



Final Report

Maintaining Reliable Electricity Supply To Port Lincoln

17 October 2008

Version: 1.0



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GLOSSARY OF TERMS

ACCC	Australian Competition and Consumer Commission
Adelaide Central	That area of Adelaide which is located east of West Terrace, north of South Terrace, west of East Terrace, and south of the River Torrens.
Act	Electricity Act 1996
AER	Australian Energy Regulator
AEMC	Australian Energy Market Commission
AMD	Agreed Maximum Demand – for a connection point or a group of connection points, it is the demand specified as such in the connection agreement between ElectraNet and the relevant transmission customers or ETSA Utilities.
Application Notice	A notice made available to Registered Participants and Interested Parties pursuant to clause 5.6.6 of the Rules
Distribution Code EDC	South Australian Electricity Distribution Code – as issued by ESCOSA
DNSP	Distribution Network Service Provider
DM, DMS	Demand Management or Demand Side Management
ElectraNet	ElectraNet is the principal transmission network service provider in South Australia. It is a privately owned company that has a long term lease for the operation, maintenance, and development of the South Australian transmission system which comprises plant and equipment mainly operating at voltages of 132 kV and above. ElectraNet is registered with NEMMCO as a Transmission Network Service Provider (TNSP)
Equivalent Transformer Capacity	Capacity to transform energy to meet demand using means including, but not limited to: transmission system capability; network support arrangements. As defined in the ESCOSA Electricity Transmission Code
ESCOSA	Essential Services Commission of South Australia established under the Essential Services Commission Act 2002
ESDP	Electricity System Development Plan (ESDP) developed annually by ETSA Utilities and published by 30 June. The ESDP includes details of projected limitations on the ETSA Utilities Distribution system for at least the next three year period and provides the information needed for a party to register as an Interested Party as defined within ESCOSA Guideline 12
ETC	South Australian Electricity Transmission Code issued by ESCOSA

ETSA Utilities	ETSA Utilities is South Australia's principal Distribution Network Service Provider (DNSP), and is responsible for the distribution of electricity to all distribution grid connected customers within the State under a regulatory framework. ETSA Utilities is a partnership of Cheung Kong Infrastructure Holdings Ltd (CKI), Hong Kong Electric International Ltd (HEI), and Spark Infrastructure
Guideline 12 (GL 12)	ESCOSA Electricity Industry Guideline 12 – Demand Management for Electricity Distribution Networks
Market Participant	A person who has registered with NEMMCO as a Market Generator, Market Customer or Market Network Service Provider under Chapter 2
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company Limited
PV	Present Value
O&M	Operating and Maintenance
OLTC	On Load Tap Changer – a device used to control the output voltage of a transformer
QOS	Quality of Supply
RDP	Regional Development Plan
Registered Participant	A person who is registered with NEMMCO as a Network Service Provider, a System Operator, a Network Operator, a Special Participant, a Generator, a Customer or a Market Participant
Regulatory Test	The test promulgated by the AER, which all major regulated network augmentation investments must comply with
RFI	Request for Information
RFP	Request for Proposals
ROA	Return on Asset
Rules	National Electricity Rules (Rules) formerly the National Electricity Code (NEC)
TNSP	Transmission Network Service Provider
TUOS	Transmission Use of System charges applicable to Registered Participants in the NEM
VoLL	Value of Lost Load as measured in the NEM

EXECUTIVE SUMMARY

Introduction

Port Lincoln is situated on the southern tip of Eyre Peninsula, in the western region of South Australia. It is a major town on Eyre Peninsula and has a population of about 14,000.

Electricity supply to lower Eyre Peninsula is provided by a radial 132 kV transmission line that connects Whyalla, in the north, to Port Lincoln, about 260km to the south. An intermediate 132 kV substation is located at Yadnarie, which is approximately half way between Whyalla and Port Lincoln.

Electricity demand at the Port Lincoln connection point is expected to increase by approximately 3% per annum over the next ten years due to economic growth and spot-load increases that are anticipated to occur in response to local requirements.

ElectraNet is bound by the service obligations of the National Electricity Rules (NER) and the South Australian Electricity Transmission Code (ETC), with the ETC focussing primarily on supply reliability at individual connection points. The latest changes to the ETC, which came into effect on 1st July 2008, have had the effect of increasing the supply reliability requirements of the Port Lincoln connection point. ElectraNet must now ensure that the Port Lincoln connection point can provide 100% of the Port Lincoln load with (non-continuous) N-1 supply, rather than 66% as required under the previous ETC. In the event of a supply interruption at the Port Lincoln connection point as a result of a single contingency event, the new ETC service standards require that ElectraNet use best endeavours to restore *equivalent* transmission line capacity to supply 100% of the Agreed Maximum Demand (AMD) within one hour of the interruption.

As a consequence of the changes to the ETC supply obligations, ElectraNet has undertaken extensive planning studies to evaluate potential network and non-network options to address the transmission line capability requirements at the Port Lincoln connection point under single-contingency conditions.

This final report has been prepared for the purposes of clause 5.6.6(c) of the National Electricity Rules in relation to a proposal to establish new large transmission network assets. It contains the results of planning investigations and economic assessment of feasible supply options that will maintain the required level of reliability of supply at the Port Lincoln connection point. In accordance with the Regulatory Test prescribed by the Australian Energy Regulator (AER), the supply solution that meets the reliability requirements at the lowest present value cost will be implemented.

Options Considered

In November 2005 ElectraNet issued a 'Request for Information' paper to Registered Participants and interested parties. That paper invited submissions from potential non-network solution providers that would address the future Eyre Peninsula supply requirements.

Six submissions were received from both private and public sector electricity industry participants. ElectraNet has carefully reviewed those submissions and has included in its analysis viable augmentation options based on those proposals.

In addition to the submissions received, ElectraNet has independently developed transmission network augmentation options that will similarly address the capability limitations of the Port Lincoln connection point under a single supply contingency event.

The following two network options were identified by ElectraNet as the two most feasible network options, and were evaluated in detail to compare the present value of the costs of those two options, in accordance with the Regulatory Test:

Option	Description
Option 1	Port Lincoln generation support
Option 2	Construction of a single-circuit 132 kV transmission line between Cultana and Pt Lincoln

Evaluation and Conclusion

The Regulatory Test requires that, for reliability augmentations, the recommended option minimise the present value of the cost to the market, and therefore to end-use customers, of implementing that option, when compared with other options under a majority of reasonable scenarios.

The options were compared on an equivalent basis over a 15-year period, with the analysis for each also ensuring that any anticipated projects that may impact supply to the Port Lincoln Terminal connection point were taken into consideration.

The economic analysis in this final report identifies Option 1 (Port Lincoln Generation) as the least-cost solution under all reasonable scenarios considered over the 15-year analysis timeframe. Sensitivity analysis has shown that conclusion to be robust under a range of assumptions and scenarios.

