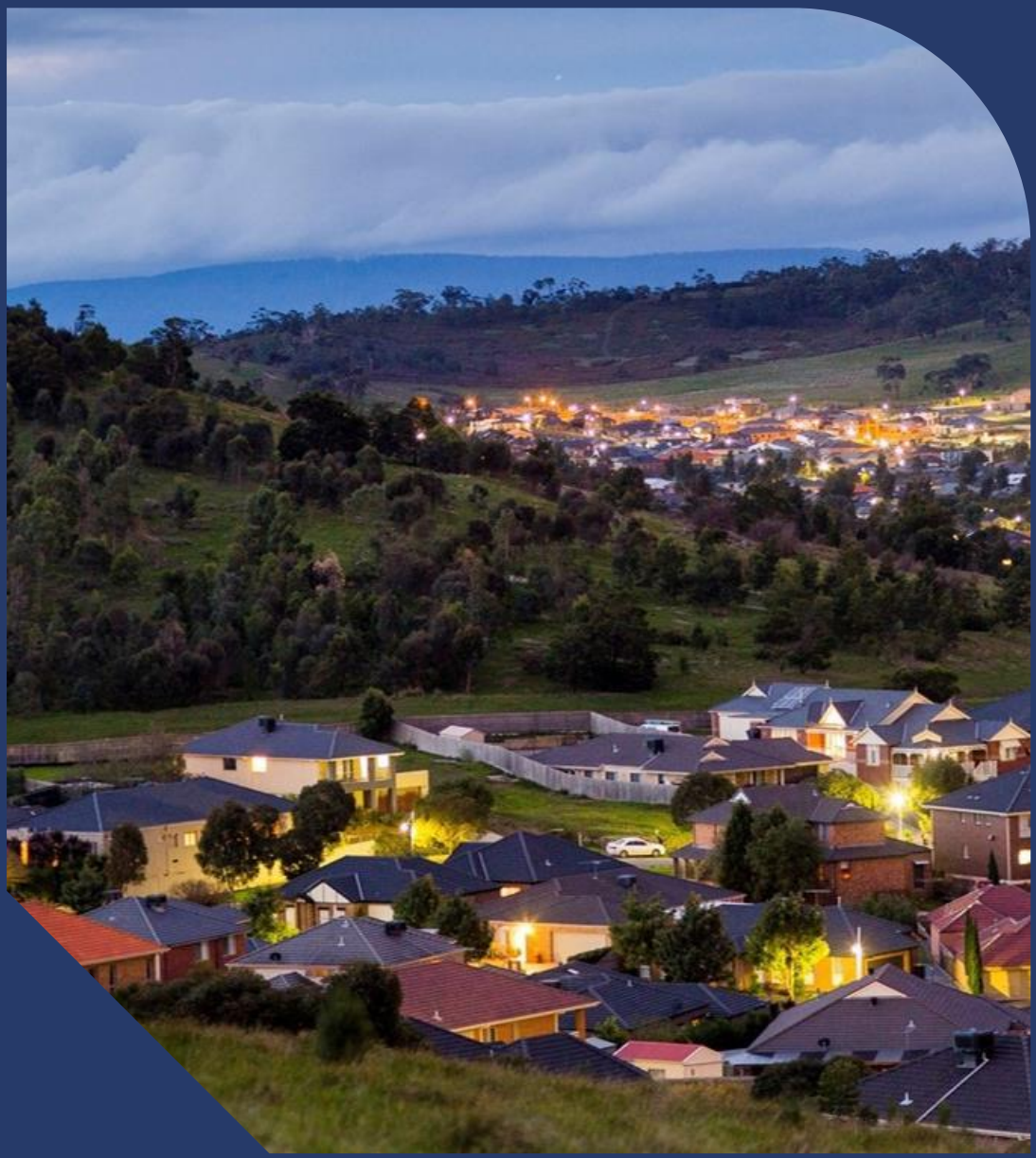
AusNet

Electricity Distribution Price Review FY2027 to FY2031 (EDPR 2027-31)

