Addressing increased customer demand requirements in the Rozelle area

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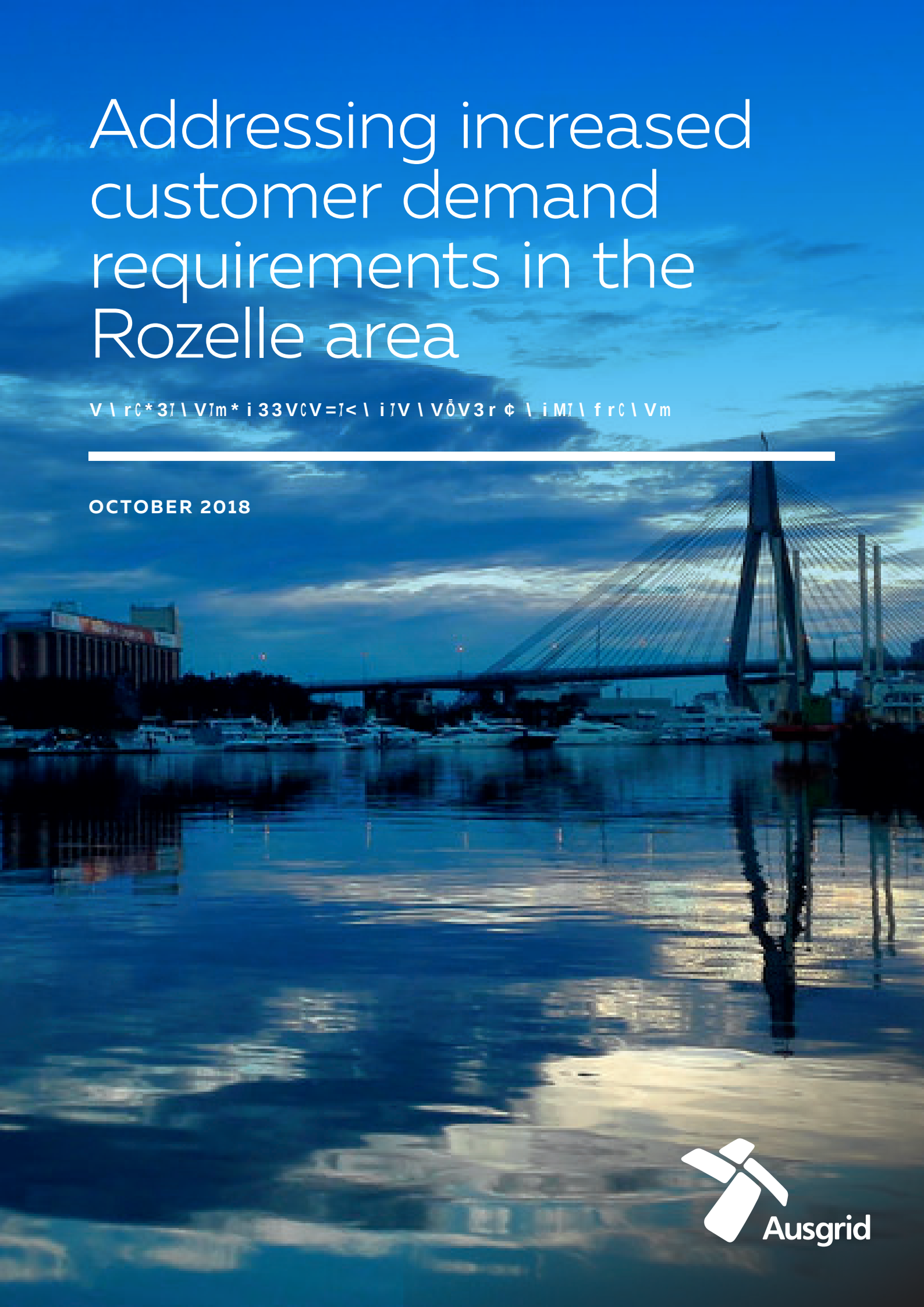

Ausgrid

Addressing increased customer demand requirements in the Rozelle area

Notice on screening for non-network options – October 2018

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1 Introduction

Ausgrid has received connection applications from Roads and Maritime Services (RMS) to provide permanent firm electricity supply (N-1 supply) for the Rozelle Interchange (Stage 3B of the WestConnex motorway project) and for the proposed Western Harbour Tunnel project. In addition, there are other significant load requirements currently foreshadowed in the vicinity of the Rozelle area, such as the redevelopment of the White Bay area, which is part of a broader initiative that is likely to integrate a future metro station and harbour activities into urban renewal plans.