With consideration of the above, this final report recommends that Option 1; the contracting by ElectraNet of local generation support; be adopted in order to satisfy the requirements of the ETC in relation to the Port Lincoln connection point. That option comprises:

- The establishment, by July 2009, of a 10 year network support services agreement for the provision of Port Lincoln-based generation support;
- The purchase of additional land adjacent the existing Port Lincoln substation; and
- The establishment of a new 33 kV bus at Port Lincoln for the purpose of connection of additional generation.

The present value of the estimated cost of this option is estimated to be \$64 million over the 15-year period commencing 2009/10. Costs are based on 2007 dollar values.

Introduction

The Port Lincoln load comprises a mixture of electrical loads, including residential, commercial, agriculture, and aquaculture.

ElectraNet previously met the now superseded July 2003 ETC transmission reliability requirements at the Port Lincoln connection point by contracting the local power station at Port Lincoln for generation network support services.

Due to the changes contained in the new ETC, which came into effect on 1 July 2008, and the consequent increase in the Port Lincoln connection point reliability requirements, ElectraNet has taken the opportunity to completely re-evaluate the impacts of the new ETC transmission reliability requirements for the Port Lincoln connection point to ensure that all feasible network solutions are given due consideration when identifying the preferred augmentation solution that will continue to maintain non-firm N-1 transmission capability at Port Lincoln, as required by the ETC.

In accordance with the NER, when a Transmission Network Service Provider (TNSP), such as ElectraNet, proposes to establish new large network assets to address network limitations, it is required to follow the public consultation process as prescribed under clause 5.6.6 of the NER. This final report concludes that public consultation process, and contains the following:

- the reasons the augmentation is required, including, why it is considered a 'reliability augmentation', as defined in the NER;
- feasible options available to address the future supply requirements, including non-network alternatives;
- the recommended solution, including the timetable for implementation; and
- an explanation of why the solution satisfies the Regulatory Test prescribed by the Australian Energy Regulator (AER).

This document recommends works to be undertaken to meet the reliability of electricity supply obligations at Port Lincoln. The recommendations are based on:

- increased reliability of supply requirements placed on ElectraNet for the Port Lincoln connection point, as detailed in the July 2008 ETC;
- consultation undertaken by ElectraNet to identify potential non-network options to address those future supply requirements; and
- analysis of all feasible options in accordance with the Regulatory Test.

The option being recommended by ElectraNet minimises the present value of the costs to Registered Participants in the National Electricity Market (NEM) while meeting the reliability standards in the NER and the ETC. It will allow ElectraNet to ensure a reliable supply at the Port Lincoln connection point during single network contingencies at the least cost to the market and therefore to end-use customers.

Background: Electricity Supply System

2.1. Geographic Area

Port Lincoln is situated on the southern tip of Eyre Peninsula, on the west coast of South Australia (refer Figure 1). Although Eyre Peninsula covers a significant geographic area, it is only sparsely populated, comprising about 2% of the South Australian population. The major population centres are at Whyalla (~25,000) and Port Lincoln (~14,000). There are several other rural centres on Eyre Peninsula, the major ones being Ceduna (~2,800), Streaky Bay (~1000), Cleve (~800), Cowell (~700), Kimba (~700), and Wudinna (~600).

The main industries on the peninsula are mining and steel manufacturing (at and near Whyalla, in the north-eastern part of the peninsula), grazing, agriculture and aquaculture (fish-farming).

The Port Lincoln load itself comprises a mixture of electrical loads, including residential, commercial, and light industrial.

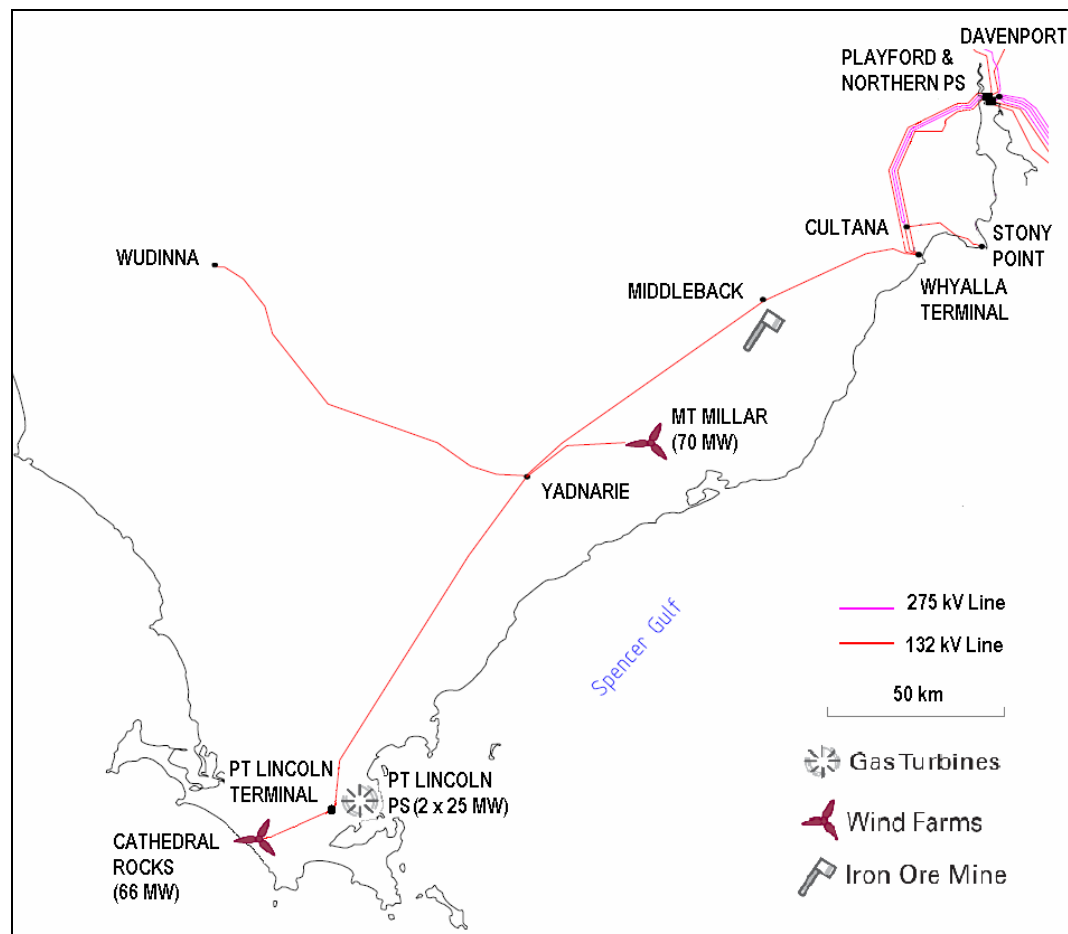


Figure 1 : Electricity transmission network and local generators

2.2. Existing supply arrangements

The present Eyre Peninsula 132 kV transmission system comprises a radial 132 kV line approximately 260 km in length, between Whyalla and Port Lincoln. An intermediate 132 kV substation is located on that line at Yadnarie (near Cleve), approximately half way between Whyalla and Port Lincoln. A radial 132 kV line extends out of Yadnarie to supply Wudinna, some 110km to the north-west. Middleback 132/33 kV substation is connected to the Whyalla-Yadnarie 132 kV line and provides electricity supply to the Iron Duke mine, which is operated by OneSteel.

