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South Australia's electricity transmission specialist

Eyre Peninsula electricity supply options investigation

Adelaide Public Forum

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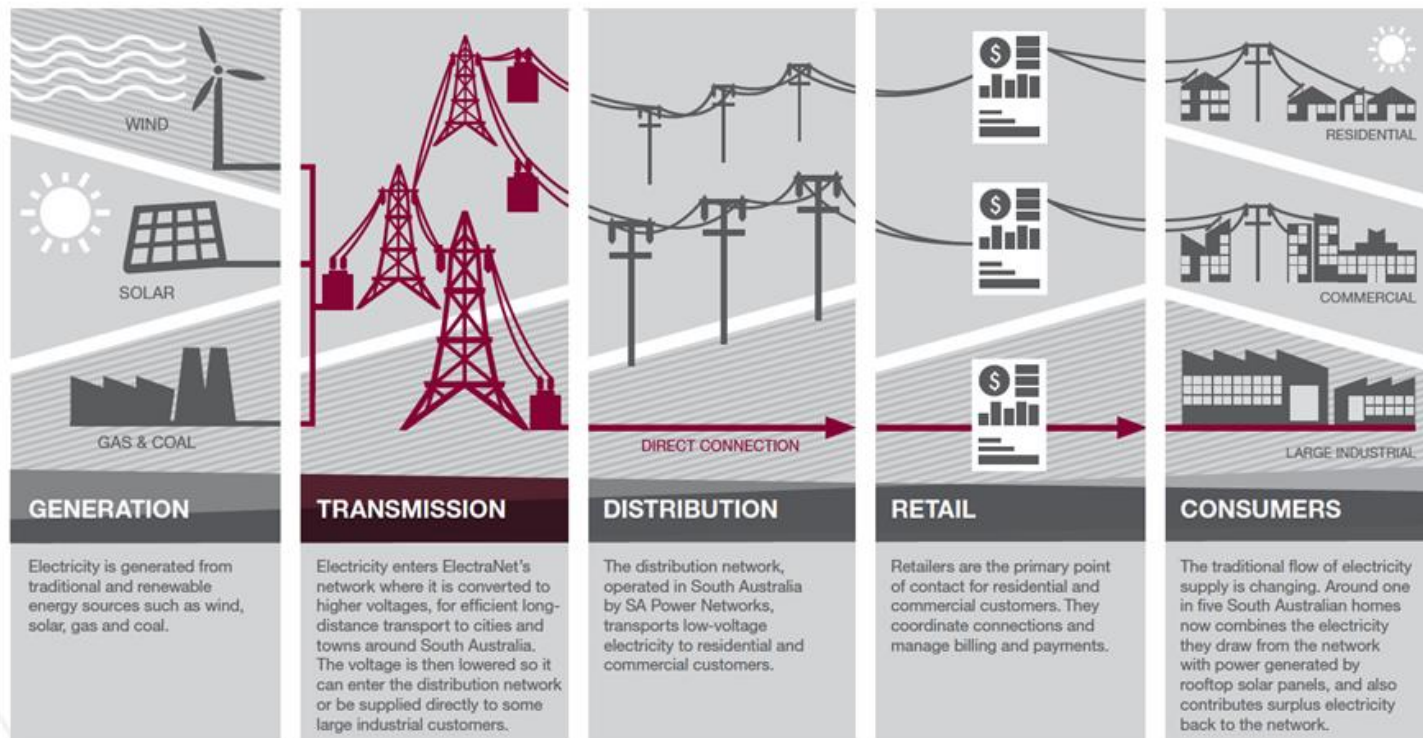
Purpose and outline

- > Provide context and explain what ElectraNet is doing to support energy transformation in South Australia
- > Explain the regulatory framework for transmission network investments
- > Describe what ElectraNet is doing to investigate electricity supply options for Eyre Peninsula
- > Provide the opportunity to clarify understanding and hear the views of customers and stakeholders as input to the next phase of ElectraNet's investigation

