AUGMENTATION

LOWER MORNINGTON PENINSULA SUPPLY AREA

UE BUS 3.04 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Overview

The Lower Mornington Peninsula (LMP) comprises the area south of Mount Eliza, Baxter and Pearcedale. It covers approximately 720 square kilometres of land with a coastline that extends over 190km and encompasses approximately 10% of Victoria's coastline.

Demand growth in the area is driving increasing amounts of energy at risk. Increasing energy at risk is primarily due to a voltage collapse constraint, where if one of the two sub-transmission lines serving the area has a fault, it could lead to cascading blackouts across the entire LMP area.

Customers in the LMP are also at risk of worsening reliability or resilience events occurring, especially along the southern half of the LMP where the sub-transmission network is less developed.

We currently operate a non-network solution consisting of 9MW of diesel generation and 1MW of battery storage, however demand growth in the area will surpass the capabilities of our non-network program in the 2026–31 regulatory period.

The preferred solution to address voltage collapse constraints and improve resilience for customers is to construct the new sub-transmission line from HGS to RBD and construct a new zone substation in Shoreham. This option is preferred because it addresses the identified need and delivers the highest net benefits for customers including improved reliability, access to more capacity to electrify and enhanced resilience against long duration outages.

Table 1 shows the capital expenditure forecast for the preferred option.

TABLE 1 EXPENDITURE FORECASTS FOR PREFERRED OPTION ($M 2026)

CAPITAL EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
Construct HGS-RBD sub-transmission line and new Shoreham zone substation	-	-	-	31.6	31.6	63.2

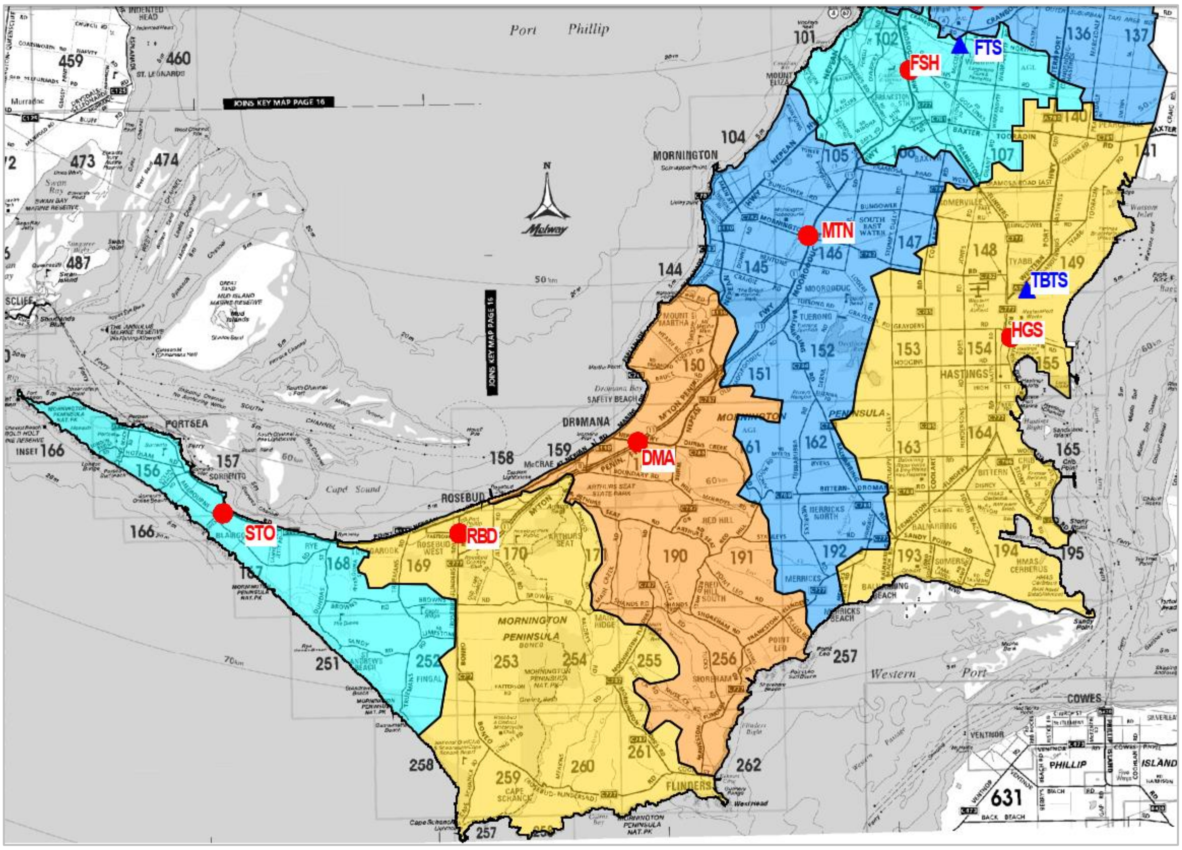
We investigated the potential for an expanded non-network solution as an alternative option, but found that it was not economic. This project will also be subject to a regulatory investment test for distribution (RIT–D) before the economic timing of the preferred network option to maximise the chance of a viable non-network solution being identified.

2. Lower mornington peninsula supply area

The Lower Mornington Peninsula (LMP) comprises the area south of Mount Eliza, Baxter and Pearcedale as shown in figure 1. It covers approximately 720 square kilometres of land with a coastline that extends over 190km and encompasses approximately 10% of Victoria's coastline.