ElectraNet's connection point at Port Lincoln supplies a 33 kV network which is owned and operated by ETSA Utilities and that provides bulk supply to a number of locations at the southern end of the peninsula.

ElectraNet currently has contracts in place with the local power station at Port Lincoln for the provision of generation network support services to supply the Port Lincoln load in the event that the radial transmission line from Whyalla to Port Lincoln is out of service. ElectraNet also uses the services of those generators to manage system-normal supply obligations to limit the transmission line loadings to levels that will ensure that the line does not operate beyond its design rating of 49°C under typical summer conditions.

2.3. Committed Network Developments

While there are no committed network developments that would address the supply reliability requirements at the Port Lincoln connection point for a single contingency (N-1) event, ElectraNet and ETSA Utilities have significant committed programmes of capital works that are specifically intended to address load growth within the Eyre Peninsula region. Those augmentations have been considered in the planning analysis described in this document.

Committed and envisaged works are detailed in ElectraNet's Annual Planning Review 2007. The most significant of those are:

- Initiating works to increase the operating temperature of the Whyalla–Yadnarie–Port Lincoln 132 kV transmission line. There is a need to upgrade the thermal rating of that line because it was constructed in the mid 1960's using British design criteria of the day, and consequently, has a design rating that is considerably less than that obtained from modern 132 kV lines using equivalent conductors.
- Splitting the Davenport to Cultana 275kV transmission line (presently run in parallel) into two separate circuits, installing a new 275/132kV transformer at Cultana, turning the two Playford to Whyalla 132kV lines into Cultana, and transferring the supply point for Lower Eyre Peninsula from Whyalla Terminal to Cultana substations.
- Rebuilding Whyalla Terminal substation.
- Augmenting the existing 275 kV Davenport substation by installing two 160MVA 275/132 kV transformers and constructing a new 132 kV substation adjacent the 275 kV extension. Those works will effectively replace the functionality of the ageing Playford A Substation.

- Coordinating the Playford connection point upgrade project with the above works, and installing two new 60 MVA 132/33 kV connection point transformers to replace the existing 25 MVA units that are presently installed at Playford A substation. As part of that related project, ETSA Utilities will construct a new 33 kV network bus adjacent the proposed 132 kV Davenport substation and re-route its existing 33 kV network from Playford A to Davenport substations to support connection to the new facility.

2.4. Existing and Committed Generation Facilities

Existing power generation facilities connected to the transmission network on Eyre Peninsula are detailed in Table 1. When those facilities are operating, they serve to reduce the amount of electricity that is required to be transferred into Eyre Peninsula via the transmission network.

Location	Type	Maximum Capacity
Pt Lincoln Power Station	Distillate Turbine	2 x 25 MW
Cathedral Rocks Wind Farm	Wind Turbine	66 MW
Mount Millar Wind Farm	Wind Turbine	70 MW

Table 1 : Existing Generation Facilities on Eyre Peninsula

Port Lincoln power station comprises two distillate-fuelled turbine driven generators that connect to ElectraNet's 132 kV bus at Port Lincoln, and provides back-up electricity supply capacity to the Port Lincoln area.

Because of the relatively high cost of fuel associated with those generators, they are normally only dispatched under the NEM at times of high pool prices, and this typically corresponds to periods when there is a shortage of other generation. However, this does not always correspond to times of high load on Eyre Peninsula. Consequently, normal NEM dispatch of the Port Lincoln generators cannot be relied upon to meet service obligations in the region.

There are currently two wind-turbine powered electricity generating stations (wind farms) in the Lower Eyre Peninsula region; one at Mount Millar, west of Cowell, and the other at Cathedral Rocks, south of Port Lincoln. The Cathedral Rocks wind farm comprises a total of 66 MW of wind driven generation that connects to the Port Lincoln 132 kV connection point, and is presently in service. The Mount Millar wind farm is undergoing commissioning and will ultimately comprise 70 MW of installed generation.

Because of the unpredictable nature of the wind energy that powers the wind farms, those units are classified as 'unscheduled generators' in the NEM. Initial analyses undertaken by the Electricity Supply Industry Planning Council (ESIPC) suggest that about 15% of a wind farm's installed capacity could be considered as 'firm' on a state-wide basis, thereby providing a rough guide as to the amount of reliable generating capacity that can be expected from any particular wind farm. However, the ESIPC cautions that its analysis was based on state-wide diversity of weather/wind conditions, and that only over a broad-ranging geographic sample would the study results be applicable with any acceptable degree of certainty.

Given the relatively close geographic proximity of the two wind-farms on Eyre Peninsula, and the likelihood that peak demand will occur at times of high ambient temperatures (40°C and above) and low wind conditions, the ESIPC suggests that localised contribution from the wind-farms to supply Eyre Peninsula would be negligible. On that basis, ElectraNet has assumed the firm supply capacity provided by both the Mount Millar and Cathedral rocks wind farms to the Eyre Peninsula region to be 0 MW for planning purposes.

When isolated from the main transmission network (islanded operation), the Eyre Peninsula wind farms do not have the ability to supply local customer demand independent of other generating plant.

ElectraNet is not aware of any committed non-wind based generation proposals that will potentially impact the Port Lincoln connection point or the Eyre Peninsula 132 kV transmission network.

3. Response to the consultation process

ElectraNet issued an Application Notice on 3 December 2007 that contained a draft recommendation for proposed new large network assets to address future electricity supply requirements on Eyre Peninsula. The closing date for submissions to that Application Notice was 18th January 2008. The recommended scope included:

- Establishment of a generation network support service agreement for the provision of Port Lincoln-based generation back-up; and
- The purchase of additional land adjacent the existing Port Lincoln substation by summer 2009/10.

No submissions were received in response to that Application Notice.

4. Background: electricity demand

4.1. Overview

Electricity demand forecasts over a ten-year period are obtained from ETSA Utilities and direct-connect customers at each connection point on ElectraNet's transmission system. Those forecasts take account of demand-side management programmes in-place or foreseen by ETSA Utilities, and embedded generation which potentially has the effect of reducing the forecast of demand to be supplied via each transmission connection point.

The demand forecasts that underpin the recommendations of this final report are consistent with the ten-year demand and energy forecasts that are supplied by ETSA Utilities and published in ElectraNet's Annual Planning Review 2007.

4.2. Load forecast

The growth in electrical load in a region is dependent upon many variables, including economic growth, housing and commercial development, industrial growth, spot-load increases that occur in response to local requirements, and environmental conditions (predominately weather conditions).