RMS has submitted a connection request for a permanent N-1 supply of 33MVA for the Rozelle Interchange (Stage 3B of the WestConnex motorway project), as well as 32MVA for the proposed Western Harbour Tunnel. The Rozelle Interchange is expected to commence construction in 2018/19 and be open to traffic by 2023 with electricity supply required for testing in advance of the opening in mid 2022. The Western Harbour Tunnel is currently at planning stage and is expected to be open to traffic prior to 2026 (subject to planning approval and funding and financing arrangements) with electricity supply required in advance of the opening. Section 5.2.3 of the National Electricity Rules (NER) obliges Ausgrid to enable connection of these sites to the distribution network.

The scale of expected load is such that the existing network cannot accommodate it without network augmentation. Ausgrid has therefore identified the need to expand the sub-transmission network supplying the Rozelle area and is commencing this RIT-D, as the expected capital cost of investment is greater than $5 million (i.e. the threshold for RIT-D application).

Ausgrid notes that specific tariff arrangements will be established to recover the majority of the cost of the augmentation from the beneficiaries (i.e. the new customers), taking into account their share in the capacity added to the network. These customers will be charged a cost reflective network price, determined specifically from this network augmentation investment, plus allocated costs from the use of the upstream system - i.e. through ‘Distribution Use of System (DUOS) tariffs. Customers will directly fund the dedicated assets associated with their connections.

Whilst Ausgrid has an obligation to enable the connection of these customers, in accordance with section 5.2.3 of the NER, construction works will only commence on this augmentation once the material components of the connection agreement contract with RMS for the supply of the Rozelle Interchange have been executed, leaving opportunity for staged augmentation in the future.

A full discussion of asset conditions and the identified need can be found in the Draft Project Assessment Report (DPAR) for addressing increased customer demand in the Rozelle area.

This notice has been prepared under cl. 5.17.4(d) of the NER and summarises Ausgrid’s determination that no non-network option is, or forms a significant part of, any potential credible option for this RIT-D. In particular, it sets out the reasons for Ausgrid’s determination, including the methodologies and assumptions used.

2 Existing and forecast

2.1 Existing load and capacity

Rozelle 132/33kV STS predominantly functions as a 132kV transmission switching station, interconnecting Drummoyne, Leichhardt, Croydon, Pyrmont and City Central substations.

Currently, the 33kV supply from Rozelle STS is solely dedicated to providing electricity to the Sydney Trains network via a direct connection (i.e. no 33kV busbar). Electricity distribution to Rozelle and adjacent suburbs is provided at 11kV, with no other accessible 33kV source in this area.

The Sydney Trains network supply is via a direct supply from a single transformer (N supply arrangement). The second transformer had provided a 33kV supply to Leichhardt zone substation prior to it's conversion to a 132kV supply and is now spare. This transformer is capable of providing non-firm N supply only.