The area is currently serviced by three zone substations, Dromana (DMA), Rosebud, (RBD), and Sorrento (STO). These zone substations run along the north-western coastline.

FIGURE 1 LOWER MORNINGTON PENINSULA AREA

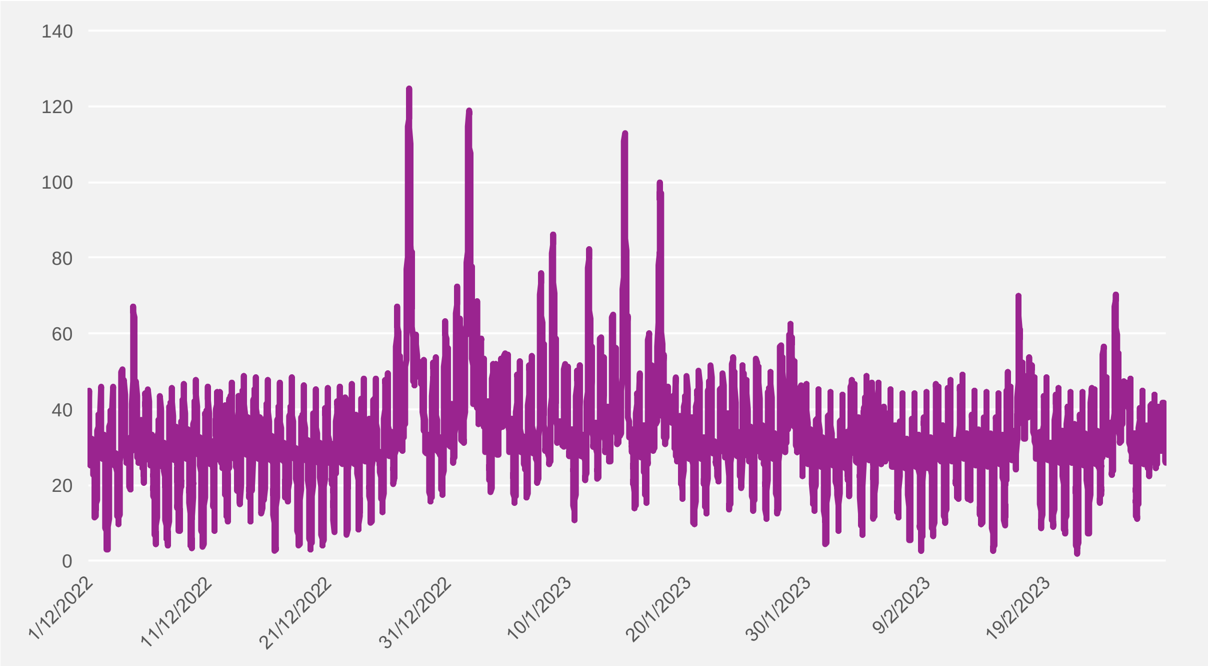


The Lower Mornington Peninsula is a popular holiday destination for our customers, which results in seasonal demand peaks as highlighted in the load profile displayed in Figure 2.

The four pronounced peaks shown in below occur between the start of the Christmas period, covering the new year period and extending through to late January. During this time, the LMP experiences close to double the load of standard summer peaks.

Maintaining security of supply during these holiday peak periods is becoming increasingly more difficult, as detailed in section 3.1.

FIGURE 2 SEASONAL LOAD PROFILE OF THE LOWER MORNINGTON PENINSULA (MW)



2.1 Current use of non-network solutions to defer potential investment

We currently have an operational non-network solution program across the LMP to defer economic augmentation. Our non-network solution program includes 9 MW of diesel generators that we currently operate and 1 MW of battery energy storage BESS provided by Pacific Blue.

The size of the batteries and the voluntary nature of the demand reduction schemes make their delivery uncertain in practice. Therefore, we model the impact of the non-network solution program as a 9MW reduction in demand across the LMP. The existing cost of this program is around $600,000 per year to contract the provision of non-network solution for a period of eight to 10 weeks over the year.

This cost of maintaining these non-network solutions is expected to escalate for the FY26 summer with the expiry of the 5-year non-network solution contracts in 2025.

3. Identified need

Demand growth in the area is driving higher amounts of energy at risk and more pronounced voltage constraints at a high voltage level. Customers in the LMP are also at risk of worsening reliability or resilience events occurring, especially along the southern half of the LMP where the sub-transmission network is less developed.

The identified need is to provide a reliable supply of electricity to customers across our LMP supply area as forecast demand continues to increase, including avoiding the risk of a voltage collapse scenario that could lead to widespread outages across the LMP.