The load forecasts for the four lower Eyre Peninsula connection points for the coming 10-year period, as provided by ETSA Utilities for Port Lincoln, Wudinna and Yadnarie, and by OneSteel for the Middleback connection point, are shown in Table 2. The forecast summer peak demand is based on medium growth, hot weather (10% Probability of Exceedance, or POE) and excludes transmission losses and generator auxiliary loads.

CONNECTION POINT	Units	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17
Year from Base		0	1	2	3	4	5	6	7	8	9	10
WUDINNA (ETSA Utilities)	MW	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.7	17.1	17.4
	PF	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.98
YADNARIE (ETSA Utilities)	MW	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.5	11.7	11.9
	PF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99
PORT LINCOLN TERMINAL (ETSA Utilities)	MW	33.9	34.9	36.0	37.0	38.1	39.3	40.5	41.7	42.9	44.2	45.5
	PF	0.90	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
MIDDLEBACK (Onesteel)	MW	2.0	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
	PF	0.90	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Diversity Total Load		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	MW	60.0	80.0	81.6	83.1	84.7	86.4	88.1	89.8	91.6	93.5	95.3

Table 2 : Lower Eyre Peninsula Forecast Summer peak Demand (medium economic growth)

4.3. Pattern of use

Peak demand on Eyre Peninsula is experienced in summer, and is mainly driven by high temperatures and the consequent high air conditioning loads. As a result, the area also has a high reactive power demand.

Customer demand information for Eyre Peninsula indicates that there is only minimal diversity between the loads supplied from the various connection points at times of peak demand, resulting in the total demand of all of the connection points having to be supplied by the 132 kV transmission line at times of maximum load in the region.

As can be seen from the daily load profile shown in Figure 1, summer weekday electricity demand on Eyre Peninsula remains high throughout the day, with little change in the demand from late afternoon to evening hours.

The daily profile of the load that the Whyalla-Port Lincoln transmission line supplies, as shown in Figure 1, does not include the impacts of the wind farms that are installed or undergoing commissioning on Eyre Peninsula.

While wind generation is not expected to make any measurable contribution to reducing the peak load on Lower Eyre Peninsula (hot weather generally correlates with minimal wind), it will alter the load shape significantly by reducing the average load supplied by the 132 kV transmission line from Whyalla, thereby making the daily load profile more 'peaky'.

As can be seen in Figure 2, the summer weekday load profile at the Port Lincoln connection point is very similar to the Eyre Peninsula load profile, remaining high throughout the day, with relatively small change in demand during daylight and evening hours. The load duration curve for the demand at the Port Lincoln connection point over a 12 month period is shown in Figure 3.

