

# NEED/OPPORTUNITY STATEMENT (NOS)



Canberra 132 kV Connection of ActewAGL Strathnairn ZS

NOS- 00000001443 revision 3.0

**Ellipse project description:** Canberra 132 kV ActewAGL Connection of New West Belconnen Zone Substation

**TRIM file:** [TRIM No]

**Project reason:** To meet connection point reliability requirements

**Project category:** Prescribed - Connection

## Approvals

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<b>Reviewed</b>	Charbel Lahoud	Engineer
<b>Endorsed</b>	Vincent Ong	Network and Connection Analysis Manager
	Azil Khan	Investment Analysis Manager
<b>Approved</b>	Nalin Pahalawaththa	M/PSA
<b>Date submitted for approval</b>	9 December 2016	

## Change history

Revision	Date	Amendment
0	6/05/2016	Initial Issue
1	9/05/2016	Formatting changes
2	23/05/2016	Updated load at risk
3	27/10/2016	Formatting changes and updates to risk cost
4		Rename of ActewAGL ZS from "West Belconnen" to "Strathnairn" Changed Need Date based on advice from customer Clarified all risk cost breakdowns

## 1. Background

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Canberra 330 kV Substation supplies load in the Canberra area at 132 kV. The substation also provides an interconnection point for regional generation to the grid. Generation connections include Capital Wind Farm, Upper Tumut and Lower Tumut. Five 330 kV lines are connected to the substation, the 3 generators plus Yass and Williamsdale. Two 375 MVA three phase transformers and two original 400MVA 3 x single phase transformers supply load to seven 132 kV feeder bays. The 132 kV busbar also has four capacitor banks providing reactive power support of 1 x 80 MVar and 3 x 120 MVar.

Figure 1 on page 4 shows the high voltage diagram (HVOD) of Canberra Substation.

Through the joint planning (JP) process, ActewAGL has informed TransGrid that it plans to establish a new zone substation (ZS) at to meet the supply needs of the ACT Government's planned West Belconnen precinct suburbs of Strathnairn and Macnamara. These suburbs are the first part of the planned ACT-NSW cross-border residential development of Ginninderry.<sup>1</sup>

This initial development will be supplied from a new Strathnairn ZS, which is expected to take an initial (maximum) load of 1.5 MVA in 2020<sup>2</sup>.

## 2. Need/opportunity

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The planned Need Date for Strathnairn ZS is 2020 to meet the timeline set out by the ACT Government for development of the new Ginninderry project. The timing is to be confirmed with ActewAGL through the JP process.

ActewAGL has estimated the forecast demand to be supplied from Strathnairn ZS to grow at a rate of around 1.5 MVA per year for 30 years.

### 2.1 Risks

The National Electricity Rules (NER) clause 5.14 – Joint Planning requires TransGrid (and ActewAGL) to jointly plan their regional electricity network. In this case, should TransGrid not participate with ActewAGL in addressing this Need, it would be violating this statutory obligation.

A further risk of not addressing this Need is a loss of load, that is, unserved energy (USE), at the new Strathnairn and Macnamara suburbs due to electricity supply not being provided as required according to TransGrid's utility license in the ACT.<sup>3</sup>

The load at risk which is being assessed here is the forecast peak load of 6 MVA in 2023 at Strathnairn ZS, multiplied by a load factor of 0.8. As this is a new development and there is no load data available yet, the 0.8 factor is used as a reasonable estimate of the likely average demand over summer 2022/23.<sup>4</sup>

Assuming a load power factor of 0.95 (minimum NER requirement under clause S5.3.5), this equates to  $6 * 0.95 * 0.8 = 4.56$  MW.

The risk cost of not addressing this Need is therefore composed of the following components:

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<sup>1</sup> ACT Government 2016, 'Strathnairn and Macnamara become Canberra's newest suburbs', *Open Government*, ACT Government 25 July, 2016, <[http://www.cmd.act.gov.au/open\\_government/inform/act\\_government\\_media\\_releases/yvette-berry-mla-media-releases/2016/strathnairn-and-macnamara-become-canberras-newest-suburbs](http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/yvette-berry-mla-media-releases/2016/strathnairn-and-macnamara-become-canberras-newest-suburbs)>, accessed 8 December 2016.  
See also [Ginninderry Illustrative Masterplan](#).