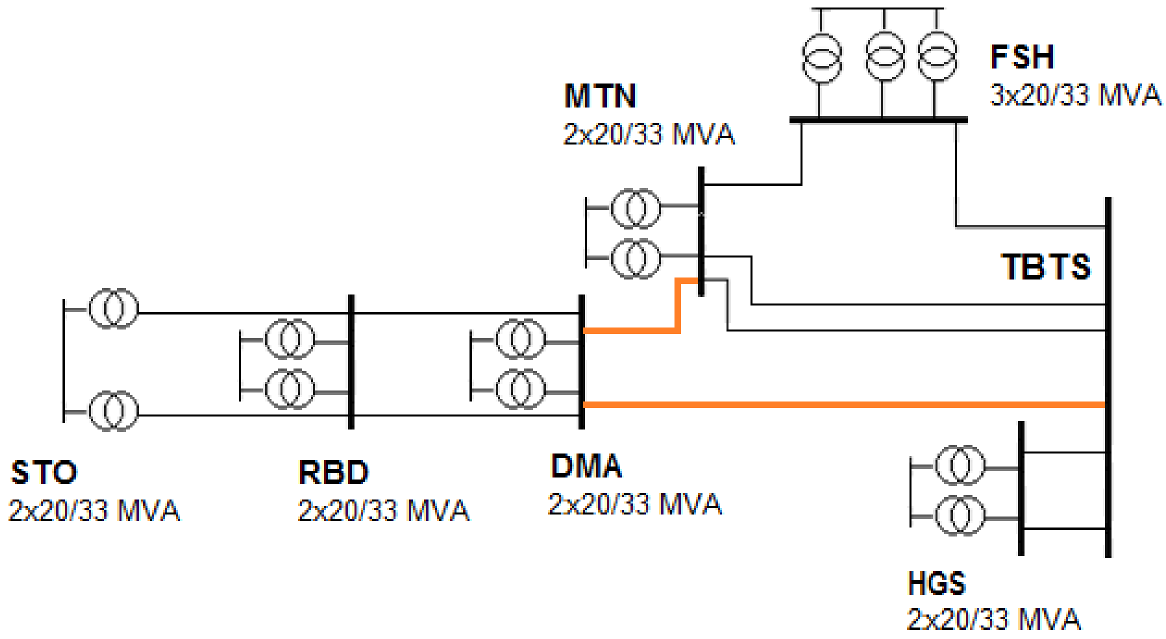
3.1 Voltage collapse constraint

The Tyabb Terminal Station-Dromana (TBTS-DMA) and the Mornington-Dromana (MTN-DMA) sub-transmission lines currently supply the DMA, RBD and STO zone substations, collectively referred to as the LMP zone substations.

Figure 3 below shows the TBTS-DMA and MTN-DMA sub-transmission lines that supply the LMP area in orange.

Because of the current configuration of the network, the LMP is vulnerable to voltage collapse if one of the sub-transmission lines supplying the LMP zone substations fails if combined demand at DMA, RBD and STO exceeds 123MW. Voltage collapse would lead to a widespread outage across all of the LMP zone substations.

FIGURE 3 SUB-TRANSMISSION NETWORK IN THE MORNINGTON PENINSULA



3.2 Managing expected demand

Figure 4 shows the seasonal maximum demand forecasts for the Lower Mornington Peninsula. The seasonal nature of holiday visitors has substantial impact on the yearly maximum demand.

The summer one-in-two year forecast exceeds the 123MVA voltage limit in 2026, which would lead to system security challenges if one of the sub-transmission lines failed.

FIGURE 4 LOWER MORNINGTON PENINSULA MAXIMUM DEMAND FORECAST (MW)

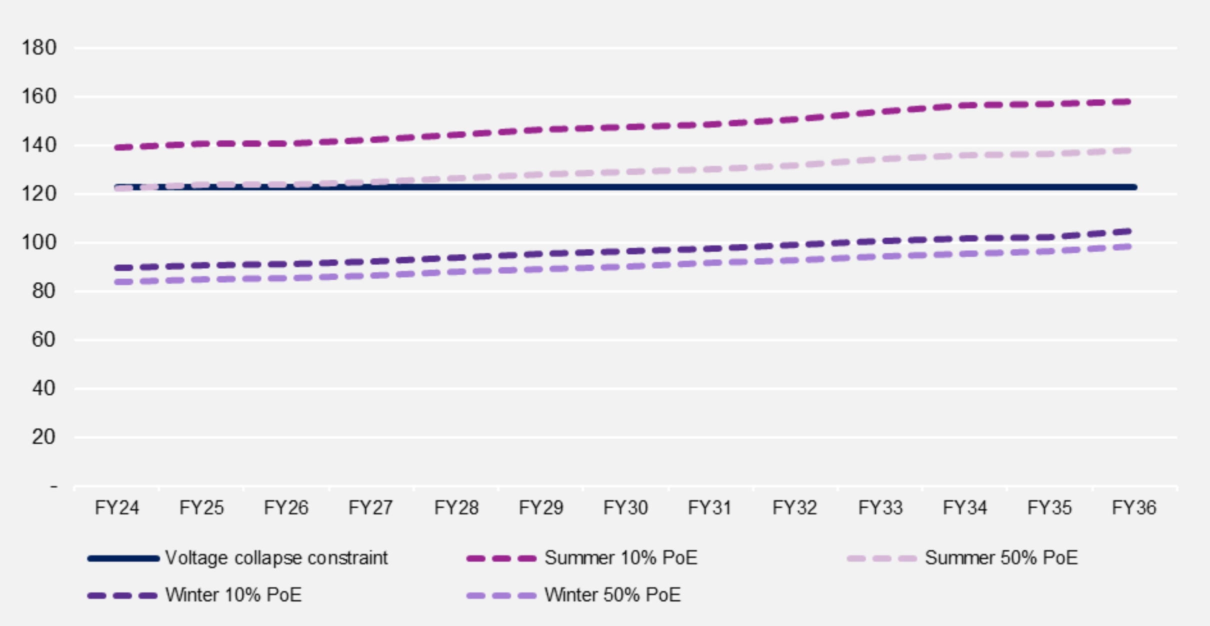


Figure 5 shows the annual forecast energy at risk and the value of unserved energy across the LMP. Residual energy at risk first occurs in 2024 and steadily increases over the 2026–31 regulatory period.