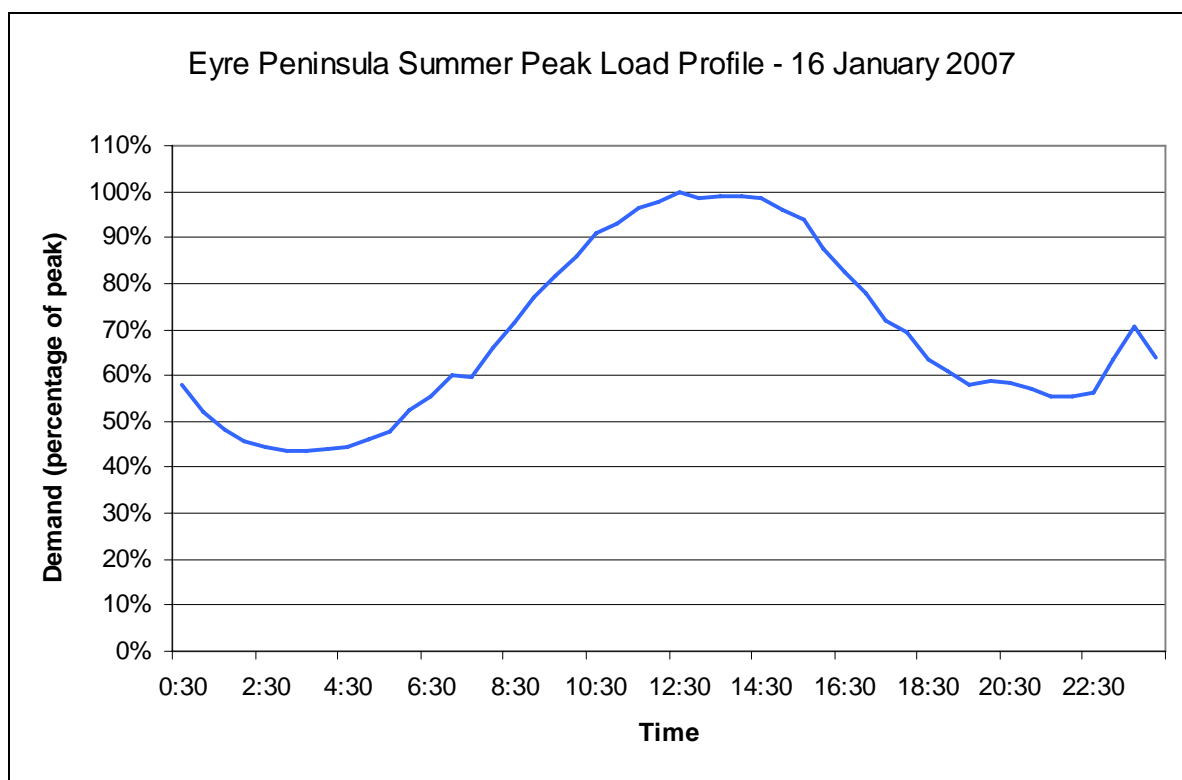


Figure 1 : Lower Eyre Peninsula Daily Load Curve – Summer 2006/07

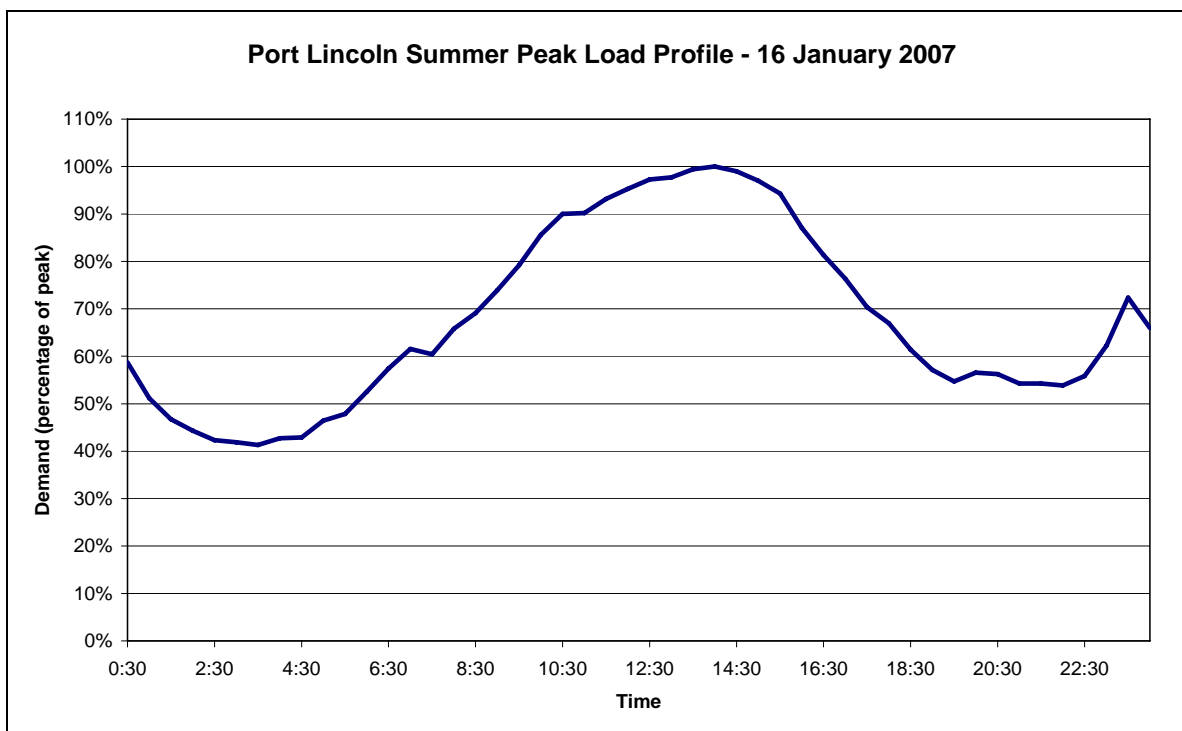


Figure 2 : Port Lincoln Daily Load Curve – Summer 2006/07



Figure 3 : Load duration curve for Port Lincoln – Summer 2006/2007

4.4. Potential Major Load Increases

There are several proposed industrial developments that will contribute to the ongoing increase in forecast demand on Eyre Peninsula. They include expansions to existing customer loads and potential new loads in the regions of Stony Point, Ceduna and Middleback. Such projects will only be included in the load forecasts if they become committed or highly probable. ElectraNet is in regular discussion with the project proponents and relevant stakeholders to ensure that the proposed augmentation is consistent with future developments. The load forecast in Table 2 does not include any uncommitted major industrial load developments.

5. Service Obligations

As a Transmission Network Service Provider operating in the South Australian jurisdiction of the National Electricity Market, ElectraNet is bound by the service obligations of the National Electricity Rules (NER, or Rules), and the Electricity Transmission Code. The NER and the ETC place differing obligations on ElectraNet, with the Rules focussing on power system security and quality of supply, and the ETC focussing on supply reliability at individual connection points.

5.1. National Electricity Rules

The Eyre Peninsula 132 kV system south of Whyalla is a radial network that is operated as part of the shared transmission system under the NER. Schedule 5.1.2.1 of the NER (version 21) requires a TNSP to plan, operate and maintain its power system to allow the transfer of power from generators to customers with all transmission facilities in service. However, because of system security considerations, this obligation requires the non-radial, or meshed, portions of the power system to be planned on a single credible contingency (N-1) basis. The NER also specifies the acceptable voltage levels that should be provided at the connection points.

5.2. South Australian Electricity Transmission Code

ElectraNet is also bound by the service obligations of the South Australian Electricity Transmission Code (ETC). As mentioned, the ETC focuses primarily on supply reliability at individual connection points.

The ETC assigns reliability standards for each connection (exit) point or group of connection points within the transmission network, and thereby imposes specific requirements on ElectraNet for planning and developing its transmission network in order that it meet those requirements. The ETC also includes additional obligations with regard to response times, spares holdings, and reporting requirements.

From the 1st of July 2008, the Port Lincoln connection point has been classified as a Category 3 load under the ETC (ET/05), meaning that ElectraNet is now obliged to provide equivalent transmission line capacity for at least 100% of the Agreed Maximum Demand (AMD) under a single contingency event (rather than 66% of AMD as in the previous ETC), and 100% equivalent transformer capacity with the loss of the largest transformer at the Port Lincoln connection point.

The new ETC permits transmission line or transformer capacity to be provided by an alternative network support arrangement, including transmission or distribution system support, generation, or demand side measures up to a limit of 120% of transformer or transmission line capacity.

While the ETC allows alternative network support arrangements to be implemented to meet the transmission line and transformer capacity requirements at Port Lincoln, the required capacity needs to be available within a prescribed time on at least 95% of the occasions on which it is sought to be utilised, in any 12-month (financial year) period.

In the event of an interruption at the Port Lincoln connection point as a result of a single contingency event (N-1), the ETC requires ElectraNet to use best endeavours to restore equivalent transmission line or transformer capacity to supply 100% of the AMD within one hour of the interruption. Following an interruption event, best endeavours are to be used to restore system normal transformer capacity, while system normal line capacity is required to be restored within 2 days.

The other connection points on Lower Eyre Peninsula, which include Middleback, Yadnarie and Wudinna, are category 1 and 2 loads, and only require transmission line capacity for 100% of the AMD under N, or 'system normal', operating conditions.

The new ETC reliability standard sets the timeframe for when ElectraNet must comply with the new changes to the ETC that came into effect from the 1st of July 2008, and includes using best endeavours to meet the connection point reliability standards within 12 months, or by July 2009, or in any case 3 years from when the new ETC changes came into effect (by July 2011).

The July 2008 ETC can be viewed in its entirety at the following website:

<http://www.escosa.sa.gov.au/webdata/resources/files/060906-R-ElecTransCodeET05.pdf>

6. Network Capability and Future Supply Requirements

In order to meet the ETC Category 3 reliability standards at the Port Lincoln connection point, ElectraNet will require network support levels equal to the Port Lincoln Terminal demand levels shown previously in Table 2. That is, in the event that the 132kV transmission line is out of service, any network support agreement must be capable of supplying the entire Port Lincoln Terminal demand.

Those required network support levels are presently provided by two (nominally rated) 25 MW distillate-fuelled turbine generators, each having a rating of 21 MW under summer operating conditions, and are contracted with ElectraNet to provide back-up capacity to the Port Lincoln region. However, that contract for generation network support services at Port Lincoln is soon to expire.

In addition, with the installation of a third 132/33 kV transformer and the connection of the Cathedral Rocks Wind Farm at Port Lincoln in 2004 and 2005 respectively, ElectraNet's substation at Port Lincoln has severe physical space limitations. The Port Lincoln 132 kV bus is currently configured in a mesh arrangement with six exits, and has no provision for further expansion. ElectraNet has taken account of that limitation by purchasing sufficient land adjacent the existing substation on which to extend the substation's 33kV switchyard.