About ElectraNet

- > Owner and operator of SA's regulated transmission network
- > Making connections and moving high-voltage power over long distances

How electricity gets to you



Consumer Advisory Panel

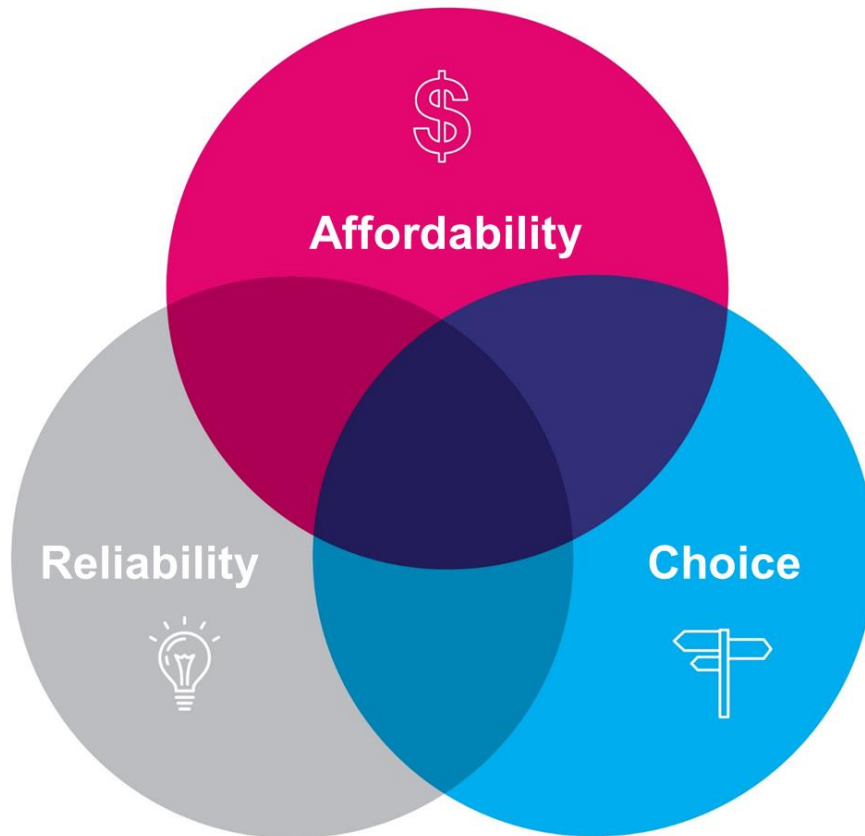
ElectraNet actively engages with customer representatives and stakeholders



