

Augex – Minor Growth Other Investment Case

Background

Investment is required for subtransmission minor projects which are undertaken to enhance operational flexibility, minimise the risk of loss of supply, reduce safety risk and improve quality of customer supply to meet NER 6.5.7 objectives.

To ensure the subtransmission network is operated and maintained in a manner that is cost effective and provides a reliable and safe means of electrical energy transmission. To satisfy this need there are often various minor subtransmission capital expenditure projects that are required and cannot be easily anticipated and captured into a defined program of work or major project cost allocation. Although hard to forecast, these minor projects are often required to maintain network performance and offer a significant benefit for a comparatively nominal cost.

Minor subtransmission projects are initiated through planning. Strategic planning/modelling of a subtransmission bulk supply point area and analytics of historical loss of supply (unplanned outage) data. In some cases an unplanned outage event will trigger a closer look at individual points on the network.

Investment Options

Types of investments include, but not limited to:

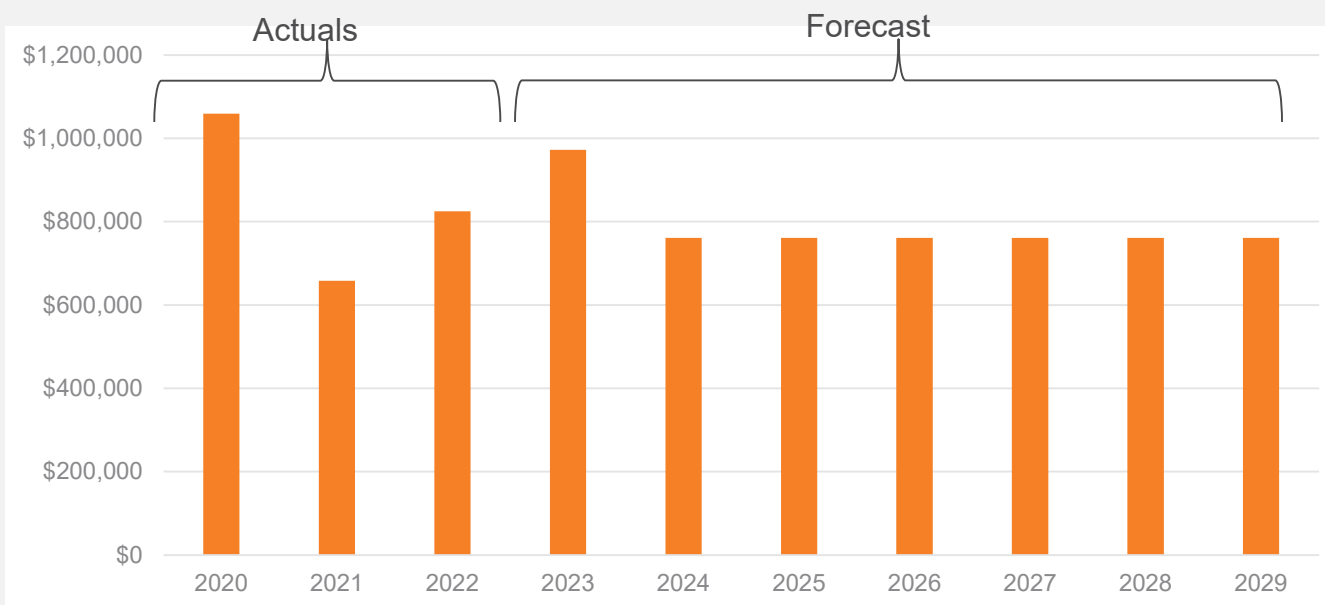
- New switching devices within zone substation (ZS) or on subtransmission feeder; circuit breakers and reclosers
- Auto-changeover schemes within ZS
- Subtransmission feeder works, augmentation of tees to loop in/out
- Voltage regulation devices
- Additional secondary system devices (protection relays, additional scada for remote switching)

All individual projects are subject to cost benefit analysis (40-year Net Present Value) before proceeding. The benefit, being mostly improved supply reliability, is based on Value of Customer Reliability (VCR \$/MWh). Non-network solutions are considered, but in most cases, especially with switching devices that minimise loss of supply, and improve reliability, non-network options are not feasible.

