TNM-GR-809-1044

Issue 1.0, May 2010

FINAL REPORT

PROPOSED NEW SMALL TRANSMISSION NETWORK ASSET

AND

PROPOSED LARGE DISTRIBUTION NETWORK ASSETS

DEVELOPMENT OF THE ELECTRICITY SUPPLY NETWORK IN THE KINGSTON AREA

FINAL

UNCONTROLLED WHEN PRINTED

CONTACT

Refer to Section 7 of this Final Report.

RESPONSIBILITIES

Compliance

Refer to Appendix B of this Final Report.

Document Management

This document is the joint responsibility of:

- Transend's Asset Strategy & Planning Group, Transend Networks Pty Ltd, ABN 57 082 586 892

- Aurora's System and Asset Management Group within the Network Division of Aurora Energy Pty Ltd ABN 85 082 464 622.

Disclaimers

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EXECUTIVE SUMMARY

This final report has been prepared in accordance with clause 5.6.6A (e) of the National Electricity Rules (NER).

Transend Networks Pty Ltd (Transend) as the Tasmanian Transmission Network Service Provider (TNSP), and Aurora Energy Pty Ltd (Aurora) as the Tasmanian Distribution Network Service Provider (DNSP) have obligations under the National Electricity Rules (NER) and the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* (EI Regulations), to ensure that the State's transmission and distribution networks meet the required minimum performance standards.

Transend and Aurora have identified existing and emerging transmission and distribution network limitations within the Kingston area. In addition, Aurora has submitted a connection application to Transend requesting that a new 110/33 kV connection point be established in the Kingston area by May 2012.

In accordance with the requirements of clause 5.6.2(c) of the NER, Transend and Aurora have undertaken joint planning to identify alternative options and establish plans to address the existing and emerging network limitations. As part of the planning process, Transend and Aurora have conducted a joint consultation, and have prepared this final report in accordance with the requirements of clause 5.6.2(h) of the NER.

A summary of the application notice was published on the Australian Energy Market Operator's (AEMO) website on 24th February 2010. Registered participants and interested parties were invited to make submissions by 1st April 2010. No submissions were received.

For the purposes of the application notice and this final report, the Kingston area is considered the area south of Hobart that extends from Mount Nelson to Margate, including Kingston, Blackmans Bay, Margate and Electrona. This area can be predominately characterised as residential, rural residential and rural, centred around the large business district at Kingston with some smaller light industrial and commercial centres distributed throughout the area. The Kingston area is currently supplied from Transend's 110 kV network via Kingston and Electrona substations. These substations supply Aurora's 11 kV inter-connected distribution network in the Kingston area.

In undertaking joint planning, Transend and Aurora considered a number of area development growth scenarios, as well as planned residential and commercial developments. As part of the demand and energy forecasting process, consideration was also given to the impact of recent global economic events, as well as the potential impact of the proposed Carbon Pollution Reduction Scheme (CPRS) on the different growth scenarios.

Transend and Aurora have conducted studies of the transmission and distribution networks in the Kingston area over a 25 year planning period commencing in 2009. These studies identified a number of existing and emerging network limitations. In order to manage the existing limitations for the short term, Transend and Aurora have adopted operational strategies to enable the optimum utilisation of available capital resources and to strategically address the broader emerging supply limitations within the Kingston area. These operational strategies do not provide a suitable long term solution given the increasing load and emerging supply constraints in the area.

Under the medium (expected) winter demand forecast for the Kingston area, the existing transmission network supply arrangements will not meet the requirements of the requirements of the NER and *Electricity Supply Industry (Network Performance Requirement) Regulations* beyond 2013. Consequently, any transmission network augmentations that arise out of the inability of the current network to meet these requirements are reliability augmentations in accordance with the NER. Furthermore, the current distribution supply arrangements will be unable to meet the required service

standards by the winter of 2013 and beyond.

To address the existing and emerging network limitations, Transend and Aurora have considered a range of alternative options – covering both network and non-network solutions. Given existing levels of information, both Transend and Aurora are of the view that there are currently no practical non-network solutions available to address the identified network limitations in the Kingston area. Genuine proponents of viable non-network solutions to address the identified supply limitations were encouraged to submit proposals in response to the application notice.

After a process of considering the technical and economic feasibility of a wide range of investment options, four network alternatives were selected as being practical alternatives to address the identified supply limitations. These are presented in Table 0-1.

Table 0-1 – Summary of network augmentation options

Option	Transmission Augmentation	Distribution Augmentation
Option 1 Increase the capacity of the existing 11 kV connection point at Kingston Substation	• Installation of a third 110/11 kV 35 MVA transformer at Kingston Substation, connected in parallel with the existing two 110/11 kV 35 MVA transformers in 2012	• Augmentation of existing and additional 11 kV feeders in 2012 • Augmentation of existing and additional 11 kV feeders in 2014 • Installation of 11 kV 'express' feeders to Blackmans Bay area in 2015 • Installation of 11 kV express feeders to Margate area in 2016
	Future works	
	• New 110/11 kV connection point comprising two x 60 MVA transformers in 2023	• Augmentation of existing and additional 11 kV feeders in 2023 • Augmentation of existing and additional 11 kV feeders post 2024
Option 2 Establish a new 110/11 kV connection point in the Kingston business area now	• The establishment of a new substation at a location approximately 3 km from Kingston Substation at the high school site, comprising two 110/11 kV 60 MVA transformers in 2012	• Installation of 11 kV express feeders to Taroona area, augmentation of existing and additional 11 kV feeders in 2012 • Installation of additional 11 kV feeders in 2014 • Installation of 11 kV express feeders to Blackmans Bay area in 2015 • Installation of 11 kV express feeders to Margate area in 2016
	Future works	
	• New 110/11 kV two x 60 MVA connection point in 2035	• Augmentation of existing and additional 11 kV feeders post 2034

Option	Transmission Augmentation	Distribution Augmentation
Option 3 Establish a new 110/33 kV connection point at a site near the existing Kingston Substation	• Establishment of a new 110/33 kV connection point of at a site near Kingston Substation ,comprising two 110/11 kV 60 MVA transformers in 2012	• The installation of a two transformer 33/11 kV 25 MVA zone substation in the vicinity of Browns Road, 33 kV subtransmission feeders from the new 110/33 kV substation, and new 11 kV feeders in 2012 • Additional 11 kV feeders out of 'Browns Road Zone Substation' in 2014 • The installation of a two transformer 33/11 kV 25 MVA zone substation in the Blackmans Bay area, 33 kV subtransmission feeders from the new 110/33 kV substation, and new 11 kV feeders in 2019
	Future works	
	• The installation of a third 110/33 kV 60 MVA transformer at Kingston Substation in 2035	• Additional 11 kV feeders out of 'Blackmans Bay zone substation' in 2023 • The installation of a two transformer 33/11 kV 25 MVA zone substation in the Margate area, 33 kV subtransmission feeders from the installation of Kingston Substation, and new 11 kV feeders in 2029 • Additional 11 kV feeders out of 'Margate zone substation' post 2030
Option 4 Establish a new 110/33 kV connection point at the existing Kingston Substation	• The installation of two 110/33 kV 60 MVA transformers at the existing Kingston Substation in 2012	• The installation of a two transformer 33/11 kV 25 MVA Zone Substation in the vicinity of Browns Road, 33 kV subtransmission feeders from Kingston Substation, and new 11 kV feeders in 2012 • Additional 11 kV feeders out of 'Browns Road Zone Substation' in 2014 • The installation of a two transformer 33/11 kV 25 MVA Zone Substation in the Blackmans Bay area, 33 kV subtransmission feeders from Kingston Substation, and new 11 kV feeders in 2019
	Future works	

Option	Transmission Augmentation	Distribution Augmentation
	• The installation of a third 110/33 kV 60 MVA transformer at Kingston Substation in 2032	• Additional 11 kV feeders out of 'Blackmans Bay Zone Substation' in 2023 • The installation of a two transformer 33/11 kV 25 MVA zone substation in the Margate area, 33 kV subtransmission feeders from Kingston Substation, and new 11 kV feeders in 2029 • Additional 11 kV feeders out of 'Margate Zone Substation' post 2030

It was concluded that in all scenarios considered, Option 4 was the solution that provided the lowest present value of costs and that this option satisfied the reliability limb of the regulatory test. The economic assessment included sensitivity analysis on the key input variables – including area load growth, discount rate, and cost estimates.

Consequently, Transend and Aurora, have concluded their obligations under clause 5.6.2(f), 5.6.6(b) and 5.6.6A(d) of the NER and will proceed with implementing Option 4.The estimated capital investment of this option is presented in Table 0-2.

Table 0-2 – Summary of capital expenditure for the period 2010–2020

	Expenditure ($ million)	Financial year of commissioning
Transend	17.45	2011–12
Aurora	15.98 3.55 12.95	2011–12 2013–14 2018–19

Persons wishing to dispute any aspect of this final report, in accordance with clause 5.66A(c) of the NER are referred to section 7.

1 INTRODUCTION

Transend Networks Pty Ltd (Transend) is the Tasmanian electricity Transmission Network Service Provider (TNSP), and is responsible for the planning and development of the State's transmission network.

Aurora Energy Pty Ltd (Aurora) is the Tasmanian electricity Distribution Network Service Provider (DNSP), and is responsible for the planning and development of the State's subtransmission and distribution networks.

Transend and Aurora have responsibilities under the National Electricity Rules (NER), and local jurisdictional requirements. These responsibilities include planning to facilitate the economic development of the electricity networks, and ensuring ongoing compliance with the required network standards[1]. Meeting these obligations is important in addressing Aurora's needs, and in facilitating the operation of the National Electricity Market (NEM).

Transend has identified transmission network limitations in the Kingston area. In addition, Aurora has identified existing and emerging distribution network limitations in the Kingston area, and has submitted a connection application to Transend requesting that a new 110/33 kV connection point be established in the Kingston area by May 2012.

In accordance with the requirements of the NER, Transend and Aurora have undertaken joint planning to identify alternative options to address the existing and emerging network limitations. Through this joint planning process, Transend and Aurora have established plans which are set out in this final report.

1.1 PURPOSE

Transend and Aurora published an application notice in accordance with the requirements of clause 5.6.2(f) of the NER. A summary of the application notice was published on the Australian Energy Market Operator's (AEMO) website on the 25th of February 2010.

The application notice recommended the implementation of new small transmission assets and new large distribution assets as set out in option 4. In accordance with clause 5.6.2(f) 5.6.6A(d) of the NER, registered participants and interested parties were invited to make submissions in relation to the application notice by the 1st of April 2010 and no submission were received.

This final report has been prepared in accordance with the requirements of clause 5.6.2(h) and 5.66A(e) of the NER. This document sets out a detailed analysis of why the investment satisfies the regulatory test.

1.2 KEY REQUIREMENTS OF THE NER AND LOCAL JURISDICTION

Both Transend and Aurora are required under the NER to undertake a consultation process in relation to any proposed new small and new large network investments respectively. This section provides an overview of the key elements of those requirements.

1.2.1 Joint planning

In accordance with clause 5.6.2(b) of the NER, Transend conducts annual planning reviews with

[1] Network performance must comply with Schedule 5.1 of the National Electricity Rules, and with the requirements of the Tasmanian *Electricity Supply Industry (Network Performance Requirements) Act-1995*.

Aurora to consider the load forecast submitted by Aurora, and to review the adequacy of the existing connection points, the transmission network, and planning proposals for future connection points. Through this process, Transend and Aurora identified transmission and distribution limitations in the Kingston area, and the necessity for augmentation or a non-network alternative.

Transend and Aurora have undertaken joint planning to develop plans that can be considered by relevant Registered Participants, AEMO and interested parties. In addition, Transend's Annual Planning Reports of 2007, 2008 and 2009 and Aurora's annual planning reports of 2008 and 2009 provide descriptions of the existing and emerging limitations in the Kingston area.

1.2.2 NER compliance

Clause 5.6.6A(c) of the NER requires that the TNSP proposing to establish a new small transmission network asset not identified in their annual planning report must make available to all Registered Participants and AEMO a report which sets out certain matters as detailed in the NER. Due to this being a joint planning proposal, an application notice was issued. In addition, clause 5.6.2 of the NER sets out certain requirements in relation to a DNSP that is proposing the development of new large distribution network assets. For reference, details of the compliance with clauses 5.6.2 and 5.6.6A of the NER are set out in Appendix B of this final report.

1.2.3 Regulatory test requirements

The regulatory test is an analysis methodology used by network service providers in the NEM to assess the efficiency of network investment.

The Australian Energy Regulator (AER) publishes the regulatory test in accordance with clause 5.6.5A(a) of the NER.

Clause 5.6.5A(b) of the NER states that the purpose of the regulatory test is to identify new network investments or non-network alternative options that:

1) maximise the net economic benefit to all those who produce, consume and transport electricity in the market; or

2) in the event the option is necessitated to meet the service standards linked to the technical requirements of schedule 5.1 of the NER or in applicable regulatory instruments, minimise the present value of the costs of meeting those requirements.

The market benefit limb of the regulatory test relates to point 1), and the reliability limb of the regulatory test relates to point 2).

For transmission, Chapter 10 of the NER defines a reliability augmentation as:

'a transmission network augmentation that is necessitated principally by inability to meet the minimum network performance requirements set out in schedule 5.1 or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction'.

Section 4.1 of this final report addresses the requirements of clause 5.6.6(c)(6) of the NER which requires analysis of why the applicant considers that the asset is a reliability augmentation, and why the applicant considers that the asset satisfied the regulatory test.

1.2.4 Local jurisdictional requirements

The *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* sets out requirements in relation to the minimum network performance requirements that a planned power system of a TNSP must meet in order to satisfy the reliability limb of the regulatory test prescribed in the NER. Transend has obligations under Section 5 – minimum network performance standards

which form part of their planning criteria. These are discussed in Section 3.1.1 of this final report.

1.3 SCOPE

This final report sets out a proposal for a new small transmission network asset and new large distribution network assets that will jointly address the existing and emerging constraints within the electricity networks in the Kingston area. This final report provides information necessary to satisfy the requirements of clauses 5.6.2 and 5.6.6A of the NER.

The remainder of this final report is divided into six sections as follows:

Overview of the Kingston area	This section provides a general description of the Kingston area and its development as background to the development scenarios and the electricity demand forecast. The existing electricity supply arrangements are also presented in this section.
Network limitations	Details of the existing and emerging supply limitations in the Kingston area.
Alternative options	The non-network and network alternative options that have been identified are discussed in this section. The alternative options are compared and ranked, and a sensitivity analysis is presented.
Financial analysis	This section presents the financial analysis of the options identified and a net present value of all works concerned with each.
Conclusions and draft recommendations	This section presents concluding points along with a recommendation to implement the preferred option.
Dispute notices	Dispute process and contact details for lodging dispute notices is provided in this section.