FIGURE 5 VALUE OF EXPECTED UNSERVED ENERGY ($M, 2026)

3.3 Improving reliability for worst-served customers

Customers on the LMP have some of the poorest reliability experiences across our entire network, with several of our worst performing feeders located in the area. These feeders are typically longer than other feeders and span through denser, more vegetated areas, which means they are more impacted during major events such as storms.

Four of these feeders including DMA15, DMA23, MTN32 and RBD21 deliver on average 608 minutes off supply to customers per annum, over 500 minutes more than our network average. Customers on these feeders also experience more than four times as many outages than our average customer.

These outcomes are inconsistent with what our customers expect in terms of reliability, resilience and equity.

Customer perspectives

During our engagement program, our customers emphasised the importance of reliability and resilience, particularly for worst-served customers.

Stakeholders generally supported resilience investments aimed at mitigating risks in high-risk areas like the Mornington Peninsula. There was consensus that these measures were critical for reducing the impact of extreme weather events, particularly in areas prone to bushfires and strong winds.

Participants at our special interest group sessions including councils and community groups strongly supported solutions enhancing resilience and reliability, particularly for worst-served customers and regions prone to natural disasters. Equity also emerged as a significant theme, with customers advocating for fair and inclusive access to resilience investments, especially in rural and high-risk areas.

At our trade-off forums, customers were most willing to invest in network resilience, with 81 per cent of residential customers and 70 per cent of small to medium business customers supporting investment to improve resilience. For the majority of customers, enhancing network resilience was crucial for the benefits it brings to the entire community.

"Resilience should increase reliability. Doing nothing or only investing moderately is effectively going backwards as the extreme weather increases and population growth increases in lower populated high risk townships." – Residential customer[1]

[1] Forethought, Trade-Off Evaluations Report, 2024, p. 34.

4. Assessment of credible options

Several options were considered to meet forecast demand growth across the Lower Mornington Peninsula supply area. A summary of the costs, benefits and net present value of each option considered is described below and shown in table 2 below.

TABLE 2 OPTIONS SUMMARY ($M, 2026)

OPTIONS		PV COSTS	PV BENEFITS	NET BENEFITS
1	Maintain status quo	-	-	-
2	Construct HGS-RBD sub-transmission line	-19.1	22.1	3.0
3	Construct HGS-RBD sub-transmission line and new Shoreham zone substation	-31.6	37.6	6.0
4	Expanded non-network solution capability	-5.7	-2.0	-7.7

A full description of the costs, benefits and optimal timing of each option can be found in our detailed cost-benefit modelling.[2]

4.1 Option one: maintain Status quo

This option maintains the current status quo, including currently available operational responses such as limited load transfers and the current 10MW non-network solution program, described in section 2.1 above.

With no additional risk mitigation, forecast demand growth will lead to increased supply interruptions and greater potential asset failures as forecast loads exceed the voltage collapse limits of the sub-transmission network under certain contingency scenarios. Where demand exceeds the voltage collapse limits, pre-contingent load shedding will be required to maintain system security.

Therefore, this option fails to address the identified need of maintaining reliability of electricity supply for customers within required standards.

4.2 Option two: construct HGS-RBD sub-transmission line

This option includes the construction of a new 66kV sub-transmission line in the LMP area during the 2026–31 regulatory period from the Hastings (HGS) zone substation to the Rosebud (RBD) zone substation.

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The new 66kV sub-transmission line connecting HGS to RBD will resolve the voltage collapse constraint and manage the system security risk. Once completed, this line will ensure that the local sub transmission network can withstand the loss of a single line beyond 2050. It will also support long-term demand growth across the LMP.

The HGS-RBD sub-transmission consists of approximately 54 kilometres of new 66kV line with a combination of overhead and underground works depending on the practical limitations along the proposed route. Figure 6 below shows a geographic overlay of the proposed route.