Business case: MWTS East Stage 2

Date: 31 January 2025



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1. Executive summary

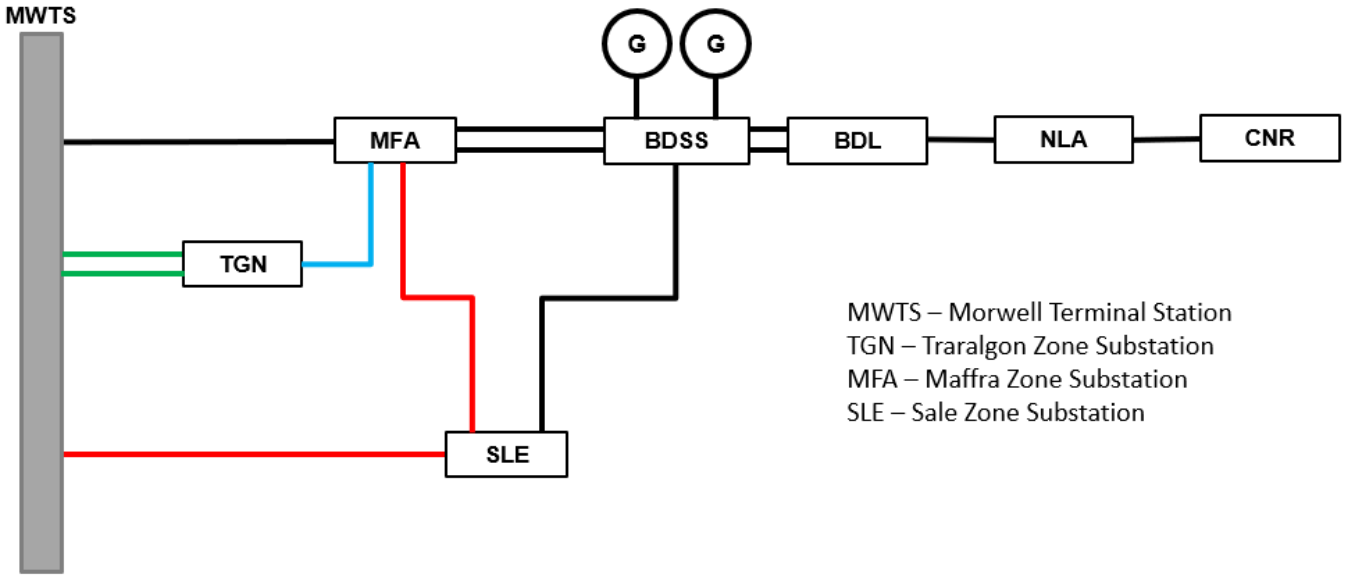
AusNet is a regulated Victorian Distribution Network Service Provider (DNSP) that supplies electrical distribution services to more than 809,000 customers. Our electricity distribution network covers eastern rural Victoria and the fringe of the northern and eastern Melbourne metropolitan area.

AusNet has received connection inquiries to connect a total of 1360 MW of renewable generation to the Morwell East sub-transmission (66 kV) network. The Morwell East sub-transmission network already has 123.1 MW of connected generation. Originally AusNet's sub-transmission network was planned to supply electricity demand, rather than accommodate renewable generation. The Morwell East sub-transmission network was planned, built, and maintained to meet the demand in that area and is not strong enough to connect significant additional renewable generation.

In January 2024, AusNet initiated a project to upgrade MWTS – TGN section (shown in green in the Figure 1) of the Morwell East sub-transmission network. AusNet published the Final Project Assessment Report (FPAR) in November 2024[1]. In this business case, AusNet is proposing a complementary project within the next regulatory period to upgrade TGN – MFA section (shown in blue) to manage growth. As outlined in the Large Renewables Enablement Program document, our proposed EDPR program to unlock sub-transmission capacity for renewable connections only targets projects which can be economically justified by quantifying the customer benefits, which is consistent with the NEO and stakeholder feedback received.

This project is to investigate and evaluate options to address the constraints in the MWTS East sub-transmission network which are restricting new renewable generation connections at SLE.