Energy Consumers Coalition of South Australia

For more information see www.electranet.com.au

What we understand customers want



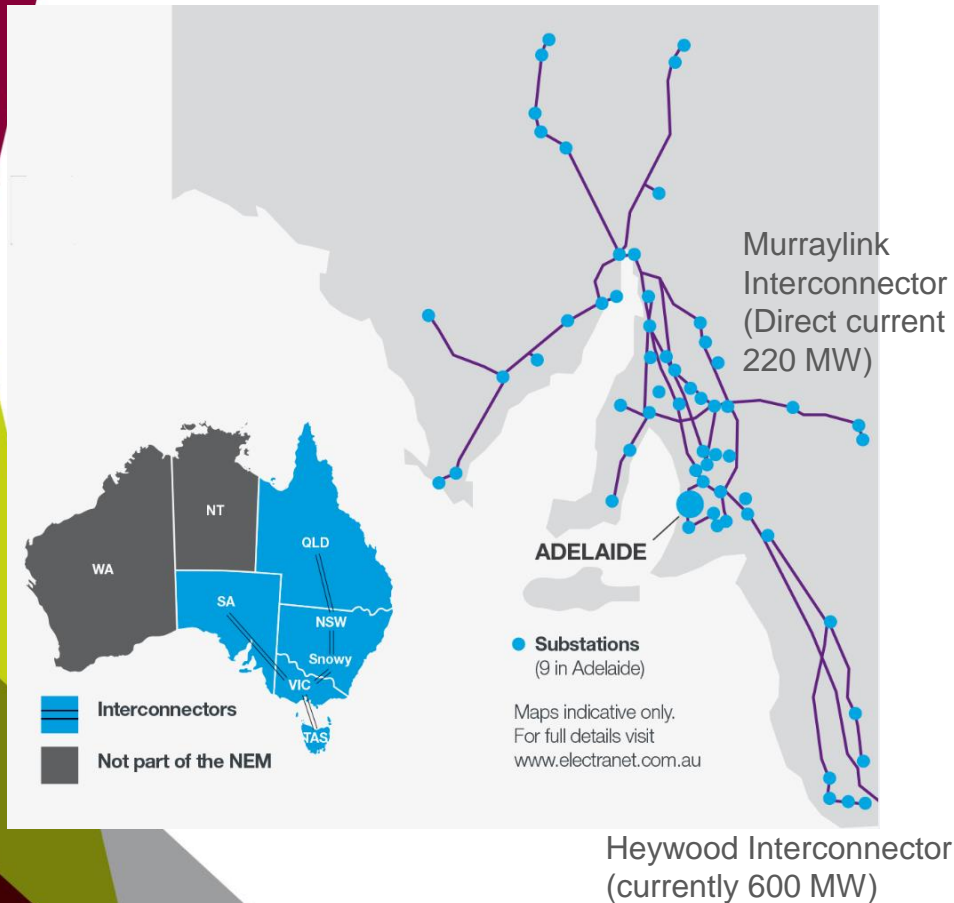
This has shaped our vision for the South Australian transmission network which is:

“To deliver affordable and reliable power supplies that support customer choice and a sustainable future”

For more information see www.electranet.com.au

South Australian context

South Australia (SA) is at the forefront of energy transformation



- > Leading integration of intermittent renewable energy with abundant high quality resources
- > Closure of coal fired power stations
- > Reliance on gas generation and impact of higher gas prices
- > Higher wholesale electricity market and futures prices in SA
- > Recent SA separation and load shedding events are leading to heightened concerns about power system security
- > SA Government and AEMO have introduced new measures to manage power system security
- > Finkel review recommendations
- > Ongoing policy drivers to lower carbon emissions, new technology and customer choice are driving energy transformation

NEM – National Electricity Market
 AEMO – Australian Energy Market Operator

ElectraNet initiatives

ElectraNet is playing a leading role to deliver affordability, reliability and choice for customers

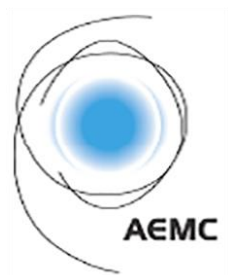


- > South Australian Energy Transformation RIT-T, investigating the feasibility of new interconnector options and non-network alternatives to put downward pressure on price and improve system security
- > **Eyre Peninsula electricity supply options**
- > Proof of concept battery storage project to demonstrate the role of battery storage in integrating renewable energy
- > Synchronous condensers to meet system strength requirements
- > Special protection scheme to ensure successful islanded operation of SA power system when needed

RIT-T – Regulatory Investment Test for Transmission

Applicable regulation

National



Makes the Rules that govern the market



Operates power system and National Electricity Market



Regulates energy markets and networks under legislation

State



ESCOSA is responsible for the Electricity Transmission Code and transmission reliability standards



Government of South Australia

Office of the Technical Regulator
- Safety and technical compliance

ESCOSA Inquiry

- > ESCOSA is examining prudent and efficient options for improving the reliability and quality of electricity supply on the Eyre Peninsula
- > Inquiry was referred to ESCOSA by the Treasurer on 9 March 2017
- > ESCOSA is consulting directly with stakeholders and will conduct public consultation on its draft report in June/ July 2017
- > Final report to be submitted to the Treasurer by 6 October 2017