FIGURE 6 HGS-RBD PROPOSED LINE ROUTE

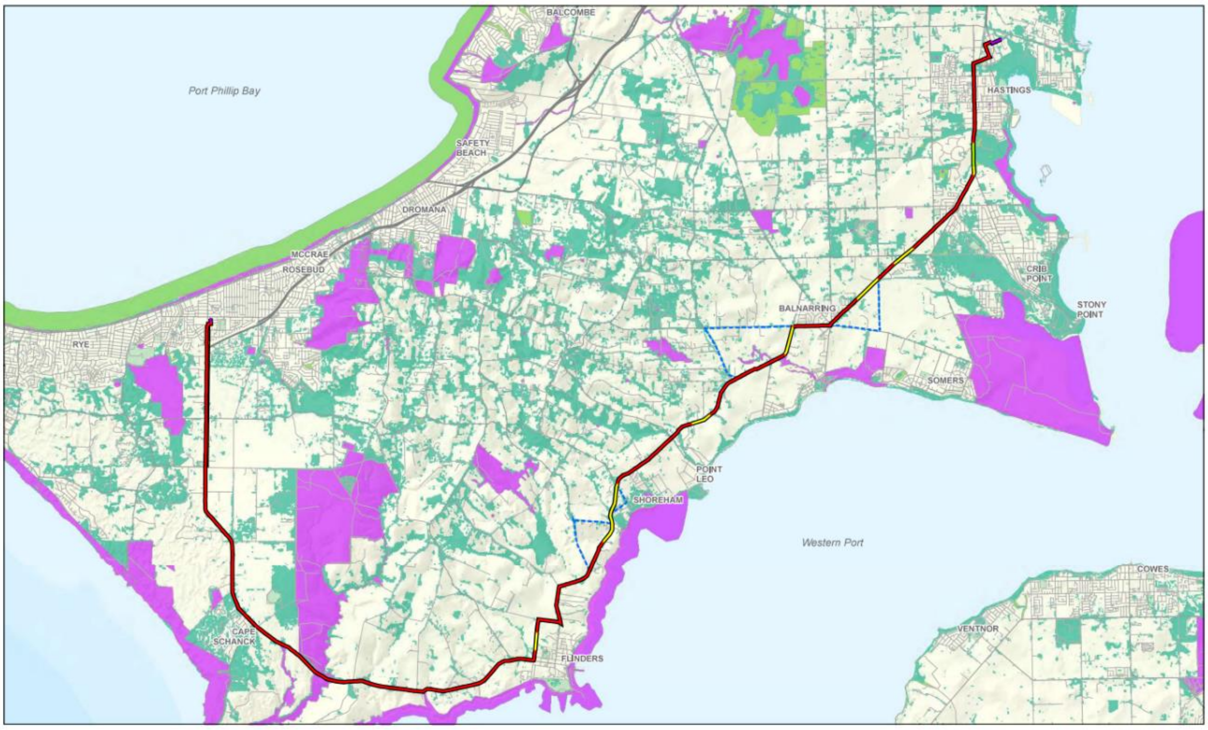
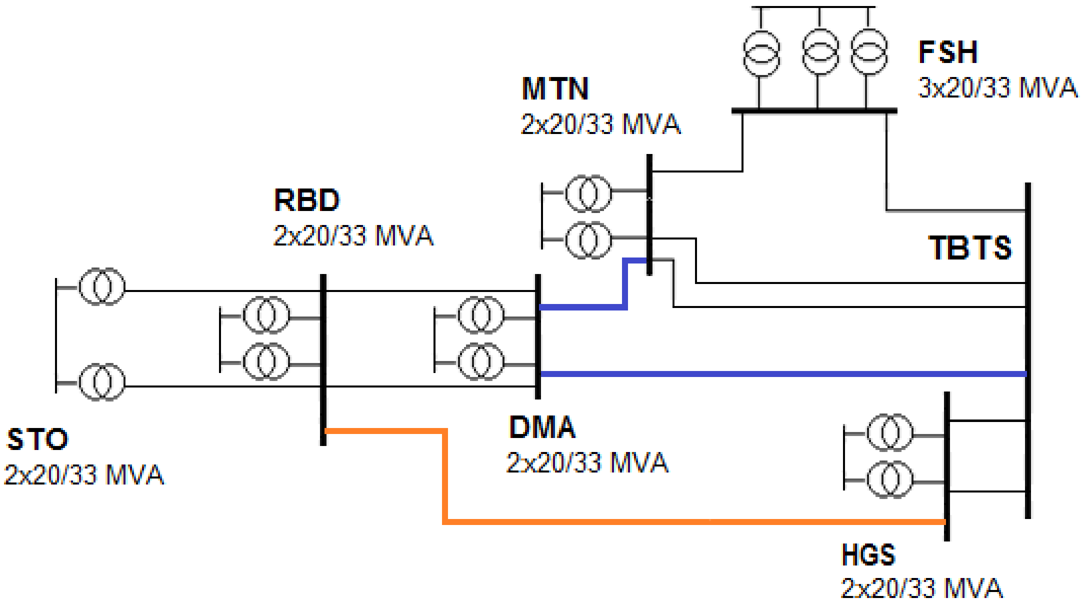


Figure 7 shows the sub-transmission network in the LMP following the construction of the new HGS to RBD line, shown in orange below.

FIGURE 7 SUB-TRANSMISSION NETWORK IN THE MORNINGTON PENINSULA WITH HGS-RBD



Construction of the HGS to RBD line would also covers all other associated equipment, such as new 66kV bays at HGS and RBD, protection and control systems and new fibre optic cable along the route.

The present value of expenditure required under this option and the benefits of improved capacity through the LMP relative to the status quo are described in table 3 below.

TABLE 3 OPTION TWO: BENEFITS ASSESSMENT SUMMARY ($M 2026)

OPTION TWO	PV COSTS	PV BENEFITS	NET BENEFITS
Construct HGS-RBD sub-transmission line	-19.1	22.1	3.0

4.3 Option three: construct HGS-RBD sub-transmission line and new Shoreham zone substation

This option includes development of the same HGS to RBD sub-transmission line described above in option two, and complements it with the construction of a new zone substation in Shoreham.

