

NEED/OPPORTUNITY STATEMENT (NOS)



Western Sydney Development

NOS- 000000001687 revision 1.0

Ellipse project no(s): P0010077

TRIM file: [TRIM No]

Project reason: Reliability - To meet overall network reliability requirements

Project category: Prescribed - Augmentation

Approvals

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Approved	Nalin Pahalawaththa	Manager / Power System Analysis
Date submitted for approval	[Publish Date]	

Change history

Revision	Date	Amendment
0	26/10/2016	Initial Issue
1		Amended to include references to government growth plans in Western Sydney and updated risk cost breakdown.

1. Background

Endeavour Energy has a network of substations and transmission lines in Sydney's South West Sector, supplying the area load. The South West Sector is supplied from TransGrid's network via Liverpool and Sydney West 330/132 kV substations.

There is a requirement from the NSW Government to accommodate the development of approximately 100,000 residential dwellings and 23km² of employment lands in Sydney's South West Sector (SWS). It is expected that, fully developed, the load in the area will exceed the capability of the Endeavour Energy network to supply the load (subject to any demand management initiatives and actual future customer demand).¹

Separate to, but adjacent to the SWS on its northern boundary, is the Broader Western Sydney Employment Area (BWSEA) which includes the [future airport site at Badgerys Creek](#).² The BWSEA includes 81km² of future employment lands which has the potential ultimate load of up to 650 MVA.³

Endeavour Energy has analysed existing infrastructure, evaluated options, and has concluded that an additional 132 kV injection point in the form of a new 132 kV switching station in close proximity to TransGrid's Kemps Creek 500/330 kV Substation or Badgerys Creek Airport 132 kV Bulk Supply Point (BSP) needs to be established to accommodate the increased area load.⁴ Badgerys Creek Airport is expected to require electricity supply from 2023 in order to enable it to begin operations in 2025. This NOS covers the need to meet this supply in the short term, with further development stages to be assessed beyond the 2018/19 to 2022/23 regulatory control period.

2. Need/opportunity

Endeavour Energy has requested via the Joint Planning process that TransGrid investigate the installation of a 132 kV injection point at either TransGrid's Kemps Creek 500/330 kV Substation or near Badgerys Creek Airport under 330 kV 39 Sydney West to Bannaby transmission line.

The expected Need date for the injection point to supply the airport (in the first stage) is in summer 2023/24. The timing is to be confirmed with Endeavour Energy through the ongoing Joint Planning process.

2.1 Risks

The National Electricity Rules (NER) clause 5.14 – Joint Planning requires TransGrid (and Endeavour Energy) to jointly plan their regional electricity network. In this case, should TransGrid not participate with Endeavour Energy in evaluating options to address 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 airport (initially) due to electricity supply not being provided as required.

The load at risk which is being assessed here is the forecast peak airport load of 25 MW in 2023, multiplied by a load factor of 0.8. As the airport 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. The load at risk therefore equates to $25 * 0.8 = 20$ MW.

¹ <http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/South-West-Priority-Growth-Area>

² http://westernsydneyairport.gov.au/resources/key_documents/

³ <http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/Western-Sydney-Employment-Area>

⁴ See Endeavour Energy projects in [Endeavour Energy Letter](#) dated 19 August 2016, Attachments 1, 10 and 11.

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

- > exposing customer load of 20 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)

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

$\therefore VCR \text{ risk cost} = 20 \text{ MW} * 24 \text{ hrs} * \$44,720/\text{MWh}$

$\therefore VCR \text{ risk cost} = \$21.47 \text{ million per annum}$

Reliability Risk Cost

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

$\therefore Reliability \text{ risk cost} = \$21.47\text{m} + \$0.5\text{m}^7 = \$21.97 \text{ million per annum}$

Financial Risk Cost

$Financial \text{ risk cost} = \text{internal investigation costs} = \$50,000^8$

Reputational Risk Cost

$Reputational \text{ risk cost} = \text{external consultations \& communications costs} = \$487,500^9$

Total Risk Cost

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

$\therefore Total \text{ risk cost} = \$22.5 \text{ million per annum}$

3. Related needs/opportunities

Nil.

4. Recommendation

It is recommended that options be considered to address the identified need to supply the Badgerys Creek airport by Summer 2023/24, with provision for future supply to the SWS and BWSEA.

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

⁶ 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 industrial load figure of \$44,720/MWh.

⁷ This component is an assumed litigation risk cost for this event.

⁸ This component is an assumed financial risk cost for this event.

⁹ This component is an assumed reputational risk cost for this event.

Attachment 1 Risk costs summary

Current Option Assessment - Risk Summary



Project Name: Energy's SWS, BWSEA and Badgerys Creek Airport

Option Name: 1687 - Base Case

Option Assessment Name: 1687 - Option 1 - 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)
132 kV Supply Point	1	Busbar	Unplanned Outage - HV (132 kV Supply Point)	\$22.50	Structural Failure	\$22.50	100.00%	\$22.50	\$21.97		\$0.05			\$0.49
				\$22.50		\$22.50		\$22.50	\$21.97		\$0.05			\$0.49

Total VCR Risk: \$21.47

Total ENS Risk: \$0.00