1.4 REFERENCES

- Aurora Energy 2008, Distribution Network Connection Ten-Year Consumption and Maximum Demand Forecast, Utility Engineering Services, Hobart TAS.
- Aurora Energy 2008, 2008 Annual Planning Report, Aurora Energy, Hobart, TAS.
- Australian Energy Market Commission 2009, National Electricity Rules (version 29), AEMC, Sydney, NSW.
- Australian Energy Regulator 2007, Final Decision Regulatory Test Version 3 & Application Guidelines, AER, Sydney, NSW.
- State of Tasmania 2007, *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*, Tasmanian Attorney-General's Office, Hobart, TAS.
- Transend 2008, 2008 Annual Planning Report, Transend, Hobart TAS.
- ABS 2006, Australian Bureau of Statistics 2006.
- ABS 2008, Australian Bureau of Statistics 2008

2 OVERVIEW OF THE KINGSTON AREA

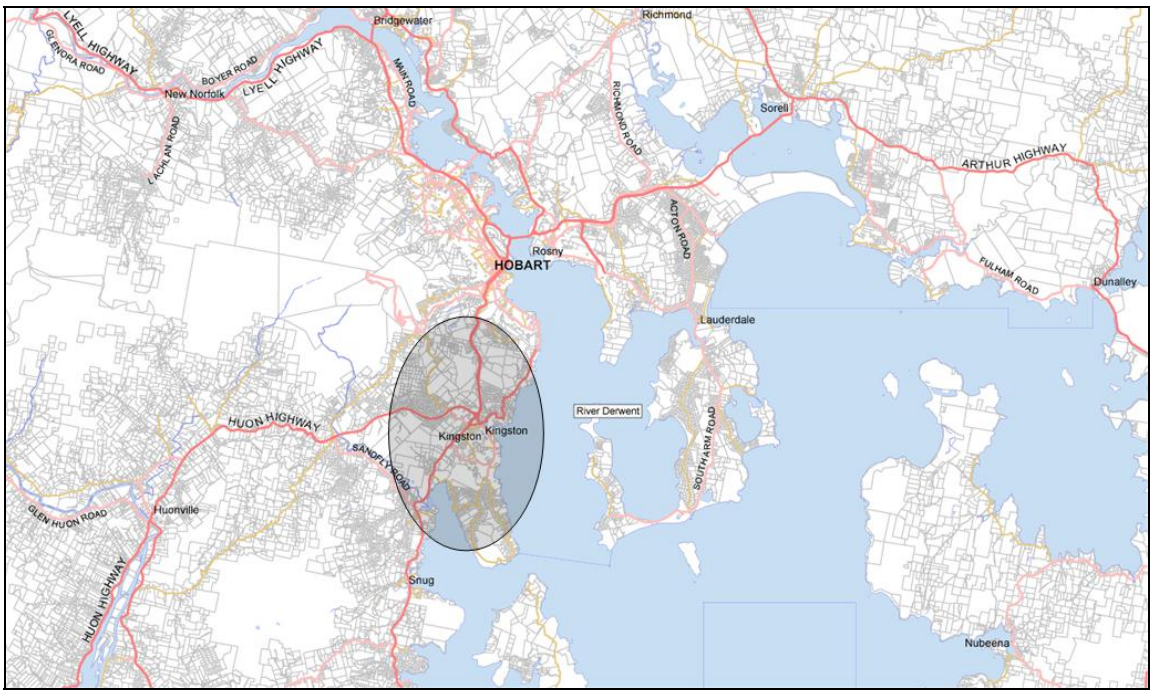
This section provides an overview of the Kingston area, the anticipated developments within this area, as well as the area development scenarios considered. This information serves as background

to the presentation of the area load forecast which has been used as the basis for studies of the electricity networks. An overview of the existing electricity supply arrangements within the area is also presented, and this section concludes with a discussion of the existing and emerging supply limitations that have been identified.

For the purposes of this final report, the Kingston area is considered the area south of Hobart that extends from Mount Nelson to Margate, including Kingston, Blackmans Bay, Margate and Electrona.

This area can be predominately characterised as residential, rural residential and rural, centred around the large business district at Kingston with some smaller light industrial and commercial centres distributed throughout the area. Figure 2-1 presents a map of the Kingston area.

Figure 2-1 – Kingston area



2.1 ECONOMIC DEVELOPMENT IN THE KINGSTON AREA

Central to the area is the Kingborough municipality with an estimated population of 32,800 with an annual growth rate of 2.0 per cent (ABS 2008). The number of businesses in the area by 2031 is forecast to increase by approximately 1.0 per cent per annum (ABS 2006).

Close proximity and good access to the city of Hobart presents a strong growth driver for residential subdivision development along with ancillary commercial services.

Electricity demand in the area continues to increase due to a steady population growth and local government focus on commercial development in specific areas. This is reflected in the sustained load growth rate of the Kingston area which is about 3 per cent per annum compared with the Tasmanian state average 1.5 per cent.

2.2 DEVELOPMENT SCENARIOS AND DEMAND FORECASTS

The demand forecast for Kingston and Electrona substations is taken from the '*2008 Distribution Network Connection Ten-Year Consumption and Maximum Demand Forecast*' (2008 UES load growth forecast) prepared by Utility Engineering Solutions. Transend and Aurora consider that the medium (expected) winter demand forecast is appropriate for planning in this area, given the

impacts of the global economic conditions and the proposed CPRS that have been factored into the forecast.

Three area development scenarios were considered in undertaking joint planning for this area. These scenarios considered high growth, medium or expected growth, and low growth possibilities.

Under each of the three scenarios, area growth in electricity demand is driven fundamentally by state population growth and growth in the number of households (state-wide).

This growth is underpinned by the economic conditions that are taken into account through forecasts of key economic indicators. In developing the demand forecasts, three different growth rates of electricity demand were developed based on the three area growth scenarios considered.

From the Ten-Year Consumption and Maximum Demand forecast, the average growth in demand under a medium growth scenario for the Kingston area is 3 per cent per annum.

The high growth scenario represents an annual growth rate 1.3 per cent greater than the expected area growth rate. The medium growth scenario represents the area's expected growth, and as such there is an equal probability (50 per cent probability) that the actual area demand will fall above or below this forecast. The low growth scenario represents an annual growth rate 0.7 per cent less than the expected area growth rate.

In addition to general underlying growth, significant developments (point loads) have been identified and considered on a case-by-case basis using specific information gathered from developers working in the area. These significant developments (point loads) have been added separately to the relevant underlying growth forecasts.

Aurora has produced summer and winter demand forecasts for each development scenario, and for each substation in the Kingston area. Winter demand forecasts are however the most relevant for network planning in this area, due to Tasmania's climatic conditions and the area's largely residential and rural residential land use.

The 2008 winter demand forecasts for the medium, high and low growth scenarios are presented in Table 2-1, Table 2-2 and Table 2-3 respectively. These forecasts have been used as the basis for the network studies for the Kingston area.

The medium growth rate relates to a 50 per cent Probability of Exceedence (PoE), where in the short term this is the most likely load based on historical demands and average weather patterns. The forecasts do not factor in a one in ten year adverse temperature incursion.

Larger loads that have been committed for connection to the distribution network, and that have not been included in the general load forecast, have been included in the tables as point loads.

Where practical, load is transferred between substations in the area via the distribution network to optimise the capacity of the distribution and transmission networks by redirecting load to less loaded substations. A detailed analysis of the transfer capability of the distribution network has been undertaken and a works program has been developed to maximise load transfer capability as far as practical.

Load transfer capabilities are discussed further in Section 3.

Table 2-1 – Medium (Expected) growth winter demand forecast (MVA)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kingston Substation (firm 35 MVA, cyclic 42 MVA)																
Forecast	42.1	43.5	44.9	48.5	49.9	51.4	52.9	54.4	55.9	57.3	58.8	60.4	62	63.7	65.4	67.2
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	42.1	43.5	46.9	48.5	49.9	51.4	52.9	54.4	55.9	57.3	58.8	60.4	62	63.7	65.4	67.2
Electrona Substation (firm 25 MVA, cyclic 30 MVA)																
Forecast	13.7	14.2	14.7	15.4	15.6	16.1	16.5	17	17.5	17.9	18.4	18.9	19.4	19.9	20.5	21
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	13.7	14.2	14.7	15.4	15.6	16.1	16.5	17	17.5	17.9	18.4	18.9	19.4	19.9	20.5	21
Kingston area total (firm 60 MVA, cyclic 72 MVA)																
Total	55.8	57.7	61.6	62.9	65.5	67.5	69.4	71.4	73.4	75.2	77.2	79.3	81.4	83.6	85.9	88.2
Growth (%)	3.4	7.0	3.5	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.8	2.8	2.8	2.8	2.8	2.8

Source: Forecast load based on the 2008 UES load growth forecast.

Table 2-2 – High growth winter demand forecast (MVA)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kingston Substation (firm 35 MVA, cyclic 42 MVA)																
Forecast	42.6	44.6	46.7	50.9	53.1	55.4	57.7	60.1	62.5	64.9	67.4	70.1	72.9	75.9	78.9	82.1
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	42.6	44.6	48.7	50.9	53.1	55.4	57.7	60.1	62.5	64.9	67.4	70.1	72.9	75.9	78.9	82.1
Electrona Substation (firm 25 MVA, cyclic 30 MVA)																
Forecast	13.9	14.5	15.2	15.9	16.6	17.3	18	18.8	19.5	20.3	21.1	21.9	22.8	23.7	24.7	25.7
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	13.9	14.5	15.2	15.9	16.6	17.3	18	18.8	19.5	20.3	21.1	21.9	22.8	23.7	24.7	25.7
Kingston area total (firm 60 MVA, cyclic 72 MVA)																
Total	56.5	59.1	63.9	66.8	69.7	72.7	75.7	78.9	82	85.2	88.5	92	95.7	99.6	103.6	107.8
Growth (%)	4.8	8.4	4.9	4.6	4.5	4.4	4.3	4.2	4.1	4.0	4.2	4.2	4.2	4.2	4.2	4.2

Source: Forecast load based on the 2008 UES load growth forecast.

Table 2-3 – Low growth winter demand forecast (MVA)

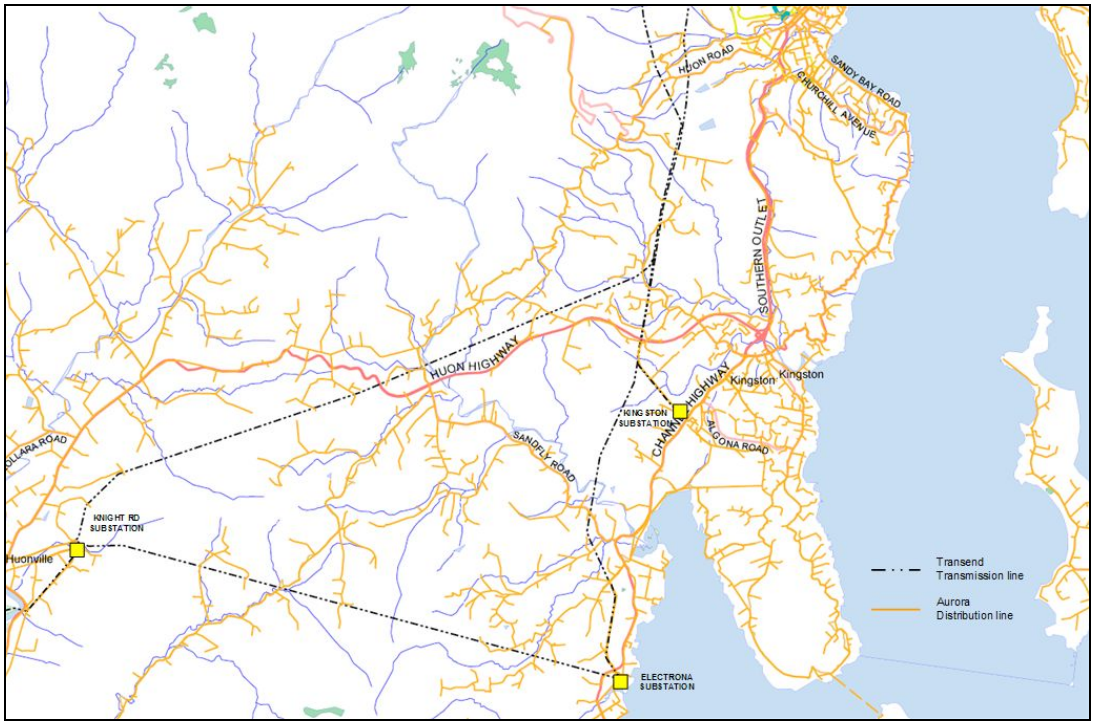
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kingston Substation (firm 35 MVA, cyclic 42 MVA)																
Forecast	41.8	42.9	44	47.2	48.3	49.4	50.5	51.6	52.6	53.6	54.6	55.7	56.8	57.9	59.1	60.3
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	41.8	42.9	46	47.2	48.3	49.4	50.5	51.6	52.6	53.6	54.6	55.7	56.8	57.9	59.1	60.3
Electrona Substation (firm 25 MVA, cyclic 30 MVA)																
Forecast	13.6	14	14.4	14.7	15.1	15.4	15.8	16.1	16.4	16.8	17.1	17.4	17.8	18.1	18.5	18.9
Transferred	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point loads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	13.6	14	14.4	14.7	15.1	15.4	15.8	16.1	16.4	16.8	17.1	17.4	17.8	18.1	18.5	18.9
Kingston area total (firm 60 MVA, cyclic 72 MVA)																
Total	55.4	56.9	60.4	61.9	63.4	64.8	66.3	67.7	69	70.4	71.7	73.1	74.6	76	77.6	79.2
Growth (%)	2.7	6.3	2.7	2.4	2.4	2.3	2.1	2.1	1.9	1.9	2.1	2.1	2.1	2.1	2.1	2.1

Source: Forecast load based on the 2008 UES load growth forecast.

2.3 EXISTING SUPPLY ARRANGEMENTS

Figure 2-2 presents the geographic arrangement of the transmission and distribution networks within the Kingston area. A simplified single line diagram of the transmission network is also presented in Figure 2-3.

Figure 2-2 – Transmission network geographic arrangement

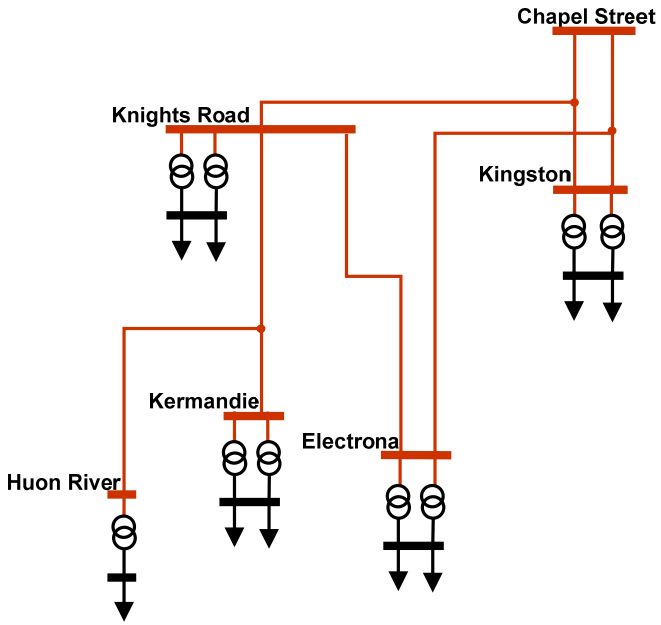


The Kingston area is supplied from the 110 kV network at Chapel Street Substation via Kingston Substation and to a lesser extent, Electrona Substation. The other substation in the area, Knights Road, has little impact on the Kingston area load due to its geographical location and minimal load transfer capabilities. The entire load in the Kingston area is connected to the distribution network at either 11 kV or low voltage 400/230 V.

Kingston Substation, which is centrally located in the Kingston area, has two 110/11 kV, 35 MVA transformers with 12 outgoing distribution feeders. The substation has a firm rating of 35 MVA, with a cyclic rating of 42 MVA.

Electrona Substation, located to the south-west of the Kingston area, has two 110/11 kV, 25 MVA transformers with eight outgoing 11 kV distribution feeders. Electrona Substation has a firm rating of 25 MVA, with a cyclic rating of 30 MVA.

Figure 2-3 – Kingston area transmission network single line diagram



Kingston and Electrona substations, as well as all interconnecting 110 kV transmission lines are owned and operated by Transend. While the 11 kV distribution network is interconnected, as shown in Figure 2-2, the ability to transfer load between substations is limited due to the capability of the existing distribution feeders and topography. Distribution network interconnection is also limited due to the topology of the area.

3 NETWORK LIMITATIONS

Transend and Aurora have conducted studies of the transmission and distribution networks in the Kingston area over the 25 year planning period commencing in 2010 to 2035. These studies are based on the area development scenarios and demand forecasts presented in Section 2.2, and the existing supply arrangements presented in Section 2.3.