The construction of a zone substation at Shoreham would halve the length of several feeders supplying the area by providing another point of supply for customers. This would lead to an improvement in the reliability, resilience and the quality of supply for around 8,000 customers.

This option is in line with customer priorities to improve the reliability and resilience across our worst served areas, particularly in areas that are impacted by extreme weather events. The new Shoreham zone substation would deliver more equitable outcomes for customers supplied by our DMA15, DMA23, MTN32 and RBD21 feeders.

Development of the Shoreham zone substation is dependent on construction of the HGS to RBD 66kV sub-transmission line because the Shoreham zone substation will be supplied by the HGS to RBD 66kV line.

Figure 8 below shows the sub-transmission network in the LMP following the construction of the new HGS to RBD line and Shoreham zone substation, shown in orange below.

FIGURE 8 SUB-TRANSMISSION NETWORK IN THE MORNINGTON PENINSULA WITH HGS-RBD AND SHOREHAM ZONE SUBSTATION

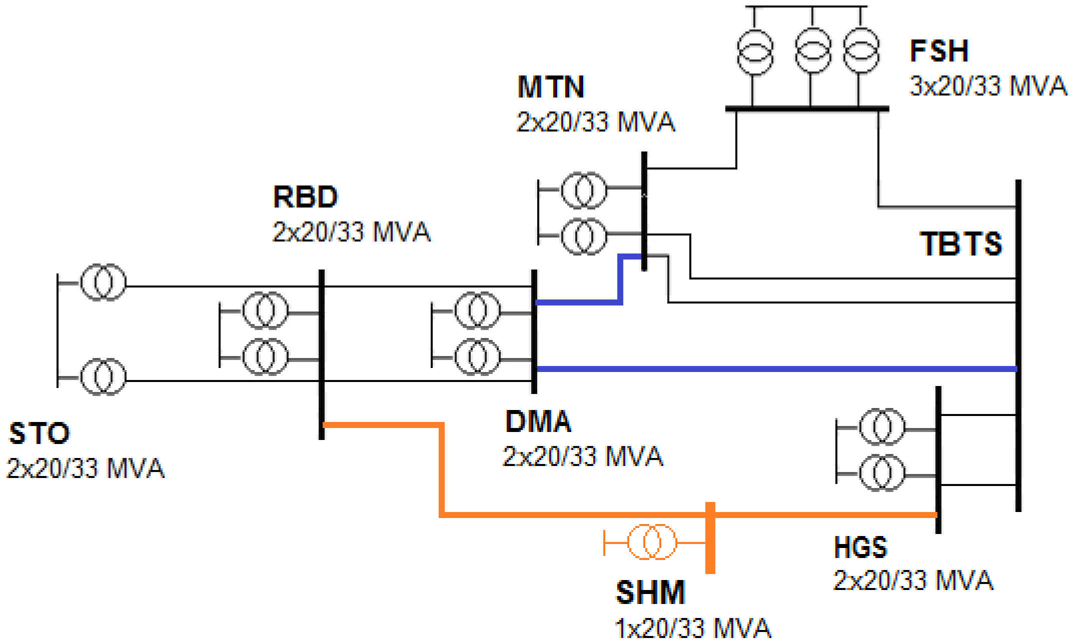
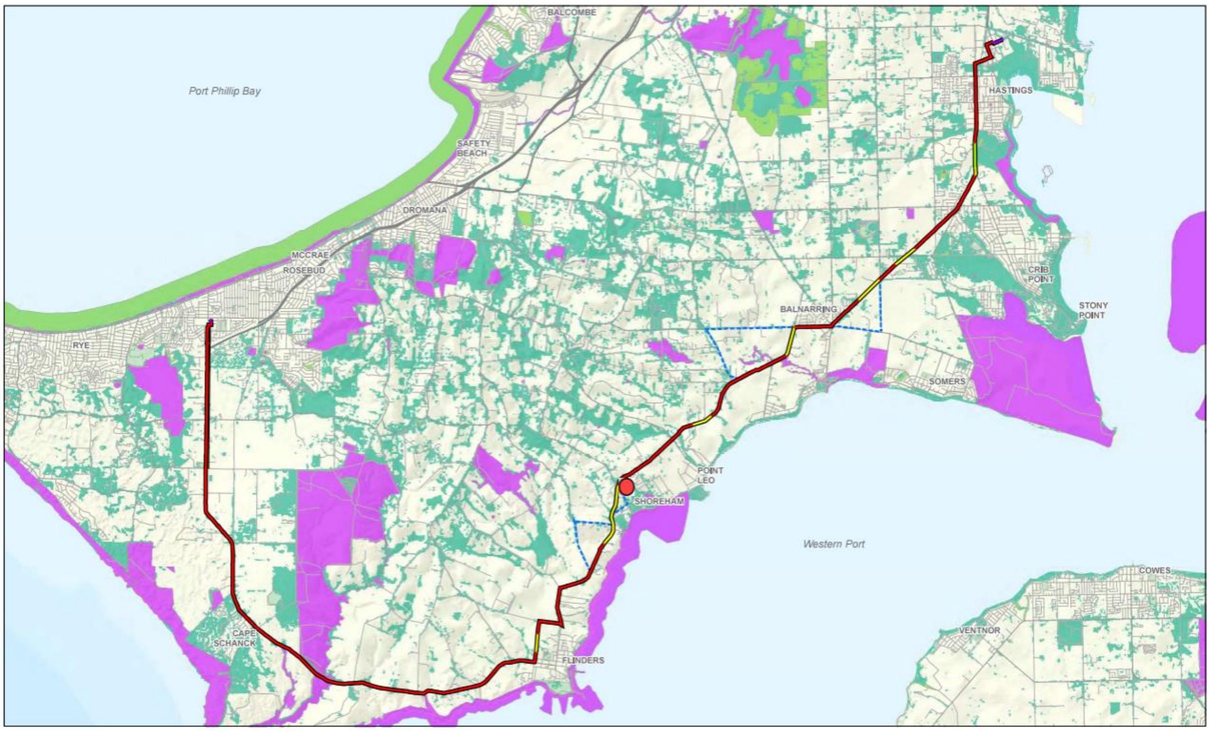


