the Transmission Network Service Provider proposes that a particular investment be undertaken in respect of its transmission network.
Market benefit	Market benefit must be: the present value of the benefits of a credible option calculated by: a) comparing, for each relevant reasonable scenario: i. the state of the world with the credible option in place to ii. the state of the world in the base case, And b) weighting the benefits derived in sub-paragraph (i) by the probability of each relevant reasonable scenario occurring. a benefit to those who consume, produce and transport electricity in the market, that is, the change in producer plus consumer surplus.
Net market benefit	Net market benefit equals the market benefit less costs.
Preferred option	The preferred option is the credible option that maximises the net economic benefit to all those who produce, consume and transport electricity in the market compared to all other credible options. Where the identified need is for reliability corrective action, a preferred option may have a negative net economic benefit (that is, a net economic cost).
Reasonable Scenario	Reasonable scenario means a set of variables or parameters that are not expected to change across each of the credible options or the base case.

Appendix C Process for implementing the RIT-T

For the purposes of applying the RIT-T, the NER establish a typically three stage process, ie: (1) the PSCR; (2) the PADR; and (3) the PACR. This process is summarised in the figure below (in gold).



Appendix D AEMO categories for prospective large industrial load projects

AEMO's 2025 Electricity Demand Forecasting Methodology document[68], defines three categories for future large industrial loads: committed, anticipated and proposed. The status of the project will depend on:

- Current stage of the connection process (pre-feasibility, enquiry, application, contracts, construction and completion)
- Environment and planning approvals
- Financial and contract information
- Other information from load surveys, TNSP insights or others that provide information on the likelihood of the development progressing.

ElectraNet believes the TNSP knowledge of the potential customer and its approach to the connection process can provide valuable information to help establish the project status.

Committed projects are those with a very high likelihood of being developed, based on a combination of information such as:

- The project is being commissioned or is under construction.
- The project has reached final investment decision and made public.
- The project is at least at the application stage (including final investment decision) in the connection process.
- Other information indicating the project has a very high likelihood of being developed. Information could come from AEMO's LIL survey process, TNSP information requests or similar.

Anticipated projects have a high likelihood of being developed, based on a combination of information such as:

- The project environmental and planning approvals are progressing.
- The project is at least at enquiry or a later stage in the connection process.
- Other information indicating the project has a high likelihood of being developed. Information could come from AEMO's LIL survey process, TNSP information requests or similar.

Proposed projects are other projects not classified by AEMO as committed or anticipated, identified explicitly based on the following information:

- The project is at pre-feasibility or a later stage in the connection process or
- The project has not reached pre-feasibility stage but is assessed as likely because:
    - aligns with government policy, or
    - is of state significance, or
    - is assessed as likely based on
- AEMO's LIL survey process, TNSP information requests, market research or similar.

[68] AEMO, 2025 Forecasting Approach - Electricity Demand Forecasting Methodology

Additionally, TNSPs can assess the probabilities of success/completion for projects and provide these to AEMO with any other relevant information. AEMO will then assess this and other information to determine the possible inclusion of the load in the forecast on a probability weighted basis (derating the load by its assessed probability, in energy and demand terms).

The methodology indicates that for the short-term (up to and including the reliability obligation threshold) only committed projects should be used for the central scenario and committed plus anticipated projects for higher economic growth scenario. For the medium and long-term (beyond the reliability obligation threshold) the committed, anticipated and some proposed projects should be used for the central scenario and all the proposed projects should be added for high economic growth.

If supported by additional information AEMO might apply delays and/or reduction to the expected annual consumption and rated demand of prospective projects.

AEMO indicates that anticipated projects could be considered in the Step Change scenario only if they are proposed for beyond the “reliability obligation threshold”. ElectraNet is of the opinion that this period underestimates the speed at which industry could act and establish a large industrial load.

Appendix E Submissions to the PSCR

As outlined in section 3 of the PADR, ElectraNet received three submissions to the PSCR, one representing a South Australian government's development agency, one an equipment distributor and another a non-identifiable industrial project developer. The non-confidential points raised in these submissions are summarised below.

Port Bonython Hydrogen Hub project - South Australian government – former Office of Hydrogen Power

The Government of South Australia facilitates collaboration with private sector developers as part of the Port Bonython Hydrogen Hub (PBHH) project, and in July 2024 the former Office of Hydrogen Power presented a submission on behalf of the Port Bonython Hydrogen Hub, Power and Transmission Precinct Working group.

The submission provided information relating to the expected capacity of the aggregated PBHH new loads. The information reflects that projects are anticipated to be developed in stages:

- Initial project stages have the ambition to produce and export green hydrogen by 2030 with a forecast load of up to 750 MW.
- Subsequent stages involve the scale up of green hydrogen production capacity in the mid-2030 with total forecast load increasing to up to about 1650 MW.

It is expected that any developments at Port Bonython will connect to Cultana 275 kV.

This information has been used to incorporate the two stages of this project in the high scenario forecast, as a proposed project.

Xatech International – commercial representative

Xatech International is the representative for Epsilon Composite Cables. Epsilon offers a low-sag/high-temperature conductor, the HVCRC© composite core conductor which can be used to reconductor existing transmission lines or for new transmission lines.

The main advantage is the increase in the transmission line's thermal limit, when compared to equivalent size traditional conductors. For new transmission lines, because the lighter weight of the composite conductors, there will be a small reduction of required towers or the line's design could be modified to reduce the right of way.

The submission presents the possibility of using HVCRC© conductor as alternative to traditional conductors for:

- Option 4 from the PSCR – Duplicate Davenport to Cultana 275 kV. Use composite conductor for the proposed new 275 kV double-circuit transmission line, allowing for a larger thermal rating.
- Option 5 from the PSCR – Duplicate Cultana to Yadnarie 275 kV.
    - Alternative 1. Use composite conductor for the proposed new 275 kV double-circuit transmission line. Allows for a larger thermal rating.
    - Alternative 2. Reconductor the existing 275 kV double-circuit transmission line with a composite conductor. Reduce the required investment and it will allow for a thermal rating comparable to the parallel of the two double-circuit lines proposed.

- Additional option – Upgrade Yadnarie to Port Lincoln 132 kV.[69] Xatech includes this option as a possible solution to consider when the capacity increase could be required. Upgrade the existing 132 kV double-circuit transmission line by reconductoring the line with a composite conductor. As alternative 2 above, it will reduce the required investment to upgrade, and it will allow for a thermal rating comparable to twice of the existing double-circuit line.
- The possibility of using this type of conductor is not considered in this report as this is part of the conductor selection process, which will look to optimise the conductor during the design phase of any new transmission lines and follows the RIT-T process[70].

Confidential industrial project developer

The developer has requested confidentiality on its submission.

Based on their analysis and studies the developer supports Option 1 – Upgrade the Cultana to Yadnarie section to 275 kV. This option aligns with its strategic vision of converting Yadnarie into a renewable energy and long-duration storage hub on the Eyre Peninsula.

[69] The PSCR did not include any option to increase capacity on the 132 kV double-circuit transmission line between Yadnarie and Port Lincoln. With the information available to ElectraNet at October 2024, we do not see the need to increase this transmission line capacity.

[70] Xatech has not provide any cost for their Epsilon Composite Cable, however AEMO's costing tool shows a composite conductor might be competitive in terms of construction cost.

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