Transend's transmission network in the Kingston area has existing and emerging supply limitations. Similarly, Aurora's distribution network also has existing and emerging supply limitations.

The nature and timing of these supply limitations is different for the transmission and distribution

networks, and also varies under the demand forecast for each of the area development scenarios. Consequently, this section firstly considers the transmission network supply limitations under the high, medium and low growth scenarios. The distribution network supply limitations are then considered under each of the scenarios.

3.1 TRANSMISSION SYSTEM SUPPLY ISSUES

3.1.1 Substation loads and project drivers

The following sections outline the potential load at risk in the event of a single transformer failure at either Kingston or Electrona substations.

Kingston Substation

Table 3-1, Table 3-2 and Table 3-3 present the medium, high and low load forecasts respectively for Kingston Substation. The three tables forecast the amount of load at risk at Kingston Substation during a transformer contingency where emergency 11 kV load transfers have been performed. . It shows that, for the medium demand forecast, load will need to be shed from 2013 in the event of a single transformer failure.

Table 3-1 – Kingston Substation demand medium growth forecast and load at risk (MVA)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum demand (MVA)	42.1	43.5	46.9	48.5	49.9	51.4	52.9	54.4	55.9	57.3	58.8
Firm rating (MVA)	35 (Cyclic 42) MVA										
Load at risk (MVA)	0.1	1.5	4.9	6.5	7.9	9.4	10.9	12.4	13.9	15.3	16.8
Contingent event transfer capability (MVA)	3.2	2.4	6.9	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7
Load at risk that may have to be shed (MVA)	0	0	0	0	**1.3**	**2.9**	**4.6**	**6.2**	**7.9**	**9.4**	**11.1**

Table 3-2 – Kingston Substation demand high growth forecast and load at risk (MVA)

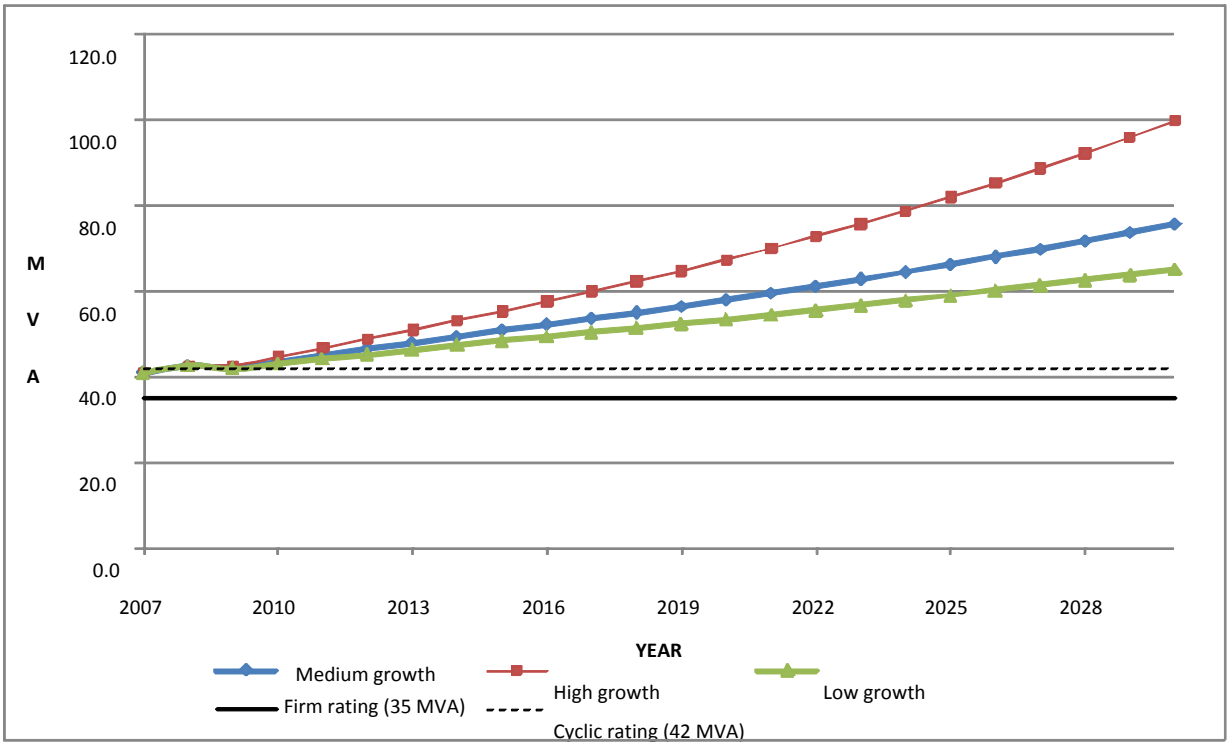
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum demand (MVA)	42.6	44.6	48.7	50.9	53.1	55.4	57.7	60.1	62.5	64.9	67.4
Firm rating (MVA)	35 (Cyclic 42) MVA										
Load at risk (MVA)	0.6	2.6	4.7	8.9	11.1	13.4	15.7	18.1	20.5	22.9	25.4
Contingent event transfer capability (MVA)	3.2	2.4	6.9	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7
Load at risk that may have to be shed (MVA)	0	0	0	**2.1**	**4.5**	**6.9**	**9.4**	**11.9**	**14.5**	**17.0**	**19.7**

Table 3-3 – Kingston Substation demand low growth forecast and load at risk (MVA)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum demand (MVA)	41.8	42.9	44	47.2	48.3	49.4	50.5	51.6	52.6	53.6	54.6
Firm rating (MVA)	35 (Cyclic 42) MVA										
Load at risk (MVA)	0	0.9	2.0	5.2	6.3	7.4	8.5	9.6	10.6	11.6	12.6
Contingent event transfer capability (MVA)	3.2	2.4	6.9	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7
Load at risk that may have to be shed (MVA)	0	0	0	0	0	**0.9**	**2.2**	**3.4**	**4.6**	**5.7**	**6.9**

Figure 3-1 presents a graph of the historical actual demand from 2007, as well as the high, medium and low forecast winter demand against the available capacity at Kingston Substation.

Figure 3-1 – Comparison of demand forecast to capacity at Kingston Substation



Electrona

The medium winter demand forecast is presented in Table 2-1.

The Electrona Substation winter demand in 2009 is 14 MVA and the firm capacity of the substation is 25 MVA. The substation has sufficient capacity to supply the forecast load over the planning period.

3.1.2 NER compliance

Clause S5.1.2.1 of the NER states that *'Network Service Providers must plan, design, maintain and operate their transmission networks and distribution networks to allow the transfer of power from generating units to Customers with all facilities or equipment associated with the power system in service and may be required by a Registered Participant under a connection agreement to continue to allow the transfer of power with certain facilities or plant associated with the power system out of service'*. The requirements of the above clause have been taken into consideration regarding this project.

3.1.3 ESI Regulations

The *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* are the local jurisdictional regulations under which the Tasmanian transmission system must be planned. These form the basis of Transend's planning criteria. The existing transmission network in the Kingston area is not sufficient to ensure that requirements under the ESI regulations are met throughout the planning period.

The following issues leave Transend at risk of non-compliance with the ESI regulations over the forthcoming planning period:

- **Clause 5(1)(a)(i)-no more than 25 MW of load is to be capable of being interrupted by a credible contingency event;**
    - The load at Kingston Substation reached 42 MVA in 2008 putting the load at risk by a credible contingency event greater than 25 MW. Although the total load connected to Kingston Substation is within the cyclic rating of the transformers, the load connected to the 11 kV busbars is not evenly balanced. This results in the load connected to one 11 kV busbar exceeding 25 MW on occasions. This issue is currently managed by opening the 11 kV bus section circuit breaker to ensure that the remaining transformer is not overloaded in the event of a transformer failure. Aurora has implemented load transfers between existing feeders to rectify this imbalance of load as far as practicable as a short term solution.
- **Clause 5(1)(a)(iv)-the unserved energy to load that is interrupted consequent on damage to a network element resulting from a credible contingency event is not to be capable of exceeding 300 MWh at any time;**
    - The load connected to Kingston Substation is forecast under a medium load growth scenario to be such that a loss of one 110/11 kV transformer will result in excess of 300 MWh of unserved energy in 2016.

Any transmission network augmentations that arise out of the inability of the current network to meet these requirements are reliability augmentations in accordance with the definition in Chapter 10 of the NER.

3.2 DISTRIBUTION NETWORK SUPPLY ISSUES

Limitations of the current distribution network are related to load growth. The capacity of Kingston Substation needs to be increased or load transferred to a new supply point to free up capacity at Kingston Substation.

Kingston

Kingston Substation currently operates with a total of 12 distribution 11 kV feeders. Four of these 11 kV feeders were overloaded during winter 2008. The eight other feeders were also heavily utilised during peak loading periods. As noted in Table 3-1, the distribution network between Kingston and Electrona substations is constrained to under 7 MVA of emergency transfer capability beyond 2012. Due to the geographical spread of load in the Kingston area, voltage issues have also arisen at Kingston Substation which is being handled in the short term via voltage regulators and feeder augmentations.

Kingston Substation predominantly supplies light commercial, urban and rural loads. Under the distribution planning criteria and the Tasmanian Reliability Performance Standards, the maximum total time without electricity in a year for high density commercial areas is 120 minutes, and for urban and regional centres is 240 minutes.

Electrona

Electrona Substation currently operates with a total of eight distribution 11 kV feeders.

Electrona Substation predominantly supplies urban and rural loads. Under the distribution planning criteria and the Tasmanian Reliability Performance Standards, the maximum total time without electricity in a year for urban and regional centres is 240 minutes.

3.2.1 Transfer capability

During 2008, Kingston Substation was operating above its cyclic rating during the winter peak

load. In the event of the failure of a single transformer at Kingston Substation, the existing 11 kV distribution network did not have the capability to transfer contingent load to Electrona Substation.

A detailed system analysis of the transfer capability of the distribution network in the Kingston area has been used to develop a comprehensive works program to address load transfer constraints.

The maximum transfer capability of the individual components of the existing distribution feeder network, after the distribution feeder works have been undertaken, is shown in Table 3-4.

Table 3-4 – Inter-substation transfer capability

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Kingston to Electrona (MVA)	3.2	2.4	6.9	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7

As noted in Table 3-1, under a medium load growth scenario, for winter 2013, a contingent event, such as a transformer failure at Kingston Substation, could result in load up to 1.3 MVA being shed (that is, after the emergency transfer of load to Electrona Substation). The amount of load shed could be as high as 2.1 MVA under a high load growth scenario.

The estimated cost to optimise the load transfer capability between Kingston and Electrona substations is $2.97 million. Once completed, there are no cost-effective ways of further increasing the load transfer capacity between the two substations.

4 ALTERNATIVE OPTIONS

This section outlines the alternative options that have been considered as practical solutions to address the existing and emerging supply limitations in the Kingston area as identified in Section 3. The feasibility of not undertaking any action (the ‘do nothing’ option) is first considered, then consideration is given to non-network options, and lastly the practical development network options are examined.

Analysis of options has been taken over a 25 year period (to 2035) to be consistent with plant life-cycle costs and to enable the evaluation of the option’s ability to address longer term limitations that would become evident, depending on the option being considered.

4.1 DO NOTHING

Currently, the maximum demand in the Kingston area exceeds the cyclic rating of a single transformer at Kingston Substation during the winter peak. The failure of one of the supply transformers during peak periods combined with an open 11 kV bus, an operational requirement when the connected load exceeds the cyclic ratings of the transformers, would result in the need to transfer load from Kingston Substation to Electrona Substation. This is an adequate solution to mitigate the risk of overloading the transformers at Kingston Substation until the load transfer capability to Electrona Substation becomes non-viable. After 2013, under the medium load growth scenario, it will not be practical for Aurora’s distribution network to transfer sufficient load to Electrona Substation in the event of a transformer failure. Hence augmentation of the Kingston area network will be required by winter 2013.

In addition, under the medium winter demand forecast for the Kingston area, current supply arrangements will be non-compliant with the planning criteria of both Aurora and Transend from 2013.

Therefore, Transend and Aurora must take action under their current obligations, and the do

nothing option was not considered further.

The following alternative options were considered as an application of the reliability limb of the regulatory test under the requirements of the NER.

4.2 NON-NETWORK ALTERNATIVE OPTIONS

This section considers a number of non-network alternative options to reduce demand on the networks in the Kingston area as a means to addressing the existing and emerging network limitations.

4.2.1 Demand side management and embedded generation

Demand Side Management (DSM) schemes have been successfully employed both nationally and internationally to reduce network demand. Similarly, embedded generation could offer an alternative to a network solution in the case of the Kingston area supply requirements. However, to be viable in this case, any DSM scheme or embedded generation scheme would need to provide a reduction of approximately 10.1 MVA off the peak winter demand forecast across the area by winter 2012, 11.6 MVA of peak winter demand by winter 2013[2], and offset an annual peak demand growth of approximately 3.0 per cent[3]. Such schemes could allow the deferral of the lowest cost practical network alternative option, which is valued at approximately $2.5 million per annum[4]. On average, over the first two years of deferral, this is equivalent to approximately $232 per kVA per annum of peak winter demand reduction.

While DSM schemes have been implemented elsewhere, these schemes typically involve the participation of the industrial and commercial sectors.

However, the Kingston area is mostly residential through to light industrial, and has few significant individual loads that can readily employ a DSM scheme. Consequently, demand aggregation would be necessary to achieve the required demand reduction. Such demand aggregation is likely to require the extensive rollout of smart metering[5] or load control technology, an appropriate tariff structure, and the active support of retailers to achieve the necessary load reduction in the required timeframe.

Embedded generation has been implemented at a number of sites within Tasmania, with proposals to implement further units.

Whilst these units do offer some peak load relief, none offer reliability levels adequate to provide network support. Consideration has also been given to the potential uptake of small scale photovoltaic systems; however even with an increase in the trend of uptake of such systems it is not sufficient to overcome the developing capacity problems in the area.

Transend and Aurora are not presently aware of any available DSM options, or embedded generation proposals in the Kingston area that would provide the necessary network support. Proponents of viable embedded generation or DSM schemes were encouraged to submit proposals in response to the application notice.

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2 To reduce the winter peak to 90 per cent of the transformer cyclic rating.

3 The demand growth in the Kingston area has historically averaged approximately 3.5 per cent.

4 Based on the deferral of substation and distribution costs of option 4, and using the regulatory WACC as the appropriate discount rate.

5 The adoption of smart metering is currently under consideration in Tasmania.

4.2.2 Other non-network alternative options

Fuel substitution can be an effective means of reducing electricity demand. This involves encouraging consumers to reduce their electricity demand by using an alternative fuel to (in part) meet their energy needs. In practice this could be achieved by the substitution of electric appliances with gas appliances; and particularly those appliances that drive peak residential demand such as those used for heating and cooking. For a fuel substitution scheme to be practical, it would need to achieve a winter peak demand reduction at least similar to that discussed in Section 4.2.1.

Transend and Aurora are not presently aware of any viable fuel substitution schemes that would address the load reduction initiatives within the required timeframe to enable deferral of a network solution. Any genuine proponents of viable fuel substitution schemes were encouraged to submit proposals in response to the previously published application notice.

4.2.3 Non-network alternative options conclusion

Transend and Aurora investigated a number of non-network alternative options to address the existing and emerging network limitations discussed in Section **Error! Reference source not found.**. Given that no submissions were received in response to the application notice, both Transend and Aurora are of the view that there are currently no practical non-network solutions available in the Kingston area. Network alternative options

4.3 NETWORK ALTERNATE OPTIONS

Through the joint planning process, Transend and Aurora have identified a number of technical and practical alternative network options to address the identified network limitations discussed in Section 3.