Figure 9 below shows a geographic overlay of the proposed 66kV line route and the Shoreham zone substation roughly halfway along the new line.

FIGURE 9 HGS-RBD PROPOSED LINE ROUTE AND SHOREHAM ZONE SUBSTATION



This option will deliver the benefits outlined in option two while also providing additional resilience benefits for customers in the eastern coastal area of the LMP by reducing feeder length. New feeders will be developed to allow the transfer of load from at-risk feeders, which will reduce the length of each existing feeder and improve reliability for all customers on each feeder.

The present value of expenditure required under this option and the benefits of improved capacity in the LMP relative to the status quo are described in table 4 below.

TABLE 4 OPTION THREE: BENEFITS ASSESSMENT SUMMARY ($M 2026)

OPTION THREE	PV COSTS	PV BENEFITS	NET BENEFITS
Construct HGS-RBD sub-transmission line and new Shoreham zone substation	-31.6	37.6	6.0

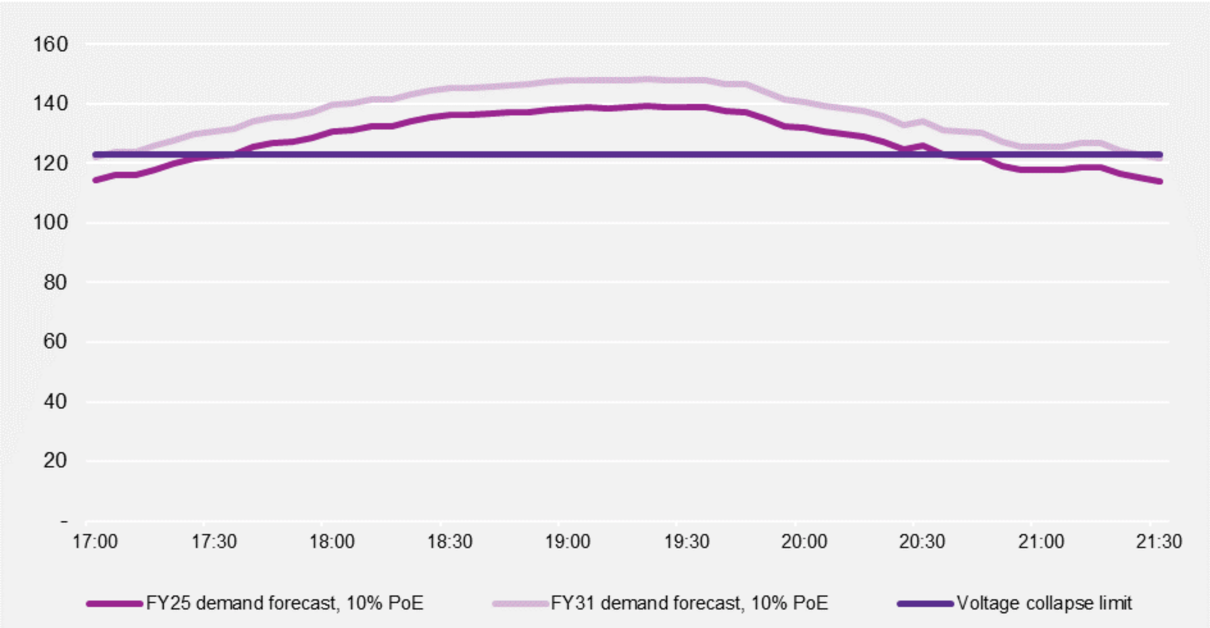
4.4 Option four: expanded non-network solution capability

We currently have an operational non-network solution program across the LMP to defer economic augmentation, described in section 0. Maintaining the current capabilities of this non-network solution does not sufficiently address the identified need.

This option assesses the viability of expanding the capabilities of our non-network solution such that it does address the identified need.

Forecast load growth in the area will impact the scale of response that the non-network solution must provide, characterised by increased capacity that is available for longer durations. Figure 10 shows that a non-network solution will need to provide an additional 10VA of demand response for an additional 90 minutes.

FIGURE 10 FORECAST LOAD INCREASE ON THE LMP(MVA)



Based on existing demand patterns and forecast growth, we expect that the capacity required to be contracted by a non-network solution would need to increase to XX MW. The duration that the non-network solution would be required to operate would also increase from the current 3 hours and 25 minutes to 4 hours and 55 minutes.