Given the timing of the expiration of the existing Network Support Services contract and the changes to ETC supply obligations, ElectraNet has sought to evaluate all feasible options to provide network support at Port Lincoln, including a continuation of the current solution, to provide for a secure long-term electricity supply to the Port Lincoln region.

7. Options considered

Background

Relevant industry participants and interested parties were consulted in the period from late 2005 through to July 2007 regarding the future supply requirements at Port Lincoln, and information was requested on potential non-network alternatives that could address those requirements in place of network augmentation. A number of practicable non-network alternatives were identified during the consultation process.

ElectraNet's demand and energy forecasts already consider all existing demand-side management initiatives, such as routine hot water switching, which are incorporated in the demand forecasts provided by ETSA Utilities. A stand-alone Demand Side Management (DSM) solution is not a practical option in this case, as it would require 100% DSM of the Port Lincoln load for an N-1 contingency event. It is important to keep in mind that any DSM program will only reduce the load, and can not contribute to reliability improvements.

The load forecasts also include an allowance for any potential co-generation and renewable energy developments embedded in the distribution networks.

ElectraNet has considered a number of alternative options and has identified and evaluated two feasible development options to address the N-1, or single contingency, transmission line capability requirement at Port Lincoln. Those options are listed below in Table 3.

Option	Description
Option 1	Port Lincoln generation support
Option 2	Construction of a single-circuit 132 kV transmission line between Cultana and Pt Lincoln

Table 3 : Feasible Network and Generation Development Options

Localised Generation Network Support Services

ElectraNet issued a Request for Information (RFI) Paper to registered participants and interested parties in November 2005 on the Eyre Peninsula limitations, and as part of that RFI, invited submissions for potential non-network solutions. Two of the six submissions received by ElectraNet in response to that RFI included localised generation at Port Lincoln.

In assessing the option of using localised generation at Port Lincoln, while ensuring that any generation service meet the reliability criteria for network support arrangements as defined in the ETC, ElectraNet developed a technical specification specifically for the provision of generation network support services at Port Lincoln. ElectraNet then undertook a selective tendering process, subject to

the AER regulatory consultation process, with five generation proponents. The five generation proponents were selected based on the fact that they had either responded to the RFI with a generation solution or had previously engaged in discussions with ElectraNet on the provision of supplying network support services to ElectraNet. The preferred generation supplier would be the supplier that met the ETC reliability criteria and that had the lowest overall (fixed and operational) costs over a 15-year period, in order to minimise the PV cost as required under the AER Regulatory Test. The fixed and operational costs of the preferred generation supplier have been incorporated into the generation option.

In the development of the technical specification for the generation network support services at Port Lincoln, consideration was given to using a five year contract term for the provision of network support services, which would align with ElectraNet's revenue reset period and major ETC revisions. However, a contract period of five years was deemed to be too short, as a new generation provider would have no revenue certainty after five years despite its major capital outlay to establish a new power station. Therefore, to ensure that the tendering process for the generation network support service at Port Lincoln was competitive and provided the lowest cost to the end user, the contract term for generation network support services was extended to 10 years. A contract term beyond 10 years was considered, but it was found that increasing the term of the Network Support Services contract would not provide competition and/or flexibility for alternative augmentation solutions (which could include generation solutions) for future load growth on Eyre Peninsula.

7.1. Option 1 : Port Lincoln generation

Date	Description
2008/09	<ol style="list-style-type: none"> 1. Establishment of generation network support service agreement for the provision of Port Lincoln based power station capacity. 2. The purchase of additional land adjacent the existing Port Lincoln substation 3. Extending the existing 33kV bus by constructing a new 33kV bus adjacent the existing substation, with the provision to connect 33kV generation

Table 4 : Option 1 Augmentation timing

Option 1 involves establishing a generation network support service agreement at Port Lincoln with the preferred tender, as discussed above.

The connection of a new generator/s at Port Lincoln will require purchasing additional land and the establishment of a new 33 kV bus. As mentioned in Section5, the existing substation configuration does not readily support further expansion and does not facilitate the connection of additional generation capacity at 132kV.

To enable additional generator/s to be connected at Port Lincoln substation, studies confirm that the lowest-cost option is to build a new 33 kV bus rather than expand the existing 132 kV bus. The apportioned cost associated with the establishment of the 33 kV bus specifically for the connection of new generator/s

will be borne by the Generation Supplier, and as such, those costs have been included in the network support services contract.

As discussed above, the term of the network support contract has been set to 10 years. However, to cover the economic analysis period of 15 years, this option (Port Lincoln Generation) assumes that some form of network support contract, whether it be an extension of the proposed contract or an alternate arrangement, will be negotiated for the remaining five years of the fifteen-year period, and that the cost associated with that extension will be in line with the cost escalation provisions of the proposed contract.

The present value of the estimated cost of Option 1 is \$ 64 M, which includes extending the Network Support Generation costs to cover the 15 year analysis period, additional land at Port Lincoln substation, the construction on that additional land of a new section of 33kV bus to accommodate generation connections, and accounts for the anticipated changes in transmission losses on Eyre Peninsula that are attributable to this option.

7.2. Option 2 : Single Circuit 132kV Transmission Line to Pt Lincoln

Date	Description
08/09	Continuation of the existing generation network support services agreement at Port Lincoln for two years
08/09	Strategic land purchase of additional land adjacent the existing Port Lincoln substation
10/11	Single Circuit 132 kV Transmission Line – Cultana to Pt Lincoln

Table 5 : Option 2 Augmentation timing

The main element of this option involves the construction of a single-circuit 132 kV transmission line between Cultana and Pt Lincoln substations in 2010/11. This option requires the contracting of generation support services for the period until the line is commissioned in 2010/11.

The present value of the estimated cost of Option 2 is \$ 124 M, which includes the items listed in table 5 and the changes in anticipated transmission losses on Eyre Peninsula attributable to this option.

8. Scenarios considered

8.1. Assumed Market Development Scenarios

The AER Regulatory Test requires that options to address network limitations be assessed against a number of reasonable scenarios. Those scenarios need to consider:

- The existing system;
- Future network developments;
- Variations in load growth;
- Committed generation and demand side developments; and
- Potential generation and demand side developments.

The purpose of this approach is to ensure that the identified solution is robust under a range of plausible scenarios and contributes to the long-term development of the transmission network.

8.1.1. Existing and future transmission network development

ElectraNet intentionally did not investigate any market development scenarios that relate to new network developments proposed by ElectraNet outside of the Eyre Peninsula Region since they are independent of the future supply requirements that are the subject of this report, and are considered to be common to all options analysed. Future network developments that are relevant to the Port Lincoln connection point reliability have been included as anticipated/ modelled projects in the analysis.