4.3.1 Option 1 – Increase the capacity of the existing 11 kV connection point at Kingston Substation

4.3.1.1 Description

This option comprises the installation of a third 110/11 kV 35 MVA transformer and associated switchgear at Kingston Substation to alleviate the already overloaded transformers. Further details of the works that would need to be undertaken by Transend and Aurora, together with the timing and estimated cost are summarised in Table 4-1. Consistent with the requirement to demonstrate the least cost option, Option 1 has been included as a credible option for purpose of analysis, but it is a technically deficient solution that would require the installation of a non-standard transformer.

Table 4-1 – Option 1 - Proposed transmission and distribution network augmentation costs

Component	Year	Proposed Works	Estimated cost ($million 08–09)
Transend	2011–12	Installation of a third 110/11 kV 35 MVA transformer at Kingston Substation, thereby increasing the firm capacity of the connection point to 70 MVA. Extension of the existing switchroom to cater for an extended 11 kV switchboard.	12.00

Component	Year	Proposed Works	Estimated cost ($million 08–09)
	2022–23	Establishment of a new connection point comprising two x 110/11 kV 60 MVA transformers, approximately 8 km from Kingston Substation, including approximately 3 km of 110 kV transmission line and 5 km of 110 kV cable.	43.90
		Total transmission capital cost	**55.90**
Aurora	2011–12	Two new 'express' 11 kV feeders from Kingston Substation to support the Taroona area, comprising approximately 15 km of underground cabling and two voltage regulators.	7.14
		Five additional 11 kV feeders to transfer load from five existing overloaded feeders, comprising approximately 17.6 km of underground cabling and 4.2 km of overhead line.	10.32
	2013–14	Three additional 11 kV feeders necessary to transfer load from three existing feeders, comprising approximately 11.0 km of underground cabling and 4.0 km of overhead line.	3.97
	2014–15	Two new 'express' 11 kV feeders from Kingston Substation to support the Blackmans Bay area comprising approximately 14.4 km of underground cabling and two voltage regulators.	5.07
	2015–16	Two new express 11 kV feeders from Kingston Substation to support the Margate area, comprising approximately 9.6 km of underground cabling and two voltage regulators.	4.76
	2022–23	An additional six 11 kV feeders from a future 110/11 kV connection point in the Kingston area from 2023 to 2025.	4.77
	2024–25	An additional six 11 kV feeders from a future 110/11 kV connection point in the Kingston area from 2023 to 2025.	3.97
	2027–28	Additional 11 kV feeders from a future 110/11 kV connection point in the Kingston area.	2.26
		Total distribution capital cost	**42.26**

Figure 4-1 presents the proposed configuration of the transmission network in the Kingston area while Figure 4-2 shows the proposed network geographic arrangement resulting from the works proposed under this option.

Figure 4-1 – Option 1 - Proposed single line diagram

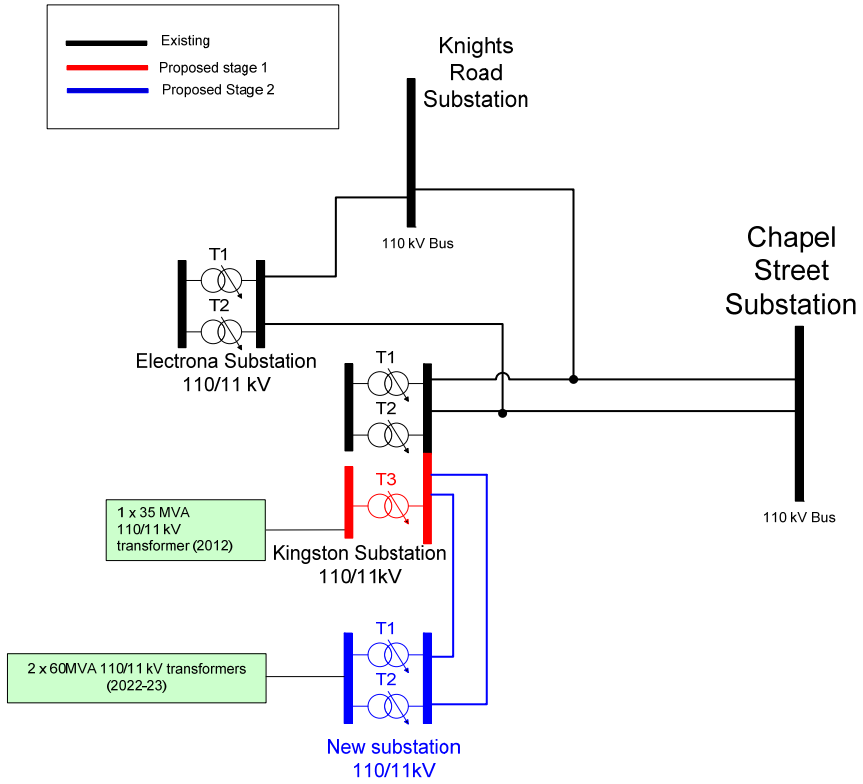
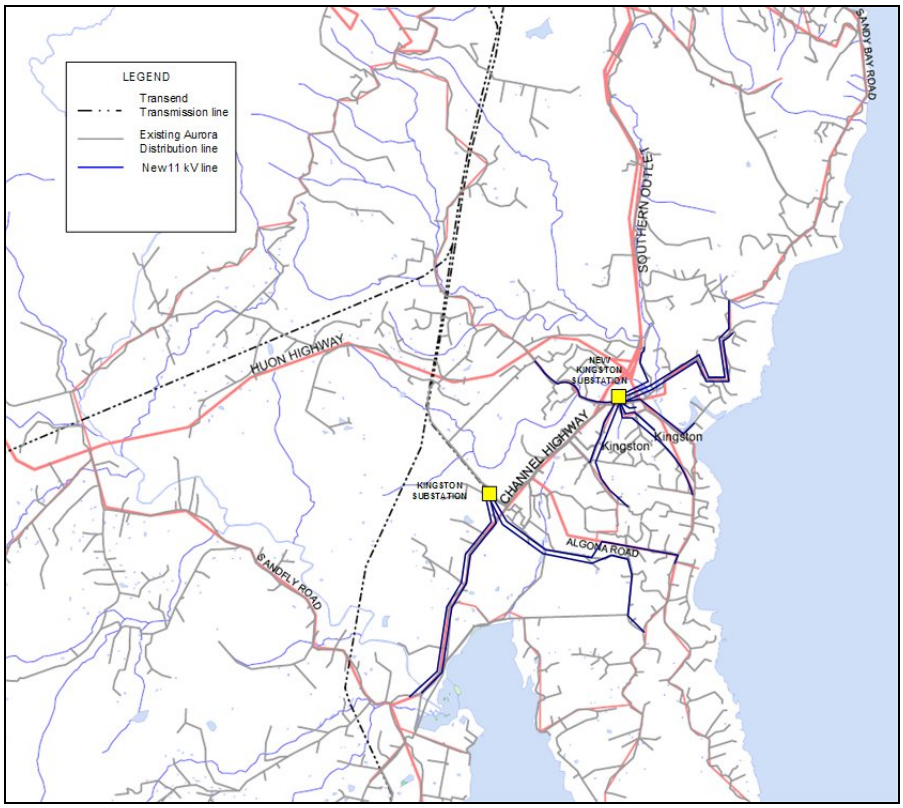


Figure 4-2 – Option 1 – Proposed network geographic arrangement



4.3.1.2 Timing

The construction of the Kingston Substation augmentation, and the associated 11 kV distribution feeders, would be undertaken to achieve commissioning by the winter of 2013.

4.3.1.3 Key outcomes

The medium demand forecast for Kingston and Electrona substations in comparison to the proposed capacity resulting from the implementation of this option are shown in Figure 4–3.

Figure 4-3 – Option 1 – Medium demand forecast vs proposed transmission capacity

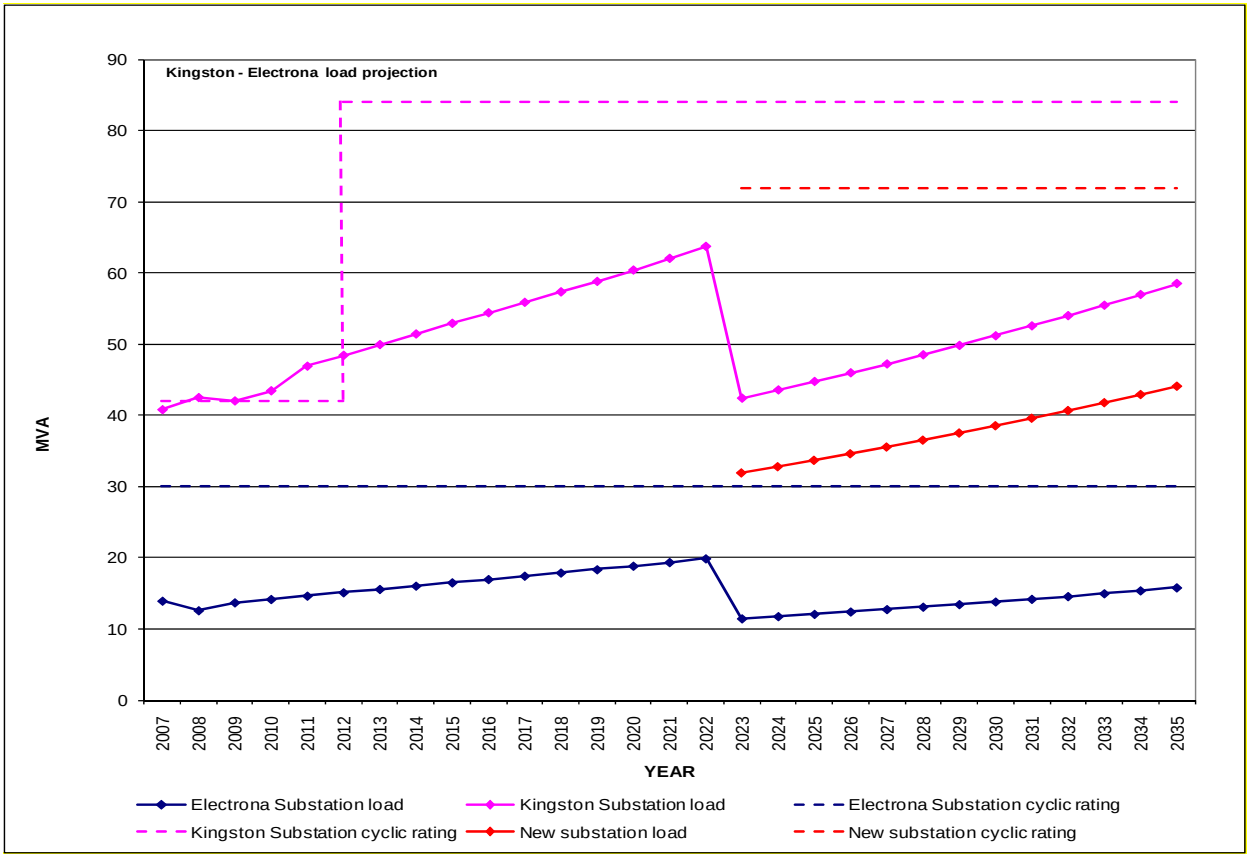


Figure 4-3 shows that under the medium demand forecast, the augmentation of Kingston Substation will address the transmission and distribution network supply limitations in the Kingston area as discussed in Section 3. The implementation of Option 1 would:

- enable Transend and Aurora to comply with the requirements of the NER;
- enable Transend to comply with requirements of Clause 5(1)(a)(i) and Clause 5(1)(a)(iv) of the ESI Regulations beyond 2013; and
- enable Aurora to transfer load from existing overloaded 11 kV feeders.

Current demand forecasts indicate that there will be further constraints in the Kingston area in the year 2023. Due to the continued load growth forecast for the area, Kingston Substation would again be overloaded at this time. Stage 2 for this option would require the establishment of a new 110/11 kV connection point in the Kingston area as described in Table 4-1 and presented in Figure 4-3.

4.3.2 Option 2 – Establish a new 110/11 kV connection point in the Kingston business area now

4.3.2.1 Description

This option involves the development by Transend of a new 110/11 kV connection point at the Kingston high school site or other suitable site close to the main load centre in the Kingston area.

The new substation would comprise two 110/11 kV 30/60 MVA transformers, and would relieve load from Kingston Substation.

Further details of the works to be undertaken by Transend and Aurora, together with timing and cost are summarised in Table 4-2.

Table 4-2 – Option 2 - Proposed transmission and distribution network augmentation costs

Component	Year	Proposed Works	Estimated cost ($million 08–09)
Transend	2011–12	Establishment of a new 110/11 kV substation in the Kingston area, comprising two 60 MVA 110/11 kV transformers that have a cyclic rating of 72 MVA. Installation of a new 110 kV transmission cable from Kingston Substation to the new substation.	37.1
		Total transmission capital cost	**37.1**
Aurora	2011–12	Two new express 11 kV feeders from Kingston Substation to support the Taroona area, comprising a approximately 7.6 km of underground cabling.	7.10
		Five additional 11 kV feeders to transfer load from the five existing overloaded feeders at Kingston Substation, comprising approximately 6.7 km of underground cabling and 2.3 km of overhead line.	10.32
	2013–14	Three additional 11 kV feeders necessary to transfer load from three existing feeders at Kingston Substation, comprising approximately 11.7 km of underground cabling and 4.0 km of overhead line.	3.97
	2014–15	Two new ‘express’ 11 kV feeders from Kingston Substation, to support the Blackmans Bay area comprising approximately 13.6 km of underground cabling and two voltage regulators.	5.07
	2015–16	Two new ‘express’ 11 kV feeders from Kingston Substation to support the Margate area, comprising approximately 15.6 km of underground cabling and two voltage regulators.	4.76

Component	Year	Proposed Works	Estimated cost ($million 08–09)
	2034–35	Additional of six 11 kV feeders from a future 110/11 kV connection point in 2035.	4.77
		Total distribution capital cost	**35.99**

Figure 4-4 presents the proposed configuration of the transmission network in the Kingston area while Figure 4-5 shows the proposed network geographic arrangement resulting from the works proposed under this option.