Figure 1: Morwell East sub-transmission network



AusNet investigated three network options to address the constraints in the MWTS East sub-transmission network which are restricting new renewable generation connections at SLE. All three network options include upgrading MWTS – SLE line summer rating to 100.7 MVA at a modest cost and in addition (Sections shown in red in Figure 1).

Option 1 - Augment existing MFA – SLE line with 19/4.75 AAC conductor (to achieve 100.7 MVA summer rating)

Option 2 – Add new 19/4.75 line in parallel with existing MFA – SLE line (to achieve 101 MVA summer rating)

Option 3 - Augment existing MFA – SLE line with 37/3.75 AAC conductor (to achieve 118 MVA summer rating)

All these network options, except a part of option 2, include augmentation of existing sub-transmission lines hence no new easements are required. Therefore, it is expected that the social licence requirement would be minimal, and the project can be delivered much faster compared to transmission augmentation projects aiming at unlocking renewable generation.

The customer benefits of these sub-transmission line augmentations include:

- reduced electricity generation costs when high-cost fossil fuel generation is replaced by low-cost renewable generation, and reduced curtailment of new low-cost renewable generation
- reduced greenhouse gas emissions, to support achieve NetZero 2050 targets

[1] Connection Enablement: Morwell East Area - Final Project Assessment Report - 26 November 2024

- reduced supply risk costs and safety risk costs when old lines are replaced with new high-capacity lines.

AusNet evaluated the three credible network options and found that Option 1 delivers the highest net economic benefits. The robustness of the option evaluation was investigated through sensitivity analysis that involved variations of the discount rate and the option cost around the values used in the central case. Table 1 summarise the evaluation results.

Table 1: Project Summary ($m, undiscounted, 2024 dollars)

	FY27 to FY31			Full assessment period	
	Capex	Opex	Total cost	Total cost	Total benefits
Do nothing	0	0	0	0	0
Option 1 – Augment existing MFA – SLE line with 19/4.75 AAC conductor	13.66	0	13.66	13.66	65.33
Option 2 – Add new 19/4.75 line in parallel with existing MFA – SLE line	28.44	0	28.44	28.44	0.58
Option 3 – Augment existing MFA – SLE line with 37/3.75 AAC conductor	13.77	0	13.77	13.77	25.72

Table 2: Project Summary ($m, discounted, 2024 dollars)

	FY27 to FY31			Full assessment period			Comments
	Capex	Opex	Total cost	Total cost	Total benefits	NPV	
Do nothing	0	0	0	0	0	0	Base case for comparison
Option 1 – Augment existing MFA – SLE line with 19/4.75 AAC conductor	9.35	0	9.35	9.35	35.26	25.91	This is the preferred option as it maximises the NPV, and a technically feasible problem
Option 2 – Add new 19/4.75 line in parallel with existing MFA – SLE line	19.5	0	19.5	19.5	1.31	-18.16	
Option 3 – Augment existing MFA – SLE line with 37/3.75 AAC conductor	9.43	0	9.43	9.43	14.20	4.78	

