Eyre Peninsula electricity supply options investigation

Adelaide Public Forum

Rainer Korte
Executive Manager Asset Management

Security Classification: Public
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

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>TRANSMISSION</th>
<th>DISTRIBUTION</th>
<th>RETAIL</th>
<th>CONSUMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity is generated from traditional and renewable energy sources such as wind, solar, gas and coal.</td>
<td>Electricity enters ElectraNet’s network where it is converted to higher voltages, for efficient long-distance transport to cities and towns around South Australia. The voltage is then lowered so it can enter the distribution network or be supplied directly to some large industrial customers.</td>
<td>The distribution network, operated in South Australia by SA Power Networks, transports low-voltage electricity to residential and commercial customers.</td>
<td>Retailers are the primary point of contact for residential and commercial customers. They coordinate connections and manage billing and payments.</td>
<td>The traditional flow of electricity supply is changing. Around one in five South Australian homes now combines the electricity they draw from the network with power generated by rooftop solar panels, and also contributes surplus electricity back to the network.</td>
</tr>
</tbody>
</table>
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

Security Classification: Public
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
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

Security Classification: Public
Applicable regulation

**National**

- Makes the Rules that govern the market
  - AEMC

- Operates power system and National Electricity Market
  - AEMO

- Regulates energy markets and networks under legislation
  - AER

**State**

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

- Office of the Technical Regulator - Safety and technical compliance
  - Government of South Australia
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](http://www.aer.gov.au)
RIT-T process

- **TNSP identifies network limitation and possible options**
  - TNSP prepares project specification consultation report (PSCR)
  - TNSP assesses submissions and makes adjustments as necessary
  - TNSP undertakes cost benefit assessment and determines “preferred” option

  **12 weeks for submissions**

- **TNSP prepares project assessment draft report (PADR)**
  - TNSP assesses submissions and makes adjustments as necessary
  - TNSP issues project assessment conclusions report (PACR)
  - AER undertakes dispute process if the outcome is disputed

  **6 weeks for submissions**

  **30 days to raise a dispute**

**TNSP** = Transmission Network Service Provider

We are here (PSCR published 28 April 2017)
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 Code\(^1\) specifies minimum reliability standards

<table>
<thead>
<tr>
<th>Exit point</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middleback (Category 1)</td>
<td>• Provide “N” equivalent line and transformer capacity for 100% of contracted demand (i.e. with all transmission elements in service)</td>
</tr>
</tbody>
</table>
| Wudinna and Yadnarie (Category 2) | • 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)   | • 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](http://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

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

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Specification Consultation Report (PSCR) published</td>
<td>28 April 2017</td>
</tr>
<tr>
<td>Public forums</td>
<td>26 and 29 June 2017</td>
</tr>
<tr>
<td>Submissions on PSCR close</td>
<td>21 July 2017</td>
</tr>
<tr>
<td>Draft report (PADR) consultation and public forum</td>
<td>Q4 2017</td>
</tr>
<tr>
<td>Final report (PACR)</td>
<td>Q1 2018</td>
</tr>
</tbody>
</table>
Questions
Thank you

Rainer Korte
Phone: 08 8404 7983
Mobile: 0417 868 224
Email: korte.rainer@electranet.com.au