Figure 4-4 – Option 2 - Proposed single line diagram

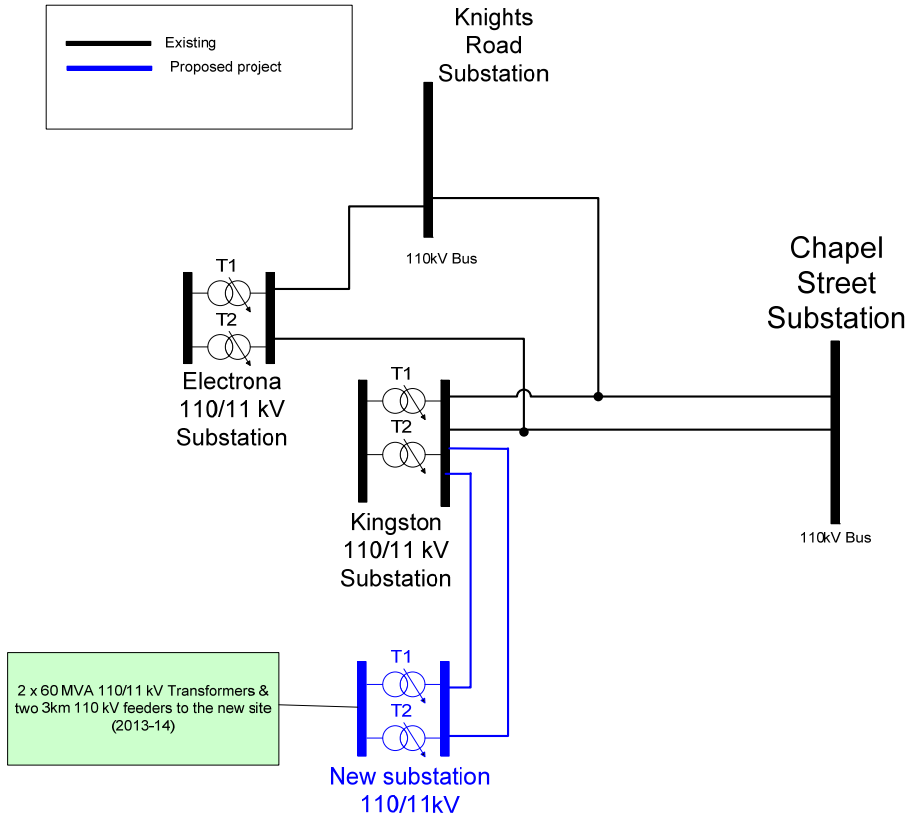
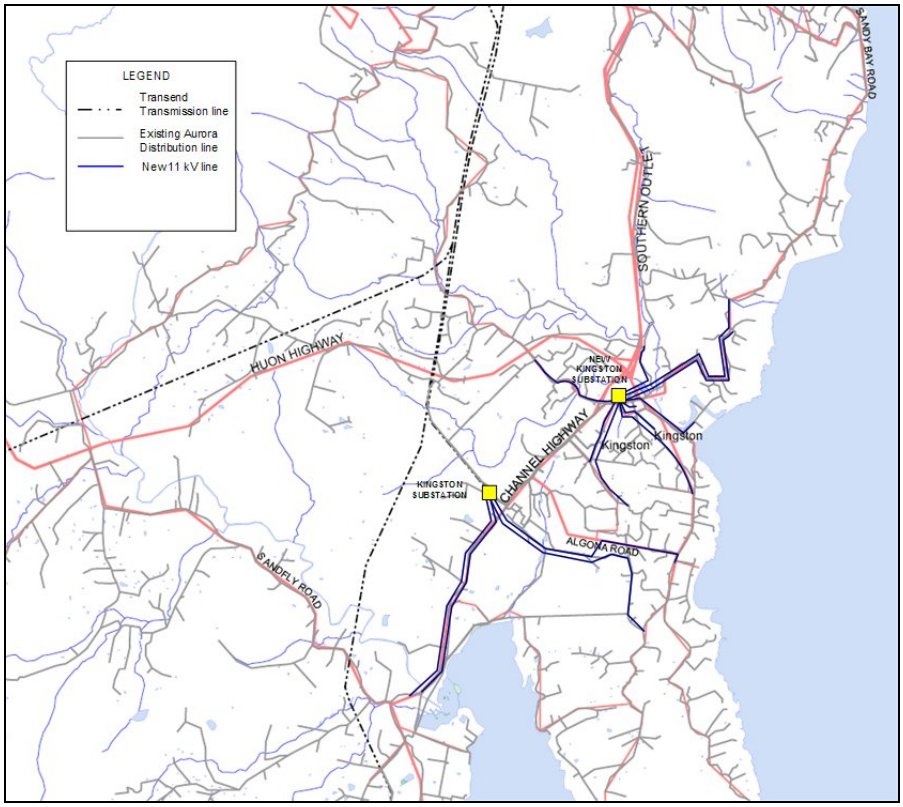


Figure 4-5 – Option 2 – Ultimate transmission network geographic arrangement



4.3.2.2 Timing

Construction of the new 110/11 kV connection point at the Kingston high school site would have to commence in 2013, with commissioning prior to the winter of 2014.

4.3.2.3 Key outcomes

The medium demand forecast for Kingston and Electrona substations in comparison to the proposed capacity resulting from the implementation of this option are shown in Figure 4–6.

Figure 4-6 – Option 2 – Medium demand forecast vs proposed transmission capacity

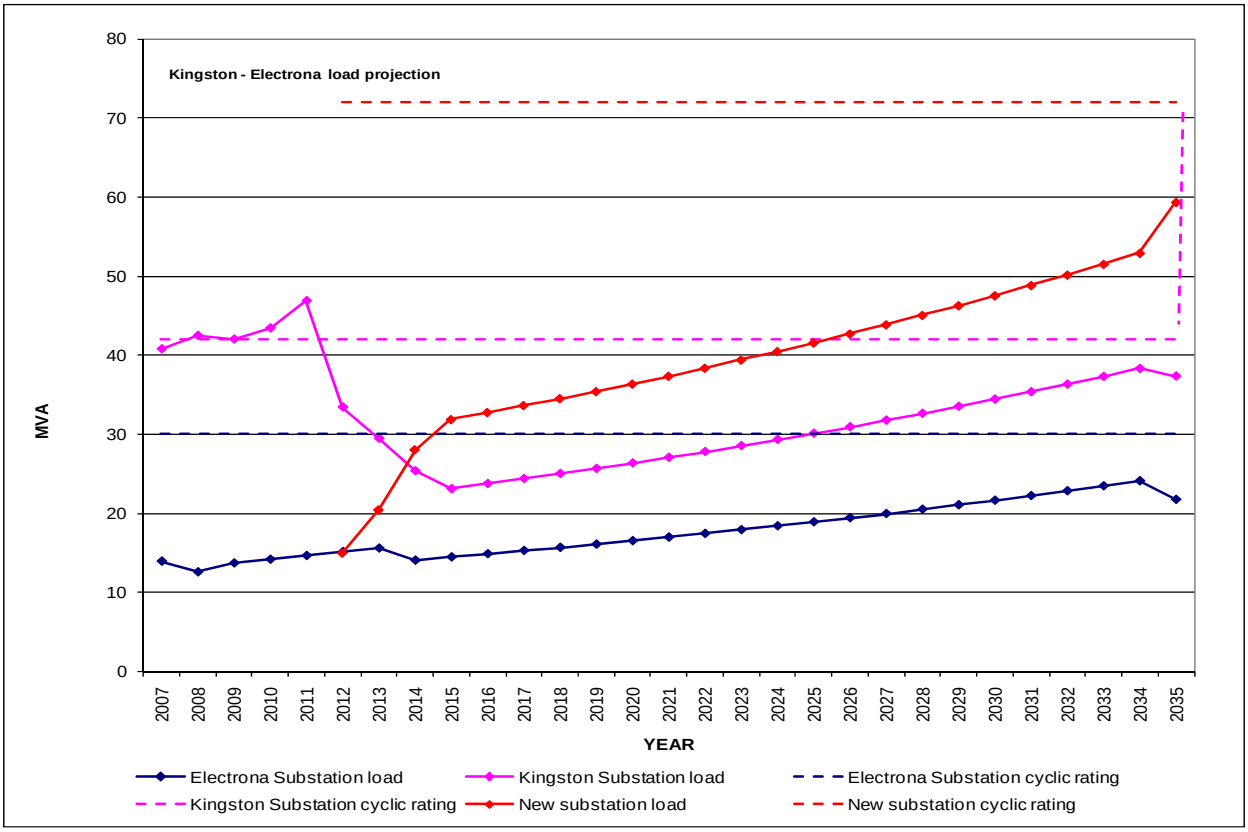


Figure 4-6 shows that under the medium demand forecast, the establishment of a new 11 kV connection point in the Kingston area will address the supply limitations discussed in Section 3. The implementation of Option 2 would:

- enable Transend and Aurora to comply with the requirements of the NER;
- enable Transend to comply with the requirements of Clause 5(1)(a)(i) and Clause 5(1)(a)(iv) of the ESI regulations beyond 2013;
- enable Aurora to transfer load from existing overloaded feeders; and
- provide greater capacity for inter-substation emergency and planned load transfers for future peak periods.

From land-use planning information that is currently available and following preliminary investigations, the site close to the present Kingston High School (which may be relocated) has been selected for this option because it is close to Kingston's major commercial centre. This option would require planning approval and infrastructure development which may impact on the timing of the project.

It is anticipated that further augmentation to address future constraints in the Kingston area will not be required until 2035 under this option.

4.3.3 Option 3 – Establish a new 110/33 kV connection point at a site near the existing Kingston Substation

4.3.3.1 Description

This option comprises the establishment of a new 33 kV connection point at a site near the existing Kingston Substation as well as the establishment of a zone substation in the same area. Further details of the works to be undertaken by Transend and Aurora, together with the timing and estimated cost are summarised in Table 4-3.

Table 4-3 – Option 3 - Proposed transmission and distribution network augmentation costs

Component	Year	Proposed Works	Estimated cost ($ million 08–09)
Transend	2011–12	Establishment of a new 110/33 kV connection point comprising two 60 MVA transformers that have a cyclic rating of 72 MVA adjacent to the existing Kingston Substation. Construction of a new 33 kV switchroom and installation of a new 33 kV switchboard. Extension of the existing 110 kV supply to connect the new 33 kV infrastructure.	23.99
	2031-32	Installation of a third 110/33 kV 60 MVA transformer at Kingston Substation	6.00
		Total transmission capital cost	**29.99**
Aurora	2011–12	Establishment of a new zone substation in the vicinity of Browns Road, comprising two 25 MVA 33/11kV transformers.	15.98
		Construction of two 33 kV subtransmission lines from the Kingston Substation 110/33 kV to the Browns Road Substation, comprising approximately 7.6 km of underground cabling.	
		Six new 11 kV feeders from Browns Road Zone Substation, comprising approximately 8.6 km of underground cabling and 6.5 km of overhead line.	
	2013–14	Three additional 11 kV feeders from Browns Road Zone Substation, comprising approximately 11.0 km of underground cabling and 6.8 km of overhead line.	3.55

Component	Year	Proposed Works	Estimated cost ($ million 08–09)
	2018–19	Establishment of a new zone substation in the Blackmans Bay area, comprising two 25 MVA 33/11kV transformers.	12.95
		Construction of two 33 kV subtransmission lines from Kingston Substation 110/33 kV to Blackmans Bay Zone Substation, comprising approximately 7.6 km of underground cabling.	
		Five new 11 kV feeders from Blackmans Bay Zone Substation, comprising approximately 18.8 km of underground cabling and 3.3 km of overhead line.	
	2023–24	Three additional 11 kV feeders from Blackmans Bay Zone Substation, comprising approximately 11.0 km of underground cabling and 1.2 km of overhead line.	4.18
	2024–25	Two 11 kV feeders from Blackmans Bay Zone Substation.	2.23
	2028–29	The establishment of a new zone substation, comprising two 25 MVA 33/11 kV transformers at a location suited to localised load growth.	14.30
		Two 33 kV subtransmission feeders from Kingston Substation 110/33 kV to the new zone substation.	
		Three 11 kV feeders to connect the new zone substation to the existing 11 kV distribution network.	
	2030–31	Three 11 kV feeders to connect the zone substation to the existing 11 kV distribution network.	4.40
	2032–33	Two 11 kV feeders to connect the zone substation to the existing 11 kV distribution network.	2.84
		Total distribution capital cost	**60.43**

Figure 4-7 presents the proposed configuration of the transmission network in the Kingston area while Figure 4-8 shows the proposed network geographic arrangement resulting from the works proposed under this option.

Figure 4-7 – Option 3 - Proposed single line diagram

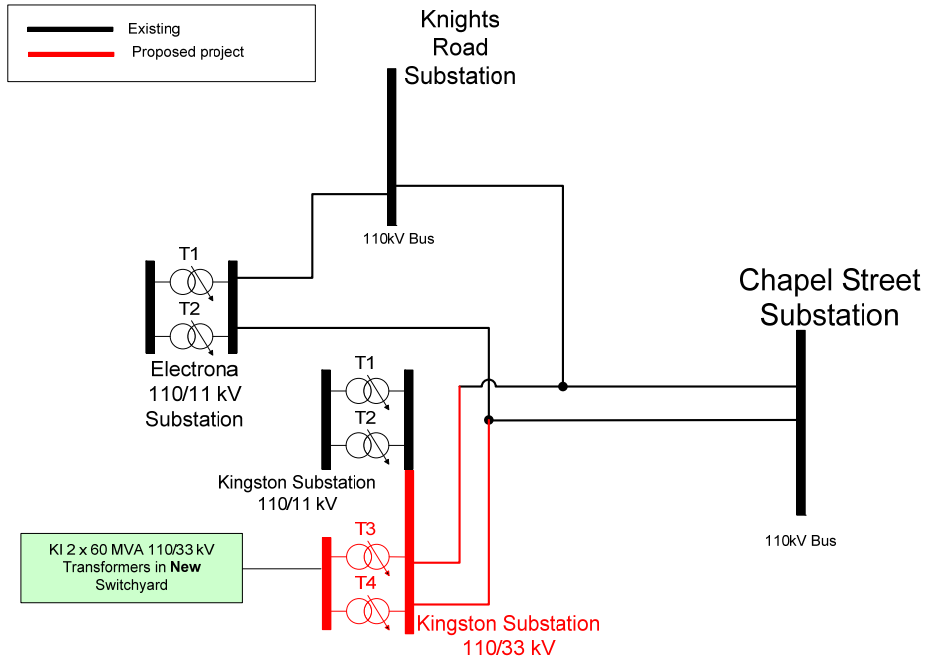
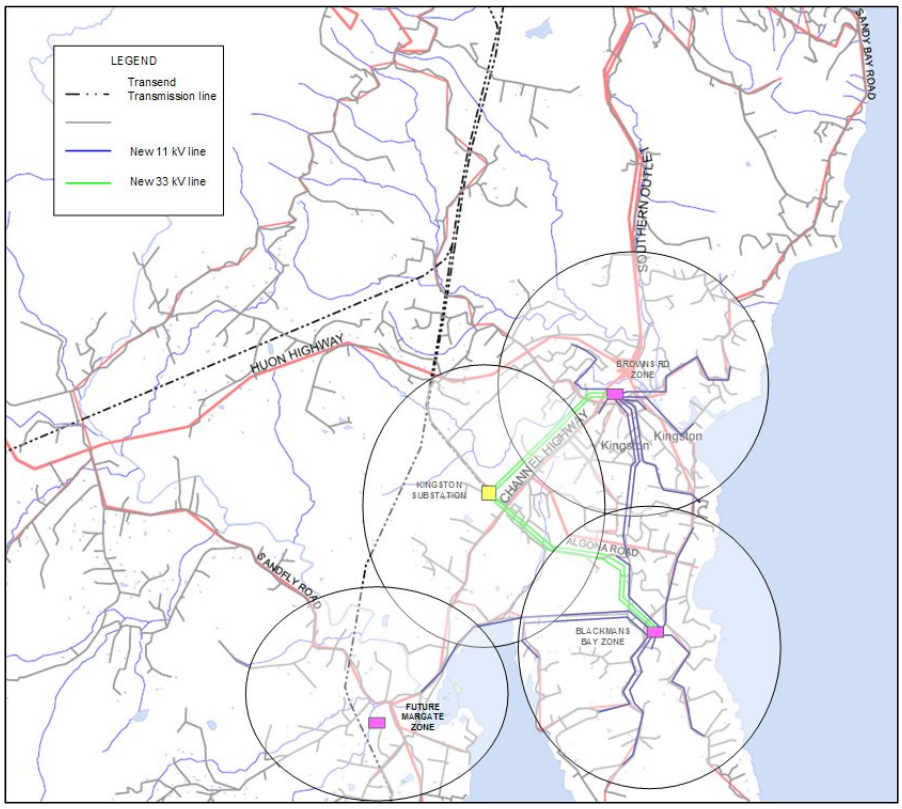


