

## DEMAND MANAGEMENT SCREENING TEST

### Paxton Wollombi Laguna Reliability

#### Current Supply Arrangements

11kV feeder 48039 at Paxton Zone Substation is a long rural feeder supplying rural areas including parts of Paxton, Wollombi, Laguna and areas south as far as the Burrellong Valley.

This feeder has no interconnection with other 11kV feeders, resulting in poor reliability performance. Frequency and duration of outages currently fall outside the required minimum performance levels.

A grid-connected 1MW diesel generator is currently installed in the Laguna area for network support purposes. The generator is operated to provide continuity of supply during a program of feeder upgrade works, and provides voltage support during peak demand periods.

#### Reliability Performance

Summer is the critical season for this feeder. The customers are predominantly a mix of rural residential and farming sectors.

Peak demand on feeder 48039 was 3.8MVA in summer 2008/09, and is growing at 5.7% per year.

Fault duration and frequency data for this feeder for the last five financial years is given in the table below. These do not meet current Long Rural Feeder reliability standards.

Year	2003/04	2004/05	2005/06	2006/07	2007/08
Average duration (mins)	1121	1564	477	1641	710
Average frequency	11.65	8.61	3.39	6.04	5.70

#### Supply Strategy Option

The proposed supply side investment consists of construction of a second 11kV feeder from Paxton Zone Substation to the Laguna area.

The estimated cost of this project is \$7m. The proposed commissioning date is November 2010, with an investment decision date of April 2009.

## Required Demand Management Characteristics

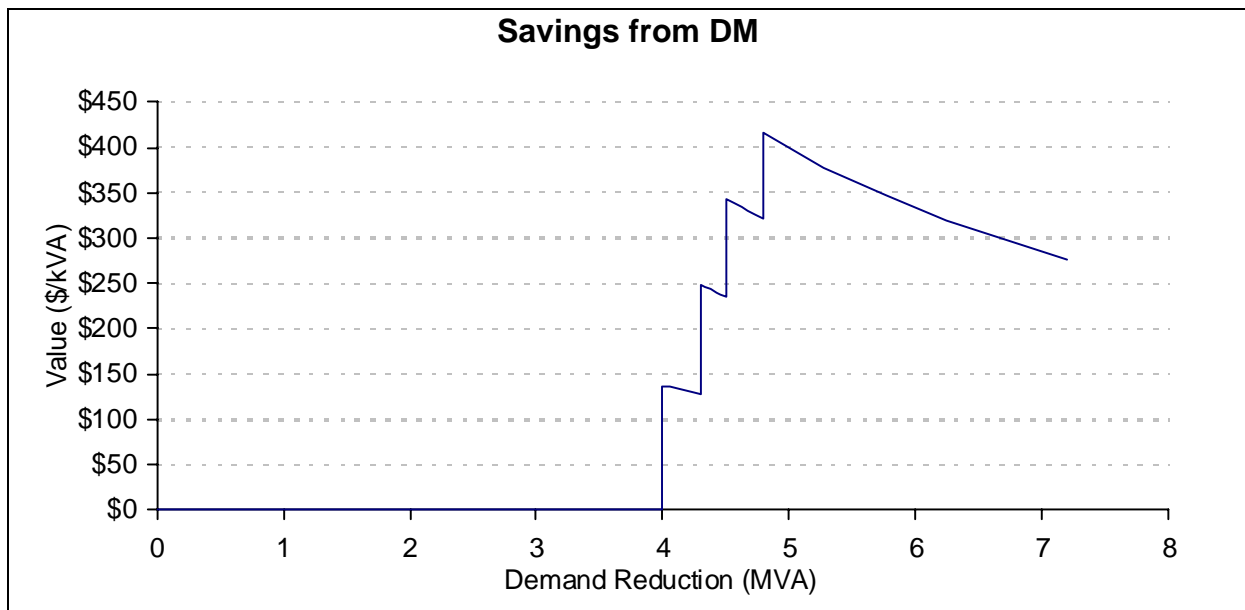
The supply solution will improve reliability by providing an alternative source of supply, enabling faster restoration for all faults upstream of the point of common connection.

An alternative would be to provide a non-network alternative source (eg independent generation or energy storage). This could be centralised and located at the same point as the proposed new feeder connection. It could also be achieved by multiplying distributed sources located nearer to, or within customer sites.

In either case, the solution would need to be sufficient to provide the same improvement in reliability as the proposed supply solution. This would need a capacity of 4.25MVA in summer 2010/11 rising by 0.25MVA per year.

If an alternative method of providing adequate reliability for customers on feeder 48039 could be achieved in summer 2010/11, then the supply side project could be deferred for one year. The value of this deferral is \$550,000, or \$138/kVA, which is moderate.

The value of a two year deferral is \$1.06m, or \$248/kVA. The value of a three year deferral is \$1.55m or \$343/kVA.



Two possible demand side options to improve the reliability of supply to customers on feeder 48039 have been considered. The first is to provide energy storage units at each customer site, and the second is to provide an expanded diesel generation capability at or near the existing Laguna unit.

Given that the number of customers on feeder 48039 is over one thousand, the option of individual storage units at each site has not been pursued further on the basis on cost and practicality.

To provide an appropriate level of backup supply, we have assumed that 4 x 1.25MVA diesel generators would be required, running for around 100 hours per

year. Based on experience with existing diesel generation sites, we have estimated annual operating costs at \$1.04m per year, or \$208/kVA per year. These costs do not include initial site set up costs.

The network support requirement (in MVA) is high, and the project deferral value is moderate. Cost estimates for the most viable demand side option where we have experience – embedded diesel generation – are higher than the savings from deferring the supply side proposal.

We therefore conclude that it is not reasonable to expect that the supply side project could be cost effectively deferred.

### **Recommendation**

Based on this analysis it is not considered reasonable to expect that it would be cost-effective to postpone the proposed supply-side solution by implementing demand management strategies.