Examples of completed projects are summarised on following page.

10 Year CAPEX Forecast

Forecast expenditure for the 2024-29 period is \$3.8M. This is approximately equal to the 2019-24 actual/forecast. The approach to forecasting this program expenditure was to apply an average trend to spend in recent years. We are not proposing an increased level of expenditure in the FY25 -29 regulatory period.



Note: All values are in middle of the year 2023-24 real dollar terms

Data source: Actuals: Internal delivery reports, Forecasts: Forward projection of historic expenditure

Augex – Minor Growth Other Investment Case (cont.)

Justification

Forecast expenditure for the 2024-29 period is \$3.8M. The benefits expected from these investments are:

- **Customer Supply:** maintain supply reliability, minimise the risk of loss of supply, improved quality of supply via better voltage regulation
- **Compliance:** maintain and operate the network to required Regulatory Acts and Codes of Practice
- **Safety:** improved safety for working personnel and public via remote switching and fast acting protection devices that reduce potential for explosive failure of major equipment
- **Environmental:** reduce the risk of equipment failure leading to environmental damage (bushfire, oil spillage etc)
- **Financial:** reduce the risk of costly replacement of failed equipment

Previous Projects

The following is a summary of some recently complete subtransmission minor projects:

Viney Creek Rd – replace 33kV gas switch with remote switch

Hawks Nest 132/33kV ZS is a single 132/33kV transformer site with a 132kV tee connection that supplies Tea Gardens 33/11kV ZS. On loss of the 132kV incoming tee or single 132/33kV transformer, 33kV supply to Tea Gardens ZS is provided by the Stroud-Bulahdelah 33kV network. Switching over to this network was via a manually operated 33kV gas switch. The manually operated gas switch was replaced with a remote operated switch, reducing backup restoration times significantly. Cost - \$75k Benefit - \$340k

Burren Junction 66/22kV ZS – install protection relays

Burren Junction ZS is in one section of two 66kV subtransmission networks that provide 66kV supply to Brewarrina, Lightning Ridge and Walgett 66/22kV ZS's. These three ZS's are supplied radially from Narrabri (Narrabri-Walgett 170km) with an alternate 66kV supply from Narrabri (via Wee Waa/Burren Junction 180km) which is normally open at Walgett. The 66kV and 22kV networks are long and lightly loaded, with substantial inherent capacitance in the networks. The 66kV voltage levels can be extreme (75+kV) and result in high customer voltages due to; light loadings during middle of the day (household PV) and the limited 66/22kV ZS transformers buck ranges (12%). Closing the alternate 66kV supply (via Wee Waa/Burren Junction) at Walgett reduces the 66kV levels to manageable levels and provides at certain times alternate 66kV supply with no loss of supply during faults on normal supply. To close the ring new protection relays were required at Burren Junction ZS Cost - \$345k Benefit - \$1.05M

Yass 66/11kV ZS – install 66kV circuit breaker

Yass 66/11kV ZS is supplied by a radial 66kV feeder (4km) from Transgrid's 330/132/66kV Yass substation. Yass 66/11kV ZS also provides supply to Marilba 66/11kV ZS via a 66kV feeder (21km) that was connected via a manually operated air break switch (ABS) onto the Yass ZS 66kV busbar. With no 66kV feeder circuit breaker (CB) at Yass ZS on the Marilba feeder, faults on this feeder would result in loss of supply to Yass ZS via trip of the 66kV CB at Transgrid's substation. Supply to Yass ZS would be restored after the 66kV ABS at Yass was manually opened and the Transgrid 66kV CB closed. Installation of a 66kV feeder CB at Yass ZS on the Marilba feeder isolated the Marilba feeder faults at Yass ZS rather than at Transgrid's substation. No loss of supply at Yass ZS was suffered with a fault on the Yass – Marilba 66kV feeder. Cost – \$615K Benefit - \$2.7M