Figure 4-8 – Option 3 – Proposed Network Geographic Arrangement



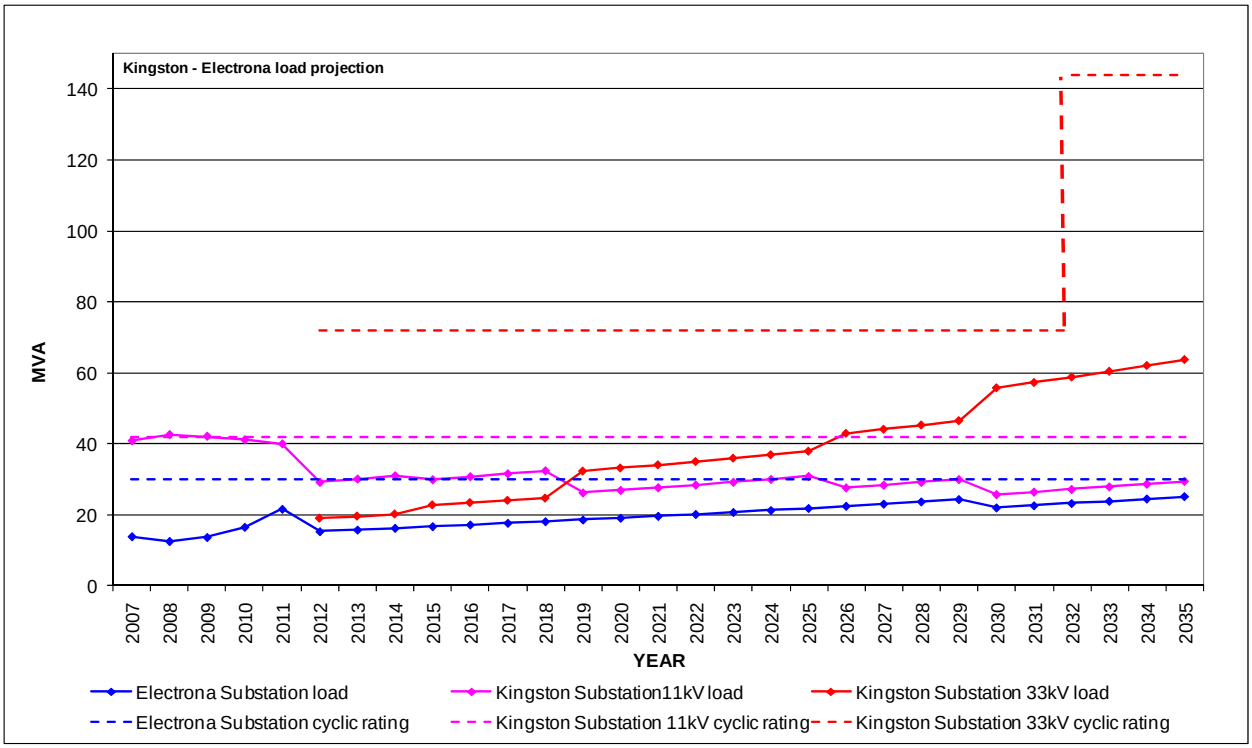
4.3.3.2 Timing

Construction work on the new 110/33 kV connection point at a site near Kingston Substation would commence in 2011, with commissioning prior to winter 2013.

4.3.3.3 Key outcomes

The medium demand forecast for Kingston and Electrona substations in comparison to the proposed capacity resulting from the implementation of this option are shown in Figure 4-9.

Figure 4-9 – Option 3 – Medium Demand Forecast Vs Proposed Transmission Capacity



As shown in Figure 4-9, the establishment of a 110/33 kV connection point at a site near the existing Kingston Substation would address the network limitations as discussed in Section 3. The implementation of Option 3 would:

- enable Transend and Aurora to comply with the requirements of the NER;
- enable Transend to comply with the requirements of Clause 5(1)(a)(i) and Clause 5(1)(a)(iv) of the ESI regulations beyond 2013;
- enable Aurora to transfer load from existing overloaded feeders; and
- provide greater capacity for inter-substation emergency and planned load transfers for future peak periods.

The establishment of a new 110/33 kV connection point and associated 33/11 kV zone substations in the Kingston area has the added benefit of allowing load to be supplied from strategically placed zone substations in the vicinity of large load growth areas, thereby providing improved operational flexibility and reduction of 11 kV feeder lengths which cause voltage supply issues.

It is forecast that further augmentation to address future constraints in the Kingston area would not be required until 2032 under this option. The second stage would require a third 110/33 kV 60 MVA transformer at Kingston Substation along with associated switchgear and a 110 kV busbar extension.

4.3.4 Option 4 – Establish a new 110/33 kV connection point at the existing Kingston Substation

4.3.4.1 Description

This option comprises the establishment of a new 33 kV connection point at the existing Kingston Substation. Further details of the works that would need to be undertaken by Transend and Aurora, together with the timing and estimated costs are summarised in Table 4-4.

Table 4-4 – Option 4 - Proposed transmission and distribution network augmentation costs

Component	Year	Proposed Works	Estimated cost ($ million 08–09)
Transend	2011–12	Establishment of a new 110/33 kV connection point at Kingston Substation comprising two 60 MVA transformers that have a cyclic rating of 72 MVA. Construction of a new 33 kV switchroom and installation of a new 33 kV switchboard. Extension of the existing 110 kV switchyard to connect the new 33 kV infrastructure.	17.45
	2031-32	Installation of a third 110/33 kV 60 MVA transformer at Kingston Substation	6.00
		Total transmission capital cost	**23.45**
Aurora	2011–12	Establishment of a new zone substation, comprising two 25 MVA 33/11kV transformers, in the vicinity of Browns Road.	15.98
		Construction of two 33 kV subtransmission lines from Kingston Substation to the Browns Road Substation, comprising approximately 7.6 km of underground cabling.	
		Six new 11 kV feeders from Browns Road Zone Substation, comprising approximately 8.6 km of underground cabling and 6.5 km of overhead line.	

Component	Year	Proposed Works	Estimated cost ($ million 08–09)
	2013–14	Three additional 11 kV feeders out from Browns Road Zone Substation, comprising approximately 11.0 km of underground cabling and 6.8 km of overhead line.	3.55
	2018–19	Establishment of a new zone substation, comprising two 25 MVA 33/11kV transformers, in the Blackmans Bay area.	12.95
		Construction of two 33 kV subtransmission lines from Kingston Substation to the Blackmans Bay Substation, comprising approximately 7.6 km of underground cabling.	
		Five new 11 kV feeders from Blackmans Bay Zone Substation, comprising approximately 18.8 km of underground cabling and 3.3 km of overhead line.	
	2023–24	Three additional 11 kV feeders out of the Blackmans Bay Zone Substation, comprising 11.0 km of underground cabling and 1.2 km of overhead line.	4.18
	2024–25	Two 11 kV feeders from Blackmans Bay Zone Substation.	2.23
	2028–29	A new zone substation, comprised of two 25 MVA 33/11kV transformers at a location suited to localised load growth, by winter 2029.	14.30
		Two 33 kV subtransmission feeders from Kingston Substation to the new zone substation.	
		Three 11 kV feeders to connect the zone substation to the existing 11 kV distribution network.	
	2030–31	Three 11 kV feeders to connect the zone substation to the existing 11 kV distribution network.	4.40
	2032–33	Two 11 kV feeders to connect the zone substation to the existing 11 kV distribution network.	2.84
		Total distribution capital cost	**60.43**

Figure 4-10 presents the proposed configuration of the transmission network in the Kingston area while Figure 4-11 shows the proposed network geographic arrangement resulting from the works proposed under this option.

Figure 4-10 – Option 4 - Proposed Single Line Diagram

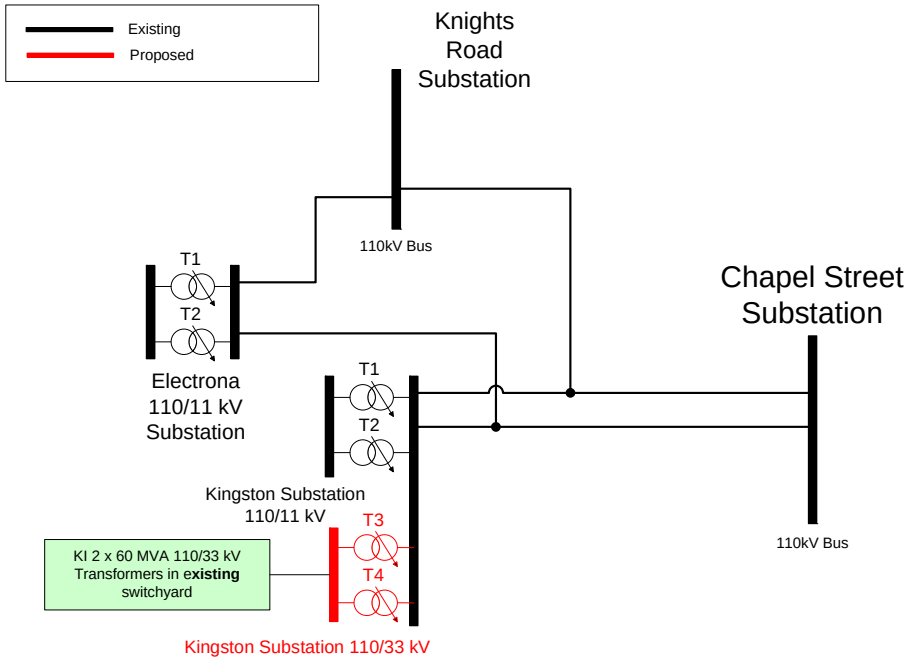
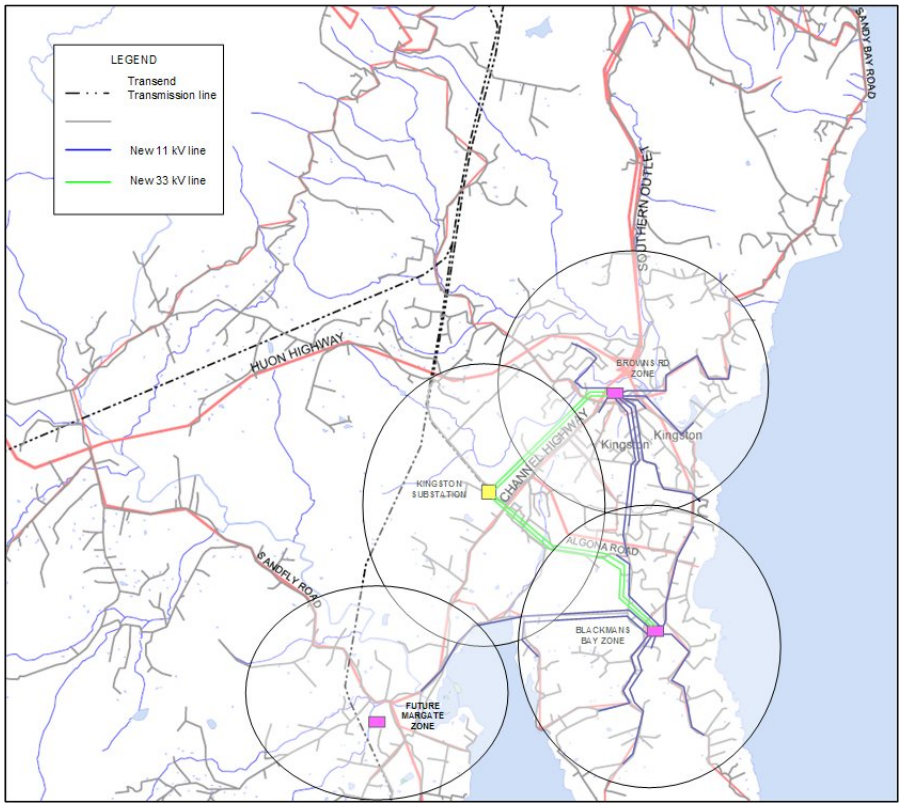


Figure 4-11 – Option 4 – Ultimate transmission network geographic arrangement



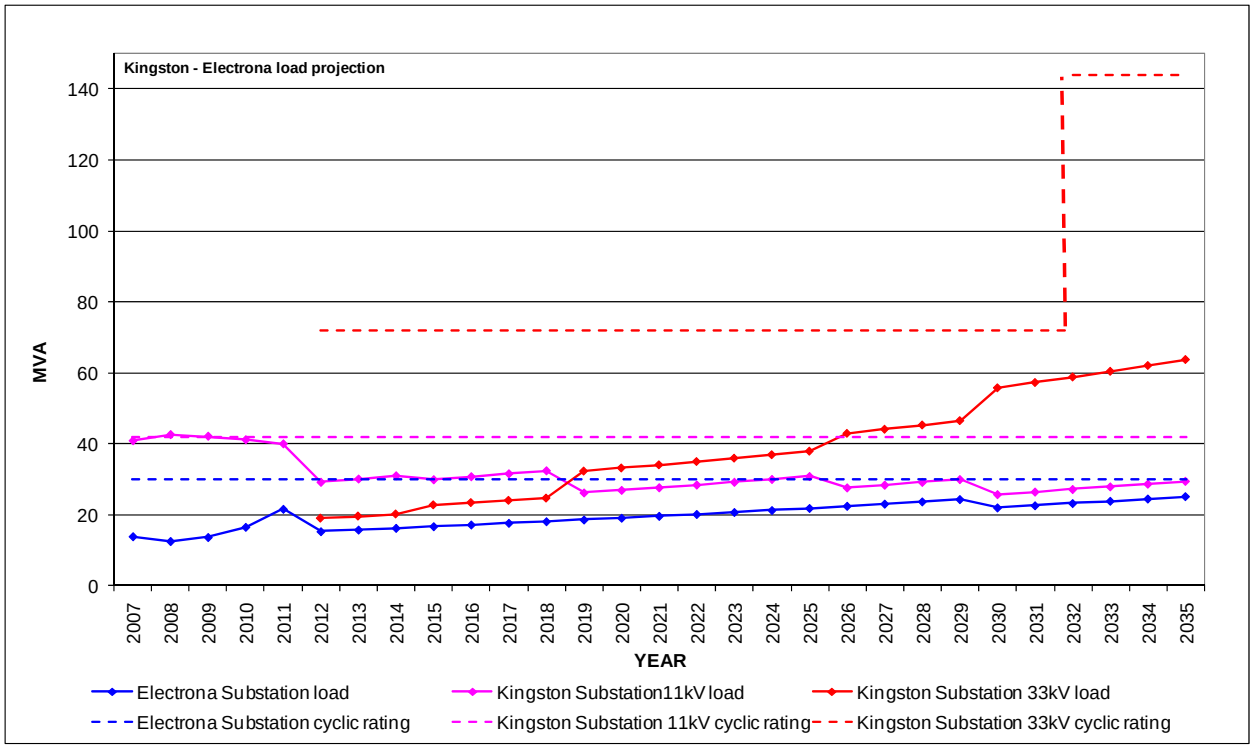
4.3.4.2 Timing

Construction work on the new 110/33 kV connection point at Kingston Substation would commence in 2011, with commissioning prior to winter 2013.

4.3.4.3 Key outcomes

The medium demand forecast for Kingston and Electrona substations in comparison to the proposed capacity resulting from the implementation of this option are shown in Figure 4–12.

Figure 4-12 – Option 4 – Medium demand forecast vs proposed transmission capacity



As shown in Figure 4-12, the establishment of a 110/33 kV connection point at the existing Kingston Substation will address the network limitations as discussed in Section 3. The implementation of Option 4 would:

- enable Transend and Aurora to comply with the requirements of the NER;
- enable Transend to comply with the requirements of Clause 5(1)(a)(i) and Clause 5(1)(a)(iv) of the ESI regulations beyond 2013;
- enable Aurora to transfer load from existing overloaded feeders; and
- provide greater capacity for inter-substation emergency and planned load transfers for future peak periods.

The new 33 kV connection point in the Kingston area has the added benefit of allowing load to be supplied from strategically placed zone substations in the vicinity of large load growth areas, thereby providing improved operational flexibility and a reduction of 11 kV feeder lengths which cause voltage supply issues.

It is anticipated that further augmentation to address future constraints in the Kingston area will not be required until 2032 under this option. The second stage would require a third 110/33 kV

60 MVA transformer at Kingston Substation along with associated switchgear and a 110 kV busbar extension.

4.4 TRANSMISSION NETWORK IMPACTS

Transend has assessed whether the proposed new small transmission network asset could reasonably have a material impact on any interconnected transmission networks and has concluded that no adverse impacts are likely to occur under any of the alternative network options considered in this final report.