8.1.2. Variations in demand growth

Three scenarios have been developed to consider sensitivity to variations in forecast customer electricity demand:

Scenario	Forecast Electricity Demand Level
Scenario A	Medium demand forecast applied
Scenario B	Low demand forecast applied
Scenario C	High demand forecast applied

Table 6 : Load Growth Scenarios

Those scenarios are based on hot weather (10% probability of exceedance) forecasts for electricity usage with varying levels of economic growth. The forecasts include all known information regarding existing and planned demand-

side initiatives, and include independent forecasts of existing and planned local embedded generation.

8.1.3. Existing and committed generators and demand-side developments

As noted in section 2.4 of this report, ElectraNet is not aware of any committed generator proponents proposing establishment in the Eyre Peninsula Region prior to 2008. For this reason, no scenarios have been developed in which the output of existing and/or committed generators is increased. Similarly, there are no relevant, committed demand-side management initiatives that would practically meet the Port Lincoln reliability supply requirements.

8.1.4. Potential new generation

ElectraNet is not aware of any well-advanced proposals for major new generators capable of providing suitable supply capacity to the Lower Eyre Peninsula region, and consequently, no development scenarios have been developed to consider the establishment of major new stand-alone generators in the Eyre Peninsula region.

9. Format and Inputs to Analysis

9.1. Regulatory Test Requirements

The requirements for the comparison of options to meet future supply requirements are contained in the AER Regulatory Test.

The Regulatory Test requires that, for reliability augmentations, the recommended option be the option that “minimises the present value of costs compared with a number of alternative options in a majority of reasonable scenarios”.

The Regulatory Test contains guidelines for the methodology to be used to identify the lowest-cost option. For example, information to be considered includes construction, operating and maintenance costs, the cost of complying with existing and anticipated laws and regulations, and reasonable forecasts of the ‘efficient operating costs of competitively supplying energy to meet forecast demand’. However, the Regulatory Test specifically excludes indirect costs and costs that cannot be measured as a cost in terms of financial transactions in the electricity market.

9.2. Inputs to the analysis

A solution to meet the future transmission line capacity requirement under a single contingency (N-1) at Port Lincoln as outlined in this document, is required to satisfy reliability requirements linked to Schedule 5.1 of the National Electricity Rules, and the requirements of the South Australian Electricity Transmission Code.

According to the AER Regulatory Test, this means that the costs of all options must be compared and the least cost solution is considered to satisfy the Regulatory Test. The results of this evaluation, carried out using a discounted cash flow model to determine the present value (PV) cost of the various options, are shown in section 10.1.

Cost inputs to the economic analysis are described below.

9.3. Cost of network augmentations

The capital cost to implement each of the feasible options and the anticipated/modelled projects outlined in Section 7 has been estimated by ElectraNet. Sensitivity studies have been carried out using variations in the capital cost estimates of plus and minus 25% in order to determine whether this affects the relative rankings of the options under consideration (see section 9.2).

The financial analysis considers all foreseeable cost impacts to market participants of the proposed network augmentations, as defined by regulatory processes. ElectraNet is required to evaluate options for new transmission developments under the Regulatory Test in accordance with clause 5.6 of the National Electricity Rules.

10. Economic Analysis

10.1. Present Value Analysis

Financial analysis was carried out to calculate and compare the present value of the costs to market participants of each option under a range of assumed scenarios.

A fifteen-year study period was selected as an appropriate period for financial analysis. A discount rate of 7.17% was selected as the commercial discount rate, and sensitivity analysis was conducted to test that assumption.

Under the Regulatory Test, it is the ranking of the options that is important, rather than the actual present-value results. That is because the Regulatory Test requires that the recommended option have the lowest present value of costs compared with alternative options in a majority of reasonable scenarios.

The following table summarises the results of the economic analysis. It shows the present value of costs for each alternative and identifies the best-ranked option in each of the various scenarios considered.

The summary shows that Option 1 has the lowest present value of costs under all of the credible scenarios modelled.

Discount rate = 7.17%	Scenario A		Scenario B		Scenario C	
	<i>Medium demand growth</i>		<i>High demand growth</i>		<i>Low demand growth</i>	
	NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank
Option 1 Port Lincoln Generation	63.8	1	64.0	1	63.6	1
Option 2 Single Circuit 132 kV Transmission line	123.6	2	123.9	2	123.5	2

Table 7 : Summary of economic analysis for development options

As Option 1 has the lowest present value cost for all scenarios considered, it therefore satisfies the Regulatory Test.

10.2. Sensitivity Analysis

In addition to examining the impact of a range of reasonable scenarios, the sensitivity of the option-ranking to variations in other critical parameters was also examined. The base-case assumptions and the range over which they were varied are shown in Table 8.

Parameter	Base-case value	Sensitivity range
Real Discount Rate	7.17%	5% and 9%
Cost of Losses	\$30/MW.h	\$25/MW.h and \$35/MW.h
Capital Costs	Nominal Value	+/-25% Increase

Table 8 : Base-case values and range of values used in sensitivity studies

The results for the base-case and sensitivity tests are shown in Table 9.

		Base Case		12% Discount		8% Discount		25% Increase in Capital		25% Decrease in Capital		Losses at \$25/MW h		Losses at \$35/MW h	
		NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank	NPV (\$M)	Rank
Option 1	Port Lincoln Generation	64	1	57	1	74	1	65	1	63	1	62	1	65	1
Option 2	Single Circuit 132kV Transmission line	124	2	109	2	144	2	150	2	97	2	122	2	125	2

Table 9 : Comparison of Options – Results of Sensitivity studies

From those results, it can be seen that in each case Option 1 is the lowest cost option.

11. Summary and Conclusions

The following conclusions have been drawn from the analysis presented in this report:

- The augmentation proposed in this document is defined as a “reliability augmentation” under the NER as it is required to meet the reliability standards under the ETC at the Port Lincoln connection point.
- As a consequence of the changes to the ETC supply obligations and the timing of the expiration of the existing Network Support Services contract, planning studies have been undertaken to evaluate potential network and non-network options to address the transmission line capability requirement at Port Lincoln under a single contingency (N-1). Two augmentation options were evaluated in detail.
- In order to meet the South Australian Electricity Transmission Code service standards at the Port Lincoln connection point, ElectraNet will require network support levels equal to the Port Lincoln connection point demand levels shown in Table 2 of this report.
- In the event of a supply interruption at the Port Lincoln connection point as a result of a single contingency event (N-1), the new ETC service standards require ElectraNet to use best endeavours to restore equivalent transmission line capacity to supply 100% of the Agreed Maximum Demand within one hour of the interruption.
- To comply with the new changes to the ETC service standards, which came into effect from the 1st of July 2008, ElectraNet must use best endeavours to meet the connection point reliability changes within 12 months (by 1 July 2009), and in any case, 3 years from when the new ETC changes came into effect (by 1 July 2011).
- There is no acceptable “do-nothing” option. The Port Lincoln connection point reliability requirement as defined in the July 2008 ETC will not be met should no action be taken.
- ElectraNet issued an RFI paper inviting potential non-network solutions in November 2005. A total of six submissions were received. Of those submissions, two options were identified as being viable non-network options.
- Economic analysis completed in accordance with the Regulatory Test has identified that the proposed augmentation (Option 1 - Port Lincoln Generation) is the least-cost solution over the 15-year period of the analysis in all credible scenarios considered. Sensitivity testing has demonstrated that that finding is robust to variations in capital cost and other assumptions, and that the relative ranking of the options does not change as a result of those variations. Option 1 is therefore considered to satisfy the Regulatory Test.
- No submissions were received in response to the preceding Application Notice.
- It is anticipated that construction of additional generation facilities at Port Lincoln will commence in late 2008, with completion by July 2009.