For more information see www.escosa.sa.gov.au

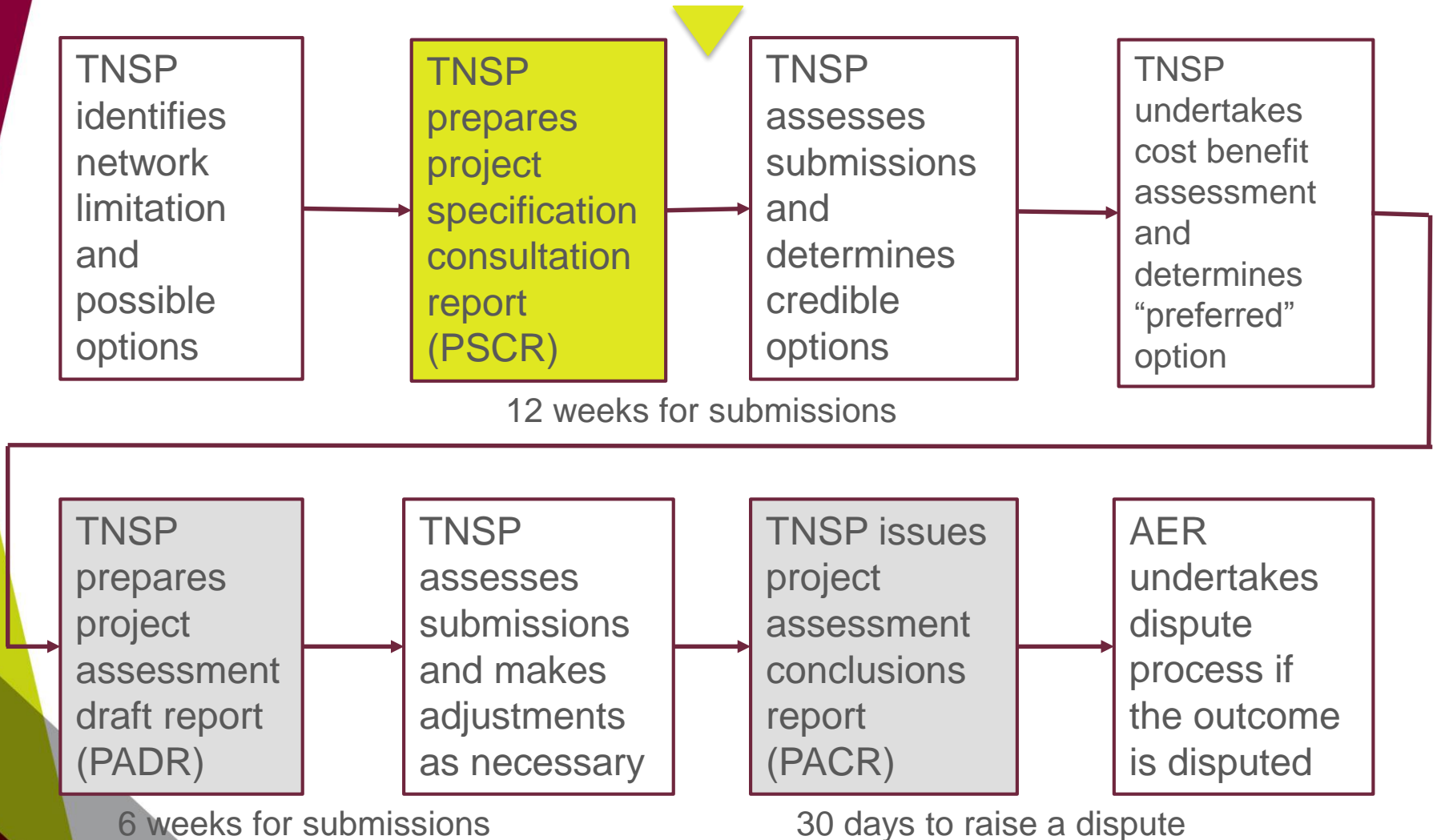
Regulatory Investment Test

- > The Regulatory Investment Test for Transmission (RIT-T)...
 - Is an economic cost benefit test designed to ensure that network investment or non-network alternatives deliver net benefits to customers
 - Must be applied to transmission network investments more than \$6m
 - Considers all technically and economically feasible options to meeting an identified need (such as a network limitation or constraint)
 - Both network and non-network solution options are considered
 - Involves an open and transparent public consultation process