<sup>2</sup> Email from ActewAGL, dated 12 July 2016, <<http://thewire/projects/prew/000000001443/Supporting%20Documents/FW%20ActewAGL%20Planning%20Documents.msg>>, accessed 8 December 2016.

<sup>3</sup> Refer [ACT Utilities Technical Regulator, Electricity Transmission Supply Code](#).

<sup>4</sup> Load factor = average demand / maximum demand over the period assessed.

- > exposing customer load of 4.56 MW to risk of being unsupplied.
- > damage to TransGrid's reputation (negative media coverage).
- > litigation by customers/consumer groups.

The total cost of these risks has been calculated in TransGrid's Investment Risk Tool thus:

#### VCR Risk Cost (Unserviced Energy)

$$VCR \text{ risk cost} = \text{load at risk} * \text{probability of Strathnairn going unsupplied for one day}^5 * VCR^6$$

$$\therefore VCR \text{ risk cost} = 4.56 \text{ MW} * 24 \text{ hrs} * \$26,930/\text{MWh}$$

$$\therefore VCR \text{ risk cost} = \$2.95 \text{ million per annum}$$

#### Reliability Risk Cost

$$Reliability \text{ risk cost} = VCR \text{ risk cost} + \text{litigation costs}$$

$$\therefore Reliability \text{ risk cost} = \$2.95\text{m} + \$0.01\text{m}^7 = \$2.96 \text{ million per annum}$$

#### Financial Risk Cost

$$Financial \text{ risk cost} = \text{internal investigation costs} = \$10,000^8$$

#### Reputational Risk Cost

$$Reputational \text{ risk cost} = \text{external consultations \& communications costs} = \$33,000^9$$

#### Total Risk Cost

$$Total \text{ risk cost} = Reliability \text{ risk cost} + Financial \text{ risk cost} + Reputational \text{ risk cost}$$

$$\therefore Total \text{ risk cost} = \$3.0 \text{ million per annum}$$

A risk-cost summary extract from the Investment Risk Tool appears in Attachment 1.

### 3. Related needs/opportunities

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- > [Need DCN238 - Canberra Substation Condition – Need Date 2019](#)

This Need is at post-PAD stage and the approved project is for a piecemeal replacement of Canberra Substation, to be completed by 2019.

- > [Need 1695 - ActewAGL Molonglo Establishment – Need Date 2021](#)

This Need is for the connection of a new Molonglo zone substation to TransGrid's A-1 Canberra to Woden line.

### 4. Recommendation

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It is recommended that OFR and OFS be compiled to determine the cost of works to facilitate the new connection to a spare 132 kV switchbay at Canberra Substation.

<sup>5</sup> This is a snapshot of the risk cost during a single day of summer 2022/23.

<sup>6</sup> TransGrid's Investment Risk Tool bases the Value of Customer Reliability (VCR) on figures published by AEMO in its *Value of Customer Reliability Review - Final Report*, September 2014. In this case we use the residential figure of \$26,930/MWh.

<sup>7</sup> This component is an assumed litigation risk cost of this event.

<sup>8</sup> This component is an assumed financial risk cost of this event.

<sup>9</sup> This component is an assumed reputational risk cost of this event.



# Attachment 1 Risk Cost Summary

## Current Option Assessment - Risk Summary



Project Name: Connection of ActewAGL's Proposed Strathnairn ZS to Canberra Substation

Option Name: 1443 - Base Case

Option Assessment Name: 1443 - Base Case - Assessment 1

Rev Reset Period: Next (2018-23)

Major Component	No.	Minor Component	Sel. Hazardous Event	LoC x CoF (\$M)	Failure Mechanism	NoxLoC xCoF (\$M)	PoF (Yr 1)	Total Risk (\$M)	Risk (\$M) (Rel)	Risk (\$M) (Op)	Risk (\$M) (Fin)	Risk (\$M) (Peo)	Risk (\$M) (Env)	Risk (\$M) (Rep)
Cable connection to Canberra Substation	1	High Voltage Cable	Unplanned Outage - HV (Cable connection to Canberra Substation)	\$3.00	Infrastructure Failure	\$3.00	100.00%	\$3.00	\$2.96		\$0.01			\$0.03
				\$3.00		\$3.00		\$3.00	\$2.96		\$0.01			\$0.03

Total VCR Risk: \$2.95

Total ENS Risk: \$0.00