5 FINANCIAL ANALYSIS

5.1 PRESENT VALUE ANALYSIS

All cost estimates have been prepared using the same methodology in order to ensure a fully equivalent assessment of the alternative options. These cost estimates have been prepared in accordance with the estimating procedures of Aurora and Transend. All direct costs as defined by the Regulatory Test have been included. Transend cost estimates have a nominal accuracy of ±30 per cent, while Aurora's cost estimates have a nominal accuracy of ±25 per cent. The impact of the accuracy of the cost estimates on the selection of the preferred option has been assessed in the sensitivity analysis presented in Section 5.2.

The discount rates used in undertaking the present value analysis are 7.93 per cent pre-tax real for Transend, and 6.64 per cent pre-tax real for Aurora. These are the values set in the regulatory determinations for the current regulatory period for Transend and Aurora.

Table 5-1 presents results of the cost-benefit analysis for the network options considered. The analysis includes both Aurora's and Transend's capital and operational costs in present value form. The capital cost indicates the initial investment for each option.

Table 5-1 – Cost summary

Option	Aurora capital cost ($ million)	Aurora cost (PV) ($ million)	Transend capital cost ($ million)	Transend cost (PV) ($ million)	Total cost (PV) ($ million)	Ranking
1	29.01	24.15	12	22.0	46.15	3
2	26.24	18	37.1	30.08	48.08	4
3	18.16	25.3	24.4	20.68	45.98	2
4	18.16	25.34	17.45	15.27	40.61	1

5.2 SENSITIVITY ANALYSIS

The options considered were subjected to sensitivity analysis to determine if changing any of the underlying assumptions has an effect on the ranking of the options.

Table 5-2 presents the results of the sensitivity analysis on the options' cost, and ranks the options in terms of lowest present value cost under each scenario considered.

Table 5-2 – Sensitivity analysis results and option ranking

Scenario	Range	Option 1	Option 2	Option 3	Option 4
Medium load growth	Base case	46.15	48.08	45.98	40.61
Rank		**3**	**4**	**2**	**1**
Low load growth	0.7% below base case	37.71	46.67	39.84	34.1
Rank		**2**	**4**	**3**	**1**
High load growth	1.3% above base case	57.34	51.76	51.94	46.57
Rank		**4**	**2**	**3**	**1**
Capex overspend	25% over spend	57.41	59.84	54.6	47.88
Rank		**3**	**4**	**2**	**1**
Capex under spend	25% under spend	34.89	36.3	37.36	33.34
Rank		**2**	**3**	**4**	**1**
Opex over budget	50% over spend	46.7	48.61	46.67	41.31
Rank		**3**	**4**	**2**	**1**
Opex under budget	50% under spend	45.6	47.55	45.3	39.9
Rank		**3**	**4**	**2**	**1**

The underlying assumptions that have been tested in the sensitivity analysis are:

- load growth;
- capital costs; and
- operational costs.

For variances in each of these assumptions, Option 4 ranked 1 in all of the scenarios. Therefore Option 4 is considered a robust solution to the identified network limitations in the Kingston area.

5.3 ANALYSIS RESULT

Under the medium (expected) winter demand forecast, Option 4 – Establish a new 110/33 kV connection point at the existing Kingston Substation is the preferred option because it has the lowest present value cost of the practical alternative options considered.

That is, it is the least cost network option to address the existing and emerging network limitations as discussed in Section 3.

Sensitivity analysis has also verified that under all reasonable scenarios, Option 4 is the lowest present value cost solution. Consequently, Option 4 passes the reliability limb of the Regulatory Test.

Transend and Aurora consider that Option 4 satisfies the regulatory test because it is the least cost option to establish new transmission and distribution assets which are necessitated by the inability to otherwise meet network performance requirements as set out in Schedule 5.1 of the NER and under local jurisdictional requirements. Having identified and examined all reasonable alternatives, Option 4 represents the least cost reliability augmentation.

6 CONCLUSION AND RECOMMENDATION

Based on the analysis undertaken by Transend and Aurora, it is concluded that option 4 is the lowest present value cost option under a majority of reasonable scenarios that fully address the existing and emerging supply constraints in the Kingston area. It is also concluded that option 4 passes the Regulatory Test under the reliability limb.

Based on this conclusion, it is recommended that Transend and Aurora take appropriate action to implement the new small transmission and new large distribution developments as set out in option 4 of this final report in order to address the existing and emerging supply limitations in the Kingston area.

7 DISPUTE NOTICES

Persons wishing to dispute the contents, findings, assumptions or recommendation of this final report are referred to clause 5.6.6 (j) of the NER.

Disputing parties must lodge a notice of the dispute in writing to the AER and provide a copy of the notice to Transend and Aurora within 40 business days of the publication of the summary of this final report on AEMO's website.

Copies of dispute notices should be forwarded to:

Mr Stephen Clark
General Manager Customer and Asset Management
Transend Networks Pty Ltd
2 Birdwood Avenue
Moonah, TAS 7009
Email: Stephen.Clark@transend.com.au

Appendix A

Options Financial Analysis

APPENDIX 1A - MEDIUM LOAD GROWTH SCENARIO

OPTION 1 - THRID 110/11KV TRANSFORMER AT KINGSTON

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		12,000,000											43,900,000												
O&M	0	0	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	102,503	105,503	102,503
Total	0	12,000,000	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	43,997,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	102,503	105,503	102,503
Transend PV	21,996,829		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		7,124,860			5,072,000	4,902,000																			
Feeder		7,599,850		4,313,900									4,330,350		4,313,900				2,502,100						
Pole replacement																						3,800	3,800	5,400	5,400
O&M																									
Overhead Line O&M			2,597	2,597	2,870	3,690	3,690	3,690	3,690	3,690	3,690	3,690	3,690	6,287	6,287	6,287	6,287	6,287	7,380	8,473	7,380	7,380	7,380	7,380	7,380
Undergound Line O&M			7,663	7,663	10,312	12,562	14,812	14,812	14,812	14,812	14,812	14,812	14,812	17,209	17,209	22,574	22,574	22,574	22,574	29,521	21,758	21,758	21,758	21,758	21,758
Substation O&M			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	14,724,710	10,260	4,324,160	5,085,182	4,918,252	18,502	18,502	18,502	18,502	18,502	18,502	4,348,852	23,496	4,337,396	28,861	28,861	28,861	2,532,054	37,994	29,138	32,938	32,938	34,538	34,538
Aurora PV	24,154,122		Discount Rate	6.64%																					
Total PV	46,150,951																								

OPTION 2 - NEW 2 X 60MVA TRANSFORMER 110/11KV SUBSTATION

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		37,100,000																							8,000,000
O&M	0	0	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	102,503	105,503	102,503
Total	0	37,100,000	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	102,503	105,503	8,102,503
Transend PV	30,076,496		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		3,776,000			6,476,000	8,846,000																			
Feeder		2,776,400		4,364,800																					2,100,400
Pole replacement																						900	900	4,900	4,900
O&M																									
Overhead Line O&M			615	615	2,733	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,963	3,963	6,697	6,697	6,697	3,963	3,963	6,697	6,697	6,697	6,697	6,697
Undergound Line O&M			3,593	3,593	6,235	9,295	12,805	12,805	12,805	12,805	12,805	12,805	12,805	14,148	14,148	17,390	17,390	17,390	17,390	21,915	17,330	17,330	17,330	17,330	17,330
Substation O&M			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	6,552,400	4,208	4,369,008	6,484,968	8,858,643	16,153	16,153	16,153	16,153	16,153	16,153	16,153	18,111	18,111	24,087	24,087	24,087	21,354	25,878	24,026	24,926	24,926	28,926	2,129,326
Aurora PV	18,003,079		Discount Rate	6.64%																					
Total PV	48,079,576																								

OPTION 3 - NEW 2 X 60MVA TRANSFORMERS 110/33KV ADJACENT TO EXISTING KINGSTON SUBSTATION SITE

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		24,400,000																		6,000,000					
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	24,497,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	6,097,503	100,503	97,503	100,503	97,503	110,492
Transend PV	20,680,377		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000						300,000	7,000,000									300,000	7,000,000						
Subtransmission		3,715,000							2,670,500										2,490,000						
Feeder		2,776,400		4,364,800					2,976,500		4,181,000				2,231,000				5,888,000		4,405,000		2,840,000		
Pole replacement																							900	900	2,100
O&M																									
Overhead Line O&M			615	615	3,348	3,348	3,348	3,348	3,348	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	9,936	9,936	11,986	11,986	11,986	11,986
Undergound Line O&M			3,580	3,580	6,221	6,221	6,221	6,221	6,221	8,899	8,899	10,946	10,946	10,946	10,946	13,421	13,421	13,421	13,421	18,043	18,043	19,640	19,640	20,990	20,990
Substation O&M			13,933	13,933	13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	41,799	41,799	41,799	41,799	41,799	41,799
Total	300,000	13,491,400	18,128	4,382,928	23,503	23,503	23,503	323,503	12,670,503	42,600	4,223,600	44,648	44,648	44,648	2,275,648	47,123	47,123	347,123	15,425,123	69,777	4,474,777	73,425	2,914,325	75,675	76,875
Aurora PV	25,303,265		Discount Rate	6.64%																					
Total PV	45,983,642																								

OPTION 4 - NEW 2 X 60MVA TRANSFORMERS 110/33KV IN EXISTING KINGSTON SUBSTATION SWITCHYARD

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		17,500,000																		6,000,000					
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	17,597,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	6,097,503	100,503	97,503	100,503	97,503	110,492
Transend PV	15,269,389		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000						300,000	7,000,000									300,000	7,000,000						
Subtransmission		3,715,000							2,670,500										2,490,000						
Feeder		2,776,400		4,364,800					2,976,500		4,181,000				2,231,000				5,888,000		4,405,000		2,840,000		
Pole replacement																							900	900	2,100
O&M																									
Overhead Line O&M			615	615	3,348	3,348	3,348	3,348	3,348	8,364	8,364	10,141	10,141	10,141	10,141	10,141	10,141	10,141	10,141	20,906	20,906	27,591	27,591	31,824	31,824
Undergound Line O&M			3,580	3,580	6,221	6,221	6,221	6,221	6,221	8,899	8,899	10,946	10,946	10,946	10,946	13,421	13,421	13,421	13,421	18,043	18,043	19,640	19,640	20,990	20,990
Substation O&M			13,933	13,933	13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	41,799	41,799	41,799	41,799	41,799	41,799
Total	300,000	13,491,400	18,128	4,382,928	23,503	23,503	23,503	323,503	12,670,503	45,129	4,226,129	48,953	48,953	48,953	2,279,953	51,428	51,428	351,428	15,429,428	80,747	4,485,747	89,030	2,929,930	95,513	96,713
Aurora PV	25,339,419		Discount Rate	6.64%																					
Total PV	40,608,808																								

APPENDIX 1B - HIGH LOAD GROWTH SCENARIO

OPTION 1 - THRID 110/11KV TRANSFORMER AT KINGSTON

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		12,000,000						43,900,000																	
O&M	0	0	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	102,503	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492
Total	0	12,000,000	97,503	97,503	100,503	97,503	100,503	43,997,503	110,492	97,503	100,503	97,503	100,503	102,503	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492
Transend PV	30,187,098		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		7,124,860	5,072,000		4,902,000																				
Feeder		7,599,850	2,880,400	1,433,500				4,330,350		4,313,900			2,502,100												
Pole replacement																						3,800	3,800	5,400	5,400
O&M																									
Overhead Line O&M			2,597	3,472	4,565	3,690	3,690	3,690	6,287	6,287	8,883	8,883	8,883	9,977	9,977	9,977	9,977	9,977	9,977	9,977	9,977	9,977	9,977	9,977	9,977
Underground Line O&M			7,663	11,752	12,562	12,562	12,562	12,562	14,959	14,959	17,356	17,356	20,324	21,906	21,906	21,906	21,906	21,906	21,906	21,906	21,906	21,906	21,906	21,906	21,906
Substation O&M			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	14,724,710	7,962,660	1,448,723	4,919,127	16,252	16,252	4,346,602	21,246	4,335,146	26,240	26,240	2,531,307	31,882	31,882	31,882	31,882	31,882	31,882	31,882	31,882	35,682	35,682	37,282	37,282
Aurora PV	27,150,010		Discount Rate	6.64%																					
Total PV	57,337,108																								

OPTION 2 - NEW 2 X 60MVA TRANSFORMER 110/11KV SUBSTATION

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		37,100,000															8,000,000								
O&M	0	0	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	102,503	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492
Total	0	37,100,000	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	102,503	110,492	110,492	8,110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492	110,492
Transend PV	31,275,447		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		3,776,000	6,476,000		8,846,000																				
Feeder		2,776,400	3,546,800	818,000													2,100,400		4,364,800			1,902,000			
Pole replacement																						900	4,900	4,900	4,900
O&M																									
Overhead Line O&M			615	4,538	4,538	3,348	3,348	3,348	3,963	3,963	4,578	4,578	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312	7,312
Underground Line O&M			3,593	8,800	9,295	9,295	9,295	9,295	10,638	10,638	11,981	11,981	13,880	15,163	15,163	15,163	15,163	15,163	15,163	15,163	15,163	15,163	15,163	15,163	15,163
Substation O&M			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	6,552,400	10,027,008	831,338	8,859,833	12,643	12,643	12,643	14,601	14,601	16,560	16,560	21,192	22,474	22,474	22,474	2,122,874	22,474	4,387,274	22,474	22,474	1,925,374	27,374	27,374	27,374
Aurora PV	20,487,529		Discount Rate	6.64%																					
Total PV	51,762,976																								

OPTION 3 - NEW 2 X 60MVA TRANSFORMERS 110/33KV ADJACENT TO EXISTING KINGSTON SUBSTATION SITE

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		24,400,000														6,000,000									
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	24,497,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	6,097,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Transend PV	21,211,892		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000				300,000	7,000,000								300,000	7,000,000		300,000	7,000,000						
Subtransmission		3,715,000					2,670,500									2,490,000			1,940,000						
Feeder		2,776,400	4,364,800				2,976,500		4,181,000				2,231,000			5,888,000		4,405,000	2,532,000	2,840,000	2,532,000				
Pole replacement																							900	2,100	2,100
O&M																									
Overhead Line O&M			615	3,348	3,348	3,348	3,348	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	8,323	8,323	8,323	8,323	8,323	8,323	8,323	8,323	8,323
Underground Line O&M			3,580	6,221	6,221	6,221	6,221	8,899	8,899	10,946	10,946	10,946	10,946	13,421	13,421	13,421	20,599	20,599	20,599	20,599	20,599	20,599	20,599	20,599	20,599
Substation O&M			13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866
Total	300,000	13,491,400	4,382,928	23,503	23,503	323,503	12,670,503	42,600	4,223,600	44,648	44,648	44,648	2,275,648	47,123	347,123	15,425,123	56,788	4,761,788	11,528,788	2,896,788	2,588,788	56,788	57,688	58,888	58,888
Aurora PV	30,732,727		Discount Rate	6.64%																					
Total PV	51,944,619																								