For more information see www.aer.gov.au

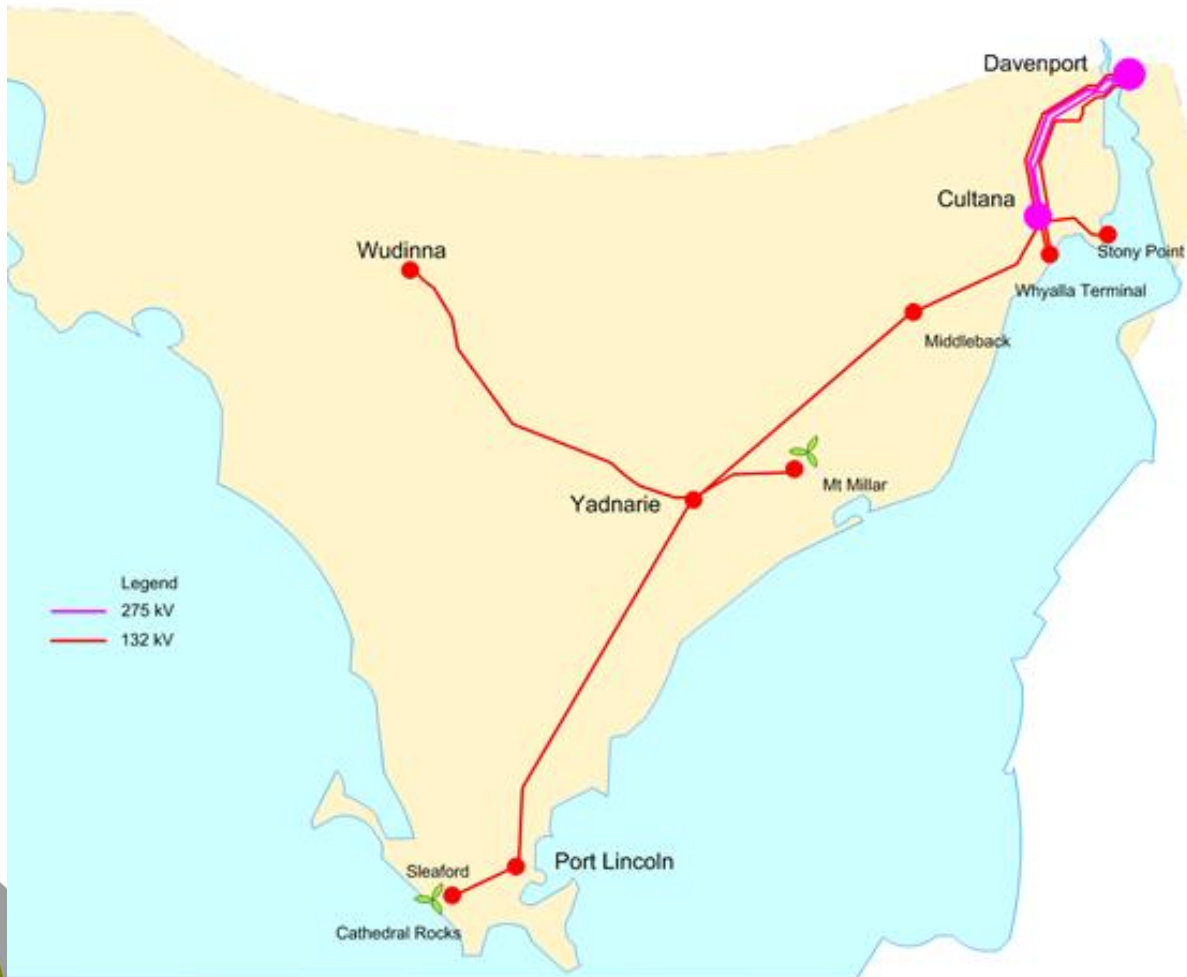
RIT-T process

We are here (PSCR published 28 April 2017)