12. Recommendation

Based on the conclusions drawn from ElectraNet's analysis and the absence of submissions to the preceding Application Notice, ElectraNet will proceed with the recommendations contained within that report; namely, that ElectraNet will undertake the following in order to address future supply requirements at the Port Lincoln connection point:

- Establish a 10 year Network support service agreement with a service provider for the provision of generation support from a Port Lincoln based power station by July 2009;
- Purchase additional land adjacent the existing Port Lincoln substation; and
- Establish a new 33 kV bus at Port Lincoln for the connection of additional generator/s;

at an estimated present value cost of \$64M over the 15-year period from commissioning.

The implementation of this recommendation will commence in late 2008.

Appendix A Financial Analysis Option 1A

Option 1A		Synergen Generation																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23		
Scenario A		Excludes uncommitted generation																
Component 2																		
	0.38	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* WDV	0.38	0	0.400	0.392	0.384	0.376	0.368	0.360	0.352	0.344	0.336	0.328	0.320	0.312	0.304	0.296	0.288	
* Depreciation over	50	0	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
* Opex	0.025	0	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
* WACC	0.0717	0	0.029	0.028	0.028	0.027	0.026	0.026	0.025	0.025	0.024	0.024	0.023	0.022	0.022	0.021	0.021	
=> TUOS		0	0.047	0.046	0.046	0.045	0.044	0.044	0.043	0.043	0.042	0.042	0.041	0.040	0.040	0.039	0.039	
=> NPV of TUOS	\$0.39																	
Component 3																		
	2.46	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* WDV	2.46	0	2.580	2.528	2.477	2.425	2.374	2.322	2.270	2.219	2.167	2.116	2.064	2.012	1.961	1.909	1.858	
* Depreciation over	50	0	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	
* Opex	0.025	0	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	
* WACC	0.0717	0	0.185	0.181	0.178	0.174	0.170	0.166	0.163	0.159	0.155	0.152	0.148	0.144	0.141	0.137	0.133	
=> TUOS		0	0.301	0.297	0.294	0.290	0.286	0.283	0.279	0.275	0.271	0.268	0.264	0.260	0.257	0.253	0.249	
=> NPV of TUOS	\$2.52																	
Annual Generation Cost																		
* Cost		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
=> NPV of Losses	\$49.23	0	4.455	4.589	4.726	4.868	5.014	5.131	5.472	5.637	5.806	5.980	6.380	6.571	6.769	6.972	7.181	
Generation Operation Cost																		
* Cost		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
=> NPV of Losses	\$2.79	0	0.232	0.242	0.254	0.267	0.279	0.292	0.307	0.322	0.337	0.354	0.371	0.388	0.408	0.428	0.450	
Relative Losses																		
* Loss saving MW		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* Losses \$		0	3.631	3.688	3.746	3.733	3.719	3.711	3.703	3.709	3.715	3.750	3.785	3.851	3.917	3.873	3.829	
=> NPV of Losses	\$8.85	0	0.954	0.969	0.984	0.981	0.977	0.975	0.973	0.975	0.976	0.986	0.995	1.012	1.029	1.018	1.006	
Total for Scenario A	\$63.78																	
Scenario C		High demand growth																
Component 2																		
	0.38	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* WDV	0.38	0	0.400	0.392	0.384	0.376	0.368	0.360	0.352	0.344	0.336	0.328	0.320	0.312	0.304	0.296	0.288	
* Depreciation over	50	0	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
* Opex	0.025	0	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
* WACC	0.0717	0	0.029	0.028	0.028	0.027	0.026	0.026	0.025	0.025	0.024	0.024	0.023	0.022	0.022	0.021	0.021	
=> TUOS		0	0.047	0.046	0.046	0.045	0.044	0.044	0.043	0.043	0.042	0.042	0.041	0.040	0.040	0.039	0.039	
=> NPV of TUOS	\$0.39																	
Component 3																		
	2.46	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* WDV	2.46	0	2.580	2.528	2.477	2.425	2.374	2.322	2.270	2.219	2.167	2.116	2.064	2.012	1.961	1.909	1.858	
* Depreciation over	50	0	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	0.0516	
* Opex	0.025	0	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	0.0645	
* WACC	0.0717	0	0.185	0.181	0.178	0.174	0.170	0.166	0.163	0.159	0.155	0.152	0.148	0.144	0.141	0.137	0.133	
=> TUOS		0	0.301	0.297	0.294	0.290	0.286	0.283	0.279	0.275	0.271	0.268	0.264	0.260	0.257	0.253	0.249	
=> NPV of TUOS	\$2.52																	
Annual Generation Cost																		
* Cost		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
=> NPV of Losses	\$49.23	0	4.455	4.589	4.726	4.868	5.014	5.131	5.472	5.637	5.806	5.980	6.380	6.571	6.769	6.972	7.181	
Generation Operation Cost																		
* Cost		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
=> NPV of Losses	\$2.89	0	0.234	0.246	0.258	0.272	0.286	0.301	0.316	0.333	0.351	0.369	0.389	0.410	0.433	0.456	0.481	
Relative Losses																		
* Loss saving MW		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* Losses \$		0	3.665	3.746	3.733	3.717	3.707	3.708	3.715	3.750	3.809	3.861	3.884	3.829	3.963	3.713	3.651	
=> NPV of Losses	\$8.89	0	0.963	0.984	0.981	0.977	0.974	0.974	0.976	0.988	1.001	1.023	1.021	1.006	1.041	0.976	0.956	
Total for Option 1	\$63.92																	
Scenario D		Low demand growth																
Component 2																		
	0.38	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	
* WDV	0.38	0	0.400	0.392	0.384	0.376	0.368	0.360	0.352	0.344	0.336	0.328	0.320	0.312	0.304	0.296	0.288	
* Depreciation over	50	0	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
* Opex	0.025	0	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
* WACC	0.0717	0	0.029	0.028	0.028	0.027	0.026	0.026	0.025	0.025	0.024	0.024	0.023	0.022	0.022	0.021	0.021	
=> TUOS		0	0.047	0.046	0.046	0.045	0.044	0.044	0.043	0.043	0.042	0.042	0.041	0.040	0.040	0.039	0.039	
=> NPV of TUOS	\$0.39																	
Component 3																		
	2.46	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/1					