OPTION 4 - NEW 2 X 60MVA TRANSFORMERS 110/33KV IN EXISTING KINGSTON SUBSTATION SWITCHYARD

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		17,500,000														6,000,000									
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	17,597,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	6,097,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Transend PV	15,800,904		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000				300,000	7,000,000								300,000	7,000,000		300,000	7,000,000						
Subtransmission		3,715,000					2,670,500									2,490,000			1,940,000						
Feeder		2,776,400	4,364,800				2,976,500		4,181,000				2,231,000			5,888,000		4,405,000	2,532,000	2,840,000	2,532,000				
Pole replacement																							900	2,100	2,100
O&M																									
Overhead Line O&M			615	3,348	3,348	3,348	3,348	8,364	8,364	10,141	10,141	10,141	10,141	10,141	10,141	10,141	16,933	16,933	16,933	16,933	16,933	16,933	16,933	16,933	16,933
Underground Line O&M			3,580	6,221	6,221	6,221	6,221	8,899	8,899	10,946	10,946	10,946	10,946	13,421	13,421	13,421	20,599	20,599	20,599	20,599	20,599	20,599	20,599	20,599	20,599
Substation O&M			13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866
Total	300,000	13,491,400	4,382,928	23,503	23,503	323,503	12,670,503	45,129	4,226,129	48,953	48,953	48,953	2,279,953	51,428	351,428	15,429,428	65,398	4,770,398	11,537,398	2,905,398	2,597,398	65,398	66,298	67,498	67,498
Aurora PV	30,768,258		Discount Rate	6.64%																					
Total PV	46,569,161																								

APPENDIX 1C - LOW LOAD GROWTH SCENARIO

OPTION 1 - THRID 110/11KV TRANSFORMER AT KINGSTON

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		12,000,000																43,900,000							
O&M	0	0	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503
Total	0	12,000,000	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	97,503	97,503	43,997,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503
Transend PV	16,218,974		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		7,124,860				5,072,000	4,902,000																		
Feeder		7,599,850				2,880,400	1,433,500											4,330,350			4,313,900				2,502,100
Pole replacement																									
O&M																									
Overhead Line O&M			2,597	2,597	2,597	2,597	3,472	3,690	3,690	3,690	3,690	3,690	3,690	3,690	3,690	3,690	3,690	3,690	8,883	8,883	8,883	8,883	8,883	8,883	8,883
Undergound Line O&M			7,663	7,663	7,663	7,663	11,752	12,562	12,562	12,562	12,562	12,562	12,562	12,562	12,562	12,562	12,562	12,562	17,356	17,356	17,356	20,324	20,324	20,324	20,324
Substation O&M				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	14,724,710	10,260	10,260	10,260	7,962,660	6,350,723	16,252	16,252	16,252	16,252	16,252	16,252	16,252	16,252	16,252	16,252	4,346,602	26,240	26,240	4,340,140	29,207	29,207	29,207	2,531,307
Aurora PV	21,493,062		Discount Rate	6.64%																					
PV	37,712,037																								

OPTION 2 - NEW 2 X 60MVA TRANSFORMER 110/11KV SUBSTATION

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		37,100,000																							
O&M	0	0	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503
Total	0	37,100,000	97,503	97,503	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503	97,503
Transend PV	29,978,712		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation																									
Super Feeder		3,776,000				6,476,000	8,846,000																		
Feeder		2,776,400				3,546,800	818,000																		
Pole replacement																									
O&M																									
Overhead Line O&M			615	615	615	615	4,538	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	4,578	4,578	4,578	7,312	7,312	7,312	7,312
Undergound Line O&M			3,593	3,593	3,593	3,593	8,800	9,295	9,295	9,295	9,295	9,295	9,295	9,295	9,295	9,295	9,295	9,295	11,981	11,981	11,981	13,880	13,880	13,880	13,880
Substation O&M				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	6,552,400	4,208	4,208	4,208	10,027,008	9,677,338	12,643	12,643	12,643	12,643	12,643	12,643	12,643	12,643	12,643	12,643	12,643	16,560	16,560	16,560	21,192	21,192	21,192	21,192
Aurora PV	16,688,192		Discount Rate	6.64%																					
PV	46,666,904																								

OPTION 3 - NEW 2 X 60MVA TRANSFORMERS 110/33KV ADJACENT TO EXISTING KINGSTON SUBSTATION SITE

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		24,400,000																							
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	24,497,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Transend PV	20,118,787		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000										300,000	7,000,000												
Subtransmission		3,715,000											2,670,500												
Feeder		2,776,400			4,364,800								4,067,000			4,181,000				2,231,000					
Pole replacement																							900	900	900
O&M																									
Overhead Line O&M			615	615	615	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836
Undergound Line O&M			3,580	3,580	3,580	6,221	6,221	6,221	6,221	6,221	6,221	6,221	6,221	6,026	6,026	6,026	8,073	8,073	8,073	8,073	10,526	10,526	10,526	10,526	10,526
Substation O&M			13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866
Total	300,000	13,491,400	18,128	18,128	4,382,928	23,503	23,503	23,503	23,503	23,503	23,503	323,503	13,761,003	39,728	39,728	4,220,728	41,775	41,775	41,775	2,272,775	44,228	44,228	45,128	45,128	45,128
Aurora PV	19,722,637		Discount Rate	6.64%																					
Total PV	39,841,424																								

OPTION 4 - NEW 2 X 60MVA TRANSFORMERS 110/33KV IN EXISTING KINGSTON SUBSTATION SWITCHYARD

Year (ending 30 June)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Transend																									
Capital		17,500,000																							
O&M	0	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Total	0	17,597,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492	97,503	100,503	97,503	100,503	97,503	110,492
Transend PV	14,707,799		Discount Rate	7.93%																					
Aurora																									
Capital																									
Substation	300,000	7,000,000										300,000	7,000,000												
Subtransmission		3,715,000											2,670,500												
Feeder		2,776,400			4,364,800								2,976,500			4,181,000				2,231,000					
Pole replacement																							900	900	900
O&M																									
Overhead Line O&M			615	615	615	3,348	3,348	3,348	3,348	3,348	3,348	3,348	3,348	8,364	8,364	8,364	9,321	9,321	9,321	9,321	10,141	10,141	10,141	10,141	10,141
Undergound Line O&M			3,580	3,580	3,580	6,221	6,221	6,221	6,221	6,221	6,221	6,221	6,221	6,026	6,026	6,026	8,073	8,073	8,073	8,073	10,526	10,526	10,526	10,526	10,526
Substation O&M			13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866	27,866
Total	300,000	13,491,400	18,128	18,128	4,382,928	23,503	23,503	23,503	23,503	23,503	23,503	323,503	12,670,503	42,256	42,256	4,223,256	45,260	45,260	45,260	2,276,260	48,533	48,533	49,433	49,433	49,433
Aurora PV	19,396,134		Discount Rate	6.64%																					
Total PV	34,103,933																								

Appendix B

Compliance with Clauses 5.6.2 and 5.6.6A of the NER

This section sets out a compliance checklist which demonstrates the compliance of this application notice with the requirements of clauses 5.6.2 and 5.6.6A of the NER version 29.

NER clause	Summary of Requirements	Comments/evidence of compliance
5.6.2 (a1)	The terms Network Service Provider, Transmission Network Service Provider and Distribution Network Service Provider when used in this clause 5.6.2 are not intended to refer to, and are not to be read or construed as referring to, any Network Service Provider in its capacity as a Market Network Service Provider.	Note
5.6.2 (a)	Each Transmission Network Service Provider and Distribution Network Service Provider must analyse the expected future operation of its transmission networks or distribution networks over an appropriate planning period, taking into account the relevant forecast loads, any future generation, market network service, demand side and transmission developments and any other relevant data.	Refer to Section 1.2 of this final notice Transend has provided its analysis in the published Annual Planning Reports
5.6.2 (b)	Each Transmission Network Service Provider must conduct an annual planning review with each Distribution Network Service Provider connected to its transmission network within each area. The annual planning review must incorporate the forecast loads submitted by the Distribution Network Service Provider in accordance with clause 5.6.1 or as modified in accordance with clause 5.6.1(d) and must include a review of the adequacy of existing connection points and relevant parts of the transmission system and planning proposals for future connection points.	Refer to Section 1.2 of this final notice Transend has documented its planning review in the published Annual Planning Reports.
5.6.2 (c)	Where the necessity for augmentation or a non-network alternative is identified by the annual planning review conducted under clause 5.6.2(b), the relevant Network Service Providers must undertake joint planning in order to determine plans that can be considered by relevant Registered Participants, AEMO and interested parties.	Refer to Section 1.2 of this final notice Transend and Aurora Energy have undertaken a joint planning process to develop the options and solution presented in this Application Notice.
5.6.2 (d)	The minimum planning period for the purposes of the annual planning review is 5 years for distribution networks and 10 years for transmission networks.	Refer to Transend Annual Planning Report 2009, & Aurora Energy Distribution System Planning Report 2009. Transend and Aurora planning horizons comply with this requirement

5.6.2 (e)	Each Network Service Provider must extrapolate the forecasts provided to it by Registered Participants for the purpose of planning and, where this analysis indicates that any relevant technical limits of the transmission or distribution systems will be exceeded, either in normal conditions or following the contingencies specified in schedule 5.1, the Network Service Provider must notify any affected Registered Participants and AEMO of these limitations and advise those Registered Participants and AEMO of the expected time required to allow the appropriate corrective network augmentation or non-network alternatives, or modifications to connection facilities to be undertaken.	Refer to Transend Annual Planning Report 2009, & Aurora Energy Distribution System Planning Report 2009. The final report forms the final stage in the required consultation process.
5.6.2 (f)	Within the time for corrective action notified in clause 5.6.2(e) the relevant Distribution Network Service Provider must consult with affected Registered Participants, AEMO and interested parties on the possible options, including but not limited to demand side options, generation options and market network service options to address the projected limitations of the relevant distribution system except that a Distribution Network Service Provider does not need to consult on a network option which would be a new small distribution network asset.	Refer to Section 1.2 of this final report. Aurora Energy and Transend have undertaken a joint planning process to develop the options and solution presented in this Final report This final report forms the final stage in the DNSP consultation process required by this clause.
5.6.2 (g)	Each Distribution Network Service Provider must carry out an economic cost effectiveness analysis of possible options to identify options that satisfy the regulatory test, while meeting the technical requirements of schedule 5.1, and where the Network Service Provider is required by clause 5.6.2(f) to consult on the option this analysis and allocation must form part of the consultation on that option.	Refer Section 5.1 of this final report Aurora Energy and Transend have undertaken a joint planning process to develop the options and solution presented in this final report. The options analysis is presented in Section 6 of this final report.
5.6.2 (h)	Following conclusion of the process outlined in clauses 5.6.2(f) and (g), the Distribution Network Service Provider must prepare a report that is to be made available to affected Registered Participants, AEMO and interested parties which: (1) includes assessment of all identified options; (2) includes details of the Distribution Network Service Provider's preferred proposal and details of: (A) its economic cost effectiveness analysis in accordance with clause 5.6.2(g); and (B) its consultations conducted for the purposes of clause 5.6.2(g); (3) summarises the submissions from the consultations; and 4) recommends the action to be taken.	This provision is not applicable to the preparation of this final report. This final report forms the final stage in the DNSP consultation process. Following the initial consultation, Aurora Energy and Transend propose to prepare a final report in accordance with Transend's obligations under clause 5.6.6 (h). This document would also address Aurora Energy's obligations under clause 5.6.2 (h)
5.6.2 (i) to (j)	These clauses contain provisions relating to the processes applying where a Registered Participant disputes certain matters in relation to the final report	These provisions are not applicable to the preparation of this final report.

5.6.2 (k)	Following: (1) completion of the 40 business day period referred to in clause 5.6.2(i) or on resolution of any dispute in accordance with rule 8.2, in relation to proposals to which clause 5.6.2(j) applies; or (2) completion of the report referred to in clause 5.6.2(h), in relation to any other network option recommended by the report, the relevant Distribution Network Service Provider must arrange for the network options (if any) recommended by its report made in accordance with clause 5.6.2(h) to be available for service by the agreed time.	These provisions are not applicable to the preparation of this final report.
5.6.2 (kl)	The Distribution Network Service Provider must include the cost of the relevant assets of the network options referred to in clause 5.6.2(k) in the calculation of distribution service prices determined in accordance with Chapter 6.	These provisions are not applicable to the preparation of this final report.
5.6.2 (l)	If a use of system service or the provision of a service at a connection point is directly affected by a transmission network or distribution network augmentation, appropriate amendments to relevant connection agreements must be negotiated in good faith between the parties to them.	These provisions are not applicable to the preparation of this final report.
5.6.2 (m)	Where the relevant Transmission Network Service Provider or Distribution Network Service Provider decides to implement a generation option as an alternative to network augmentation, the Network Service Provider must: (1) register the generating unit with AEMO and specify that the generating unit may be periodically used to provide a network support function and will not be eligible to set spot prices when constrained on in accordance with clause 3.9.7; and (2) include the cost of this network support service in the calculation of transmission service and distribution service prices determined in accordance with Chapter 6 or Chapter 6A, as the case may be.	These provisions are not applicable to the preparation of this final report.

5.6.2 (n)	AEMO must provide to the Inter-Regional Planning Committee, and to other Network Service Providers on request, a copy of any report provided to NEMMCO by a Network Service Provider under clause 5.2.3(d)(12). If a Registered Participant reasonably considers that it is or may be adversely affected by a development or change in another area, the Registered Participant may request the preparation of a report by the relevant Network Service Provider as to the technical impacts of the development or change. If so requested, the Network Service Provider must prepare such a report and provide a copy of it to AEMO, the Registered Participant requesting the report and, on request, any other Registered Participant.	These provisions are not applicable to the preparation of this final report.
5.6.6A (a)	Each Transmission Network Service Provider must consult with any interest parties on any matter relating to a proposed new small transmission asset set out in the annual planning report. Interested parties may make written submissions to the Transmission Network Service Provider. To be valid, a submission must be received within 20 business days of publication of the annual report.	Transend proposes to comply with this provision by preparing this joint final report with Aurora.
5.6.6A (b)	At the conclusion of the consultation process in clause 5.6.6A(a): (1) if there is any material change in the matters referred to in clauses 5.6.2A(b)(4) and (5) with respect to the new small transmission asset as a result of the consultation process, the Transmission Network Service Provider must publish again the matters set out in clauses 5.6.6A(4) and (5) in relation to such new small transmission asset incorporating the agreed or amended matters; and (2) The AER must taken into account the report published by the Transmission Network Service Provider in accordance with clause 5.6.6A(b)(1) and all material submitted to the Transmission Network Service Provider in the consultation process in the process of its determination of the total revenue cap for Transmission Network Service Provider and whether the new small transmission asset the subject of consultation satisfies the regulatory test.	These provisions are not applicable to the preparation of this final report.
5.6.6A (c)	In relation to a new small transmission network asset which was not identified in the Annual Planning Report or if a matter set out in the Annual Planning Report pursuant to clause 5.6.2A(b) has materially changed since the publication of the Annual Planning Report for the Transmission Network Service Provider must prepare a report that is to be published to all Registered Participants, NEMMCO and interested parties which sets out the matters referred to in clause 5.6.2A(b)(4) and (5) in relation to the new small transmission asset.	Transend and Aurora have complied with this provision by publishing an application notice on AEMO's website and on their respective websites. This is the final report following on from the application notice.

5.6.6A (d)	Each Transmission Network Service Provider must consult with any interested parties on any matter relating to a proposed new small transmission asset set out in a report prepared pursuant to clause 5.6.6A(c). Interested parties may make written submissions to the Transmission Network Service Provider. To be valid, a submission must be received within 20 business days of publication of the report prepared pursuant to clause 5.6.6(c).	Transend and Aurora have complied with this provision by preparation of an application notice and this final report.
5.6.6A (e)	at the conclusion of the consultation process in clause 5.6.6A(d): (1) if there is any material change in the matters referred to in clause 5.6.2A(b)(4) and (5) with respect to the new small transmission network asset as a result of the consultation process the Transmission Network Service Provider must publish again the matters set out in clause 5.6.2A(b)(4) and (5)in relation to such new small transmission network asset, incorporating the agreed or amended matters; and (2) The AER must take into account the matters raised in the consultation process in its determination of the total revenue cap for the Transmission Network Service Provider and its determination whether the new small transmission network asset the subject of the consultation satisfies the regulatory test.	Transend and Aurora have complied with this provision by preparing this final report.