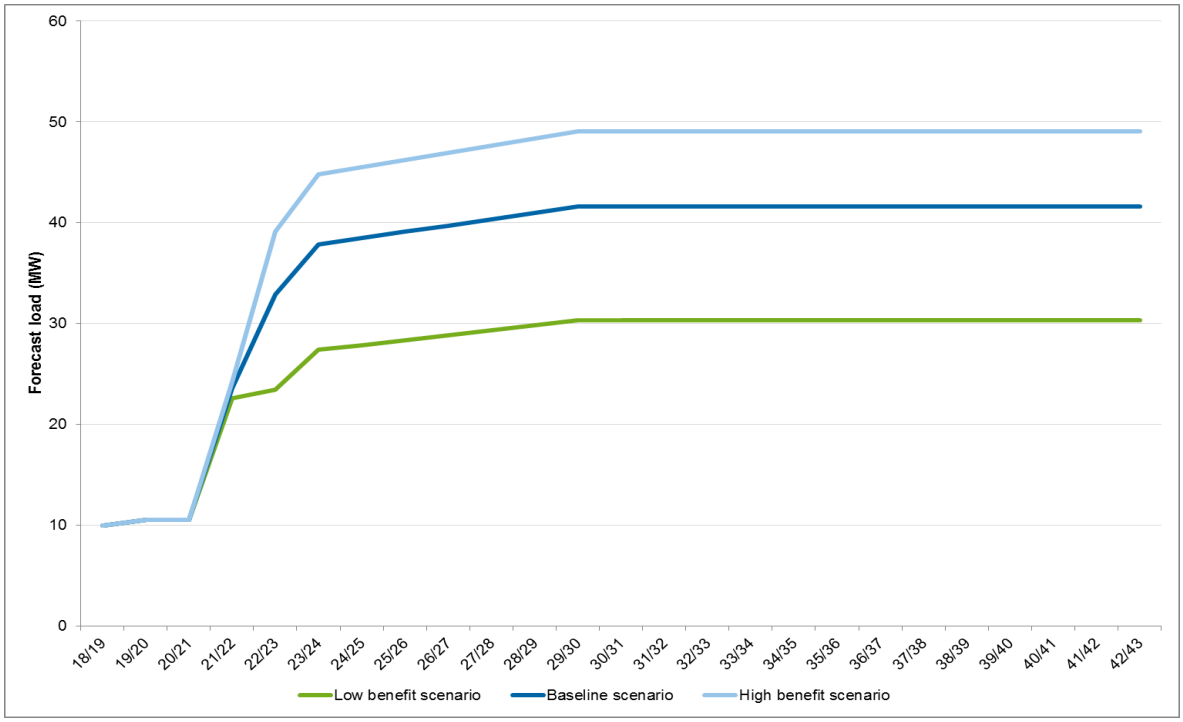
2.2 Forecast demand

Based upon information from Sydney Trains, maximum demand at Rozelle STS from the Sydney Trains network is forecast to increase by about 1.9MVA by 2023/24; an increase of about 20% on current maximum demand. The current capacity of the dedicated transformer is sufficient to cater for this load increase.

Additional load is largely due to new large customer connections. Roads and Maritime Services (RMS) has requested permanent firm electricity supply (N-1 supply) for the Rozelle Interchange by mid-2022. RMS has requested permanent firm electricity supply (N-1 supply) for the Western Harbour Tunnel prior to opening to traffic. The White Bay redevelopment is also likely to require supply by mid-2022. Rozelle STS is currently not capable of providing N-1 supply. Furthermore, it is possible that urban renewal plans will integrate a new Metro station in the Bays Precinct, for which supply for the construction and operation can also be provided from a 33kV supply from Rozelle STS.

Figure 1 following outlines three scenarios for these expected loads in the Rozelle area. Included in the baseline scenario forecast are loads for Sydney Trains, Rozelle Interchange, Western Harbour Tunnel and White Bay redevelopment. The high benefit scenario includes all loads in the baseline scenario plus the cruise terminal. The low benefit scenario forecast includes Sydney Trains, Rozelle Interchange and White Bay redevelopment. At this stage, the forecast scenarios exclude load from a possible Metro station or traction supply.

Figure 1 – Demand forecast for Rozelle STS



3 Proposed preferred network option

Ausgrid has elected to assess three alternative future scenarios – namely:

- Low benefit scenario – Ausgrid has adopted several assumptions that give rise to a lower bound NPV estimate for each credible option, in order to represent a conservative future state of the world with respect to potential market benefits that could be realised under the credible option;
- Baseline scenario – the baseline scenario consists of assumptions that reflect Ausgrid's central set of variable estimates, which, in Ausgrid's opinion, provides the most likely scenario; and
- High benefit scenario – this scenario reflects an optimistic set of assumptions, which have been selected to investigate an upper bound on reasonably expected potential market benefits.

Given that no non-network options have been found viable (see Section 4), Ausgrid considers the appropriate discount rate is the regulated cost of capital, which is equivalent to 4.19 per cent at the time of preparing this DPAR and is used across all scenarios investigated.

A summary of each scenario and the sets of variable values adopted are presented in the table below.

Table 1 – Summary of the three scenarios investigated

Variable	Scenario 1 – baseline	Scenario 2 – low benefits	Scenario 3 – high benefits
Load Growth	Expected load growth (includes Sydney Trains, Rozelle Interchange, Western Harbour Tunnel and White Bay redevelopment)	Lower than expected growth (includes Sydney Trains Rozelle Interchange and White Bay redevelopment)	Higher than expected growth (expected load growth plus new cruise terminal)
Capital Cost	100% of capital cost estimate	125% of capital cost estimate	75% of capital cost estimate
VCR	$41/kWh (Derived from AEMO VCR estimate of $38.35/kWh at state level, CPI indexed)	$29/kWh (30 per cent lower than AEMO VCR estimate)	$53/kWh (30 per cent higher than AEMO VCR estimate)

Ausgrid considers that the baseline scenario is the most likely, since it is based primarily on a set of expected/central assumptions. Ausgrid has therefore assigned this scenario a weighting of 50 per cent, with the other two scenarios being weighted equally with 25 per cent each. However, Ausgrid notes that the identification of the preferred option is the same across all three scenarios, i.e. the result is insensitive to the assumed scenario weights.

Ausgrid has identified only one credible network option to address the immediate capacity constraint resulting from the growing customer demand in the Rozelle area. Other options could technically address the identified need, but are unable to meet the customer required connection date or cost significantly more without providing corresponding increases in benefits. The other options considered include establishing a new STS on a greenfield site and expansion of Alexandria STS. However, these options were found to be technically and/or commercially unfeasible, or unable to meet the customer's required connection date.