Our existing demand management contract ends following the FY25 summer, where renegotiations to continue provision of non-network support would be required thereafter. Given rising fuel costs and other expenses, combined with increasing duration requirements, we are forecasting increasing costs for the provision of a suitably expanded non-network solution over time that would exceed $90,000 per MW of contracted capacity.

The present value of expenditure required to deliver expanded non-network solution capability relative to the status quo are described in table 5 below.

TABLE 5 OPTION FOUR: BENEFITS ASSESSMENT SUMMARY ($M 2026)

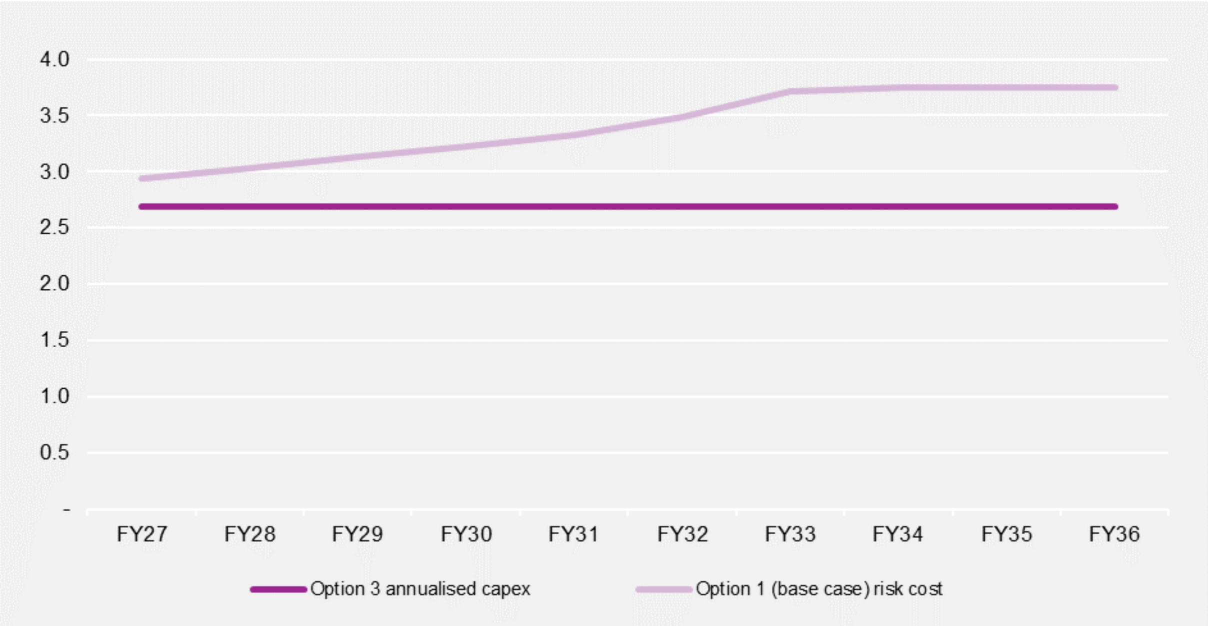
OPTION FOUR	PV COSTS	PV BENEFITS	NET BENEFITS
Expanded non-network solution capability	-5.7	-2.0	-7.7

5. Preferred option

The preferred option for the 2026–31 regulatory period is option three, to construct the new sub-transmission line from HGS to RBD and constructing a new zone substation in Shoreham. This option is preferred because it addresses the identified need and delivers the highest net benefits for customers including improved reliability, access to more capacity to electrify and enhanced resilience against long duration outages.

Given development of the HGS to RBD line is already an economic project that has been successfully deferred using non-network solutions, the optimal timing for option three shows this project is already economic, as shown in Figure 11. This is consistent with our current approach of utilising non-network solutions to defer economic augmentation.

FIGURE 11 TIMING OF PREFERRED OPTION ($M 2026)



However, maintaining the current costs and capabilities of the existing non-network solutions program is not economic because operational costs, such as the price of fuel, continue to increase over time.

A detailed economic assessment, located in our attached cost benefit modelling, shows that the net economic benefits for customers are maximised if this project is commissioned no later than FY31.[3]

Table 6 shows the capital expenditure forecast for the preferred option.

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TABLE 6 EXPENDITURE FORECASTS FOR PREFERRED OPTION ($M 2026)

CAPITAL EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
Construct HGS-RBD sub-transmission line and new Shoreham zone substation	-	-	-	31.6	31.6	63.2

We will continue to publish information on this constraint and project in the Distribution Annual Planning Report (DAPR) and follow our Demand Side Engagement Strategy for this project to ensure that non-network providers are given the opportunity to propose economic solutions that are technically and economically viable.

This project will also be subject to a regulatory investment test for distribution (RIT–D) before the economic timing of the preferred network option to maximise the chance of a viable non-network solution being identified.

5.1 Sensitivity analysis

Sensitivity analysis was undertaken to understand the impact of increasing costs and decreasing the value of energy at risk mitigated on the net economic benefits of each option in different scenarios. Option three provides the highest net economic benefit under all scenarios and remains the preferred option. Further information on our sensitivity analysis can be found in our attached cost benefit modelling.[4]

[4] UE MOD 3.01 - Lower Mornington Peninsula supply area - Jan2025 - Public

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