TNSP = Transmission Network Service Provider

Eyre Peninsula transmission network



- > Existing 132kV radial line is close to full capacity with limited potential to meet increased demand
- > Asset condition challenges with line >45 years old
- > Port Lincoln supply reliability includes network support from 3 x 25 MW diesel-fired gas turbines

Current maximum demand is about 55 MW southwest of Cultana with about 35 MW at Port Lincoln

Background to exploring options

New drivers now exist for looking at Eyre Peninsula electricity supply options

ElectraNet commenced feasibility studies in 2011

Formal economic (RIT-T) assessment

- Draft economic assessment report – Jan 2013
- Found a new higher capacity 275 kV transmission line is economic to meet a demand increase of about 50 MW or more
- Process put on hold pending customer commitment

New drivers now exist for reassessing options

- Condition of existing transmission line
- Expiry of Port Lincoln network support agreement

For more information see www.electranet.com.au

Eyre Peninsula reliability standards

Electricity Transmission Code¹ specifies minimum reliability standards

Exit point	Description ²
Middleback (Category 1)	<ul style="list-style-type: none"> • Provide “N” equivalent line and transformer capacity for 100% of contracted demand (i.e. with all transmission elements in service)
Wudinna and Yadnarie (Category 2)	<ul style="list-style-type: none"> • Provide “N” equivalent line capacity for 100% of contracted demand (i.e. with all transmission elements in service) • Provide “N-1” equivalent transformer capacity for 100% of contracted demand (i.e. with any one element out of service)
Port Lincoln (Category 3)	<ul style="list-style-type: none"> • Provide “N-1” equivalent line and transformer capacity for 100% of contracted demand (i.e. with any one element out of service), including the use of post-contingent network support operation

¹ TC09 July 2018

² Restoration standards also apply in each case

For more information see www.escosa.sa.gov.au

Identified need for RIT-T

To explore electricity supply options for meeting reliability standards at Port Lincoln most efficiently in the future

Identified need is driven by:

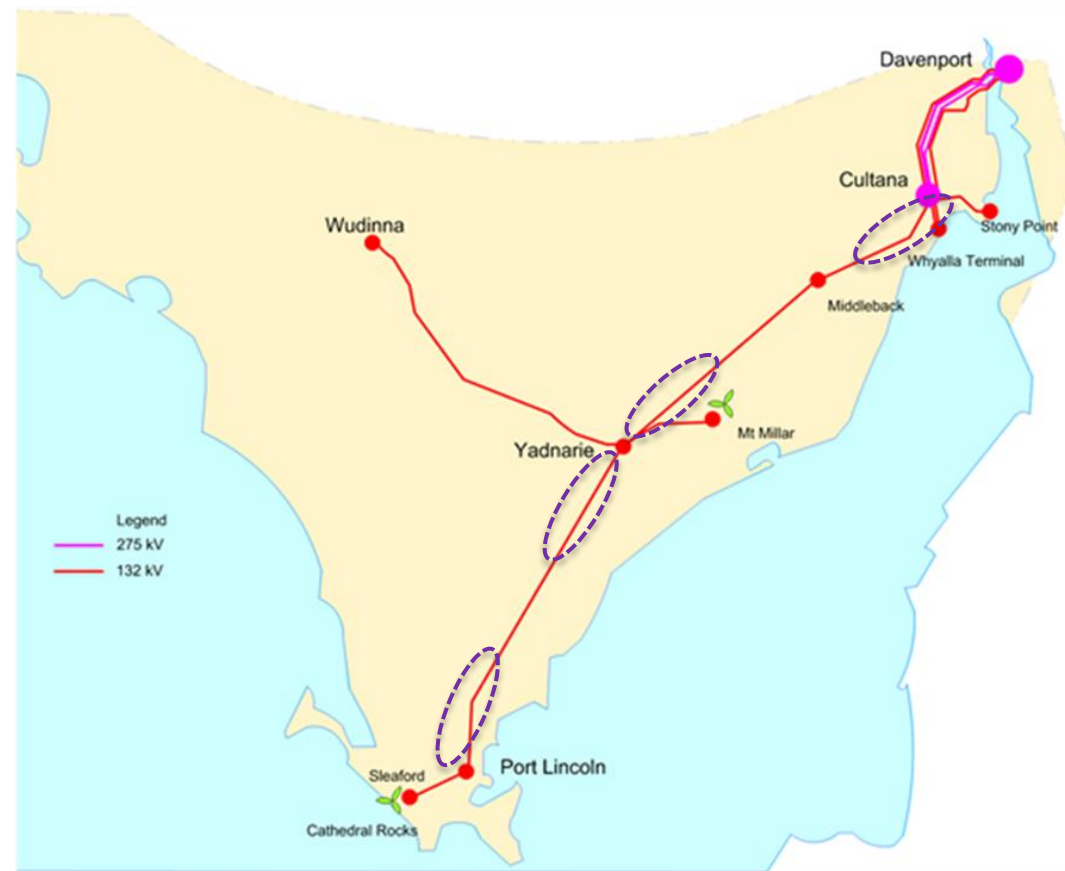
- > The need to **replace significant transmission line components** in the next few years
- > The upcoming **expiry of the network support arrangement** at Port Lincoln


Electricity supply to Eyre Peninsula

Primary options:

- > Partial line replacement (to replace components at end of life)
- > Full rebuild of the transmission line supplying the Eyre Peninsula

Full line replacement would proceed only if benefits to customers exceed costs



 About 120 km of line conductor needs to be replaced in next 5-year regulatory period

Options identified in PSCR

Option	Overview of option	Cost (\$ million)
1	Replace components of the existing 132 kV single-circuit transmission line and enter a new network support contract	80, plus network support costs
2	Construct a new double-circuit 132 kV transmission line following a Cultana to Yadnarie to Port Lincoln route	200-300
3	Construct two new single-circuit 132 kV transmission lines following separated routes between Cultana and Port Lincoln	200-350
4	Construct a new double-circuit 275 kV transmission line following a Cultana to Yadnarie to Port Lincoln route	280-380
5	Construct two now single-circuit 275 kV transmission lines following separated routes between Cultana and Port Lincoln	400-550

Non-network options

The PSCR sets out indicative technical and commercial requirements of non-network options

- > Each of the options currently proposed will require network support, either as an ongoing requirement or until the new 132 kV or 275 kV lines are constructed:
 - Option 1: 10 years or more
 - Options 2-5: 2-5 years
- > For options that rely on double circuit lines, we will also investigate:
 - The costs and benefits of an emergency back-up arrangement
 - To quickly install and activate back-up generators in the unlikely event of an extended unavailability of both circuits

Benefits to be quantified

Identification of a preferred option will depend on the impact each option has across a wide range of potential benefits

> Benefits include:

- Reductions in unserved energy on the Eyre Peninsula
- Flexibility to support future new demand and generation on the Eyre Peninsula (“option value”)
- Customer benefits of reducing constraints on existing wind farms
- Reducing transmission system electrical losses

Current status and next steps

ElectraNet is committed to running an open and transparent process to find the best option for affordable and reliable electricity supply

Milestone	Timing
Project Specification Consultation Report (PSCR) published	28 April 2017
Public forums	26 and 29 June 2017
Submissions on PSCR close	21 July 2017
Draft report (PADR) consultation and public forum	Q4 2017
Final report (PACR)	Q1 2018