Preferred option at this draft stage

The identified credible option involves the installation of new 33kV switchgear in a new switchroom building to be located at the western end of the Rozelle STS site, and the replacement of existing 132/33kV 30MVA transformer No.2 with a new 60MVA unit. The new building will accommodate a 33kV switchgear arrangement suitable to meet N-1 supply requirements of the identified customers and with the capability to be expanded in the future, if new load requirements are realised. The construction work also includes new transformer bay walls and bunds/bases to contain the existing and the replacement transformer. The project will also involve trenching to install 33kV ductlines, which will exit the new building and continue along part of the nearest road (i.e. Manning Street) and which are required to connect the existing

33kV cable with the new equipment and provide new connection points for WestConnex Stage 3B and the future prospective customers.

The estimated capital cost of this option is approximately $23.2 million and its commissioning date is expected to be in 2021/22. Once the upgrade is completed, operating costs are expected to average 0.5% of the capital expenditure per annum (i.e. $116,000 per year).

Considering this project is triggered by major customers requesting network connection, specific tariff arrangements will be established to recover the cost of the shared network augmentation from beneficiaries, taking into account their share in the capacity added to the network. The cost recovery mechanism will be part of the customer connection agreements and acts as a means of mitigating against the risk of having stranded network assets. It is noted that customers will directly fund dedicated assets associated with their connections.

4 Assessment of non-network solutions

4.1 Required demand management characteristics

The current supply arrangements at Rozelle STS are such that only two 33kV connected customers can be supplied via separate non-firm 'N' supplies from the two existing transformers. At present there is only one directly connected customer and one spare transformer. The spare transformer had provided a 33kV supply to Leichhardt zone substation prior to it's conversion to a 132kV supply. At present, only a single N supply connection for one new major customer connection is available without augmentation.

Due to the supply arrangements at Rozelle STS, and where one or more customers request an N-1 connection, no amount of partial permanent or temporary demand reductions from the current or proposed customers would mitigate the need for a network upgrade to enable N-1 supply. Consequently, a viable demand management solution must be capable of providing an alternate source of supply for customers requiring 33kV connection to the network.

At the requested connection date of mid-2022 for the Rozelle interchange, a backup supply shortfall of 33MVA is required. In addition, by about 2022, further supply capacity of about 7MVA is required to serve the White Bay area.

In the following year, at the expected connection date of about mid-2023 for the Western Harbour Tunnel, an N-1 supply capacity of a further 32MVA is required plus an estimated further 1MVA for the White Bay area.

A summary of the forecast capacity shortfall in 2022 and 2023 for the baseline scenario is detailed in the table below.

Table 3 – Network support required at Rozelle STS (Baseline scenario)

Year	Customer requested capacity (MVA)	Forecast maximum demand (MW)	Forecast annual supply shortfall (MWh)	Average forecast daily supply shortfall (MWh/day)	Shortfall hours per year
2022	40	13	74,000	201	8760
2023	73	22	124,000	340	8760

Note that the supply capacity requested from each major customer has been adjusted in the forecast to account for a range of probability, coincidence and discount factors; based upon Ausgrid's forecast methodology and discussions with connecting customers. The resultant discount on the total requested capacity is about 65%, largely due to capacity requirements for abnormal tunnel operation.

To be considered a feasible option, any demand management solution must be technically feasible, commercially feasible; and able to be implemented in sufficient time to satisfy the requested customer connection dates in 2022 and 2023 for deferral of the network investment.

4.2 Demand management assessment

Ausgrid has assessed potential demand management options to make the project deferral technically and economically viable. As the only plausible solution is an alternate source of supply for the additional customers requsting 33kV connection to the network, we have assessed this option to determine whether the likely funds available can offer an alternative. We do not consider that temporary or permanent demand reductions would offer a viable alternative for this issue.

Total available funds for an alternative solution sufficient to address the issue are $0.9m for each year of deferral of the network investment. The available funds correspond to:

- a maximum of $22 per kVA of capacity or $12 per MWh of forecast energy volume for a one year deferral; and
- a maximum of $24 per kVA of capacity or $14 per MWh for a two year deferral.

This level of funds is not considered sufficient to provide the required redundant power supplies for customers.

5 Conclusion

Based on the demand management options considered in Section 4, it is not considered possible that sufficient demand management measures could be feasibly implemented to achieve the required demand reduction to make project deferral technically and economically viable. Consequently, a Non-Network Options Report has not been prepared in accordance with rule 5.17.4(c) of the National Electricity Rules.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