Source: AusNet analysis

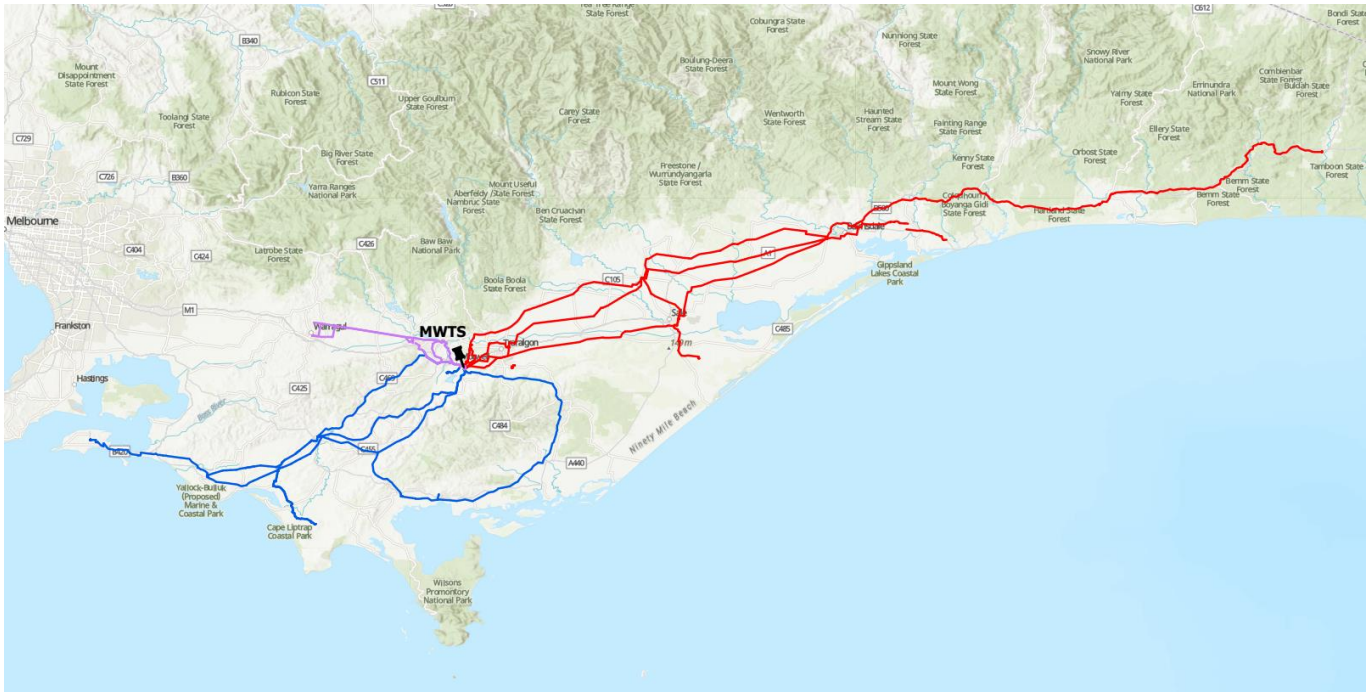
On basis of the analysis presented in this report, AusNet concludes that Option 1 "Augment existing MFA – SLE line with 19/4.75 AAC conductor (in addition to upgrading MWTS – SLE line summer rating to 100.7 MVA)" is the preferred option to address the identified need of this project.

2. Background

Morwell Terminal Station (MWTS) 66 kV is the main source of supply for a major part of south-eastern Victoria including Gippsland. AusNet is responsible for planning the transmission connection and distribution network assets for this region.

MWTS 66 kV is supplied by two 150 MVA 220/66 kV transformers and one 165 MVA 220/66 kV transformer. Maximum demand at MWTS 66 kV typically occurs in summer. The station recorded a maximum demand of 452 MW (464 MVA) in early January 2013. The maximum demand on the station reached 422.3 MW (425 MVA) in winter 2022. The maximum demand period is usually quite short and coincides with a few weeks of peak tourism from Christmas to early January along the east coast of Victoria – however driven by unusually cool 2022/2023 summer conditions the maximum demand occurred in winter 2022. The maximum demand at MWTS 66 kV is forecast to increase over the ten-year planning horizon, partially driven by electrification.

Figure 2: Map showing Morwell Terminal Station and the Morwell sub-transmission network



Source: AusNet analysis

Morwell East network (shown in red) supplies Omeo in the north and Bairnsdale and Mallacoota in the east. Morwell South (shown in blue) supplies Phillip Island, Wonthaggi and Leongatha.

As of October 2023, there is a total of 523.7 MW of embedded generation capacity installed on the AusNet sub-transmission and distribution networks connected to MWTS[2]. It consists of:

- 277.4 MW of large-scale embedded generation; and
- 246.3 MW of rooftop solar PV, including all the residential and small-scale commercial rooftop PV systems that are smaller than 1 MW.

Of this connected generation to MWTS, Morwell East network has 123.1 MW of large-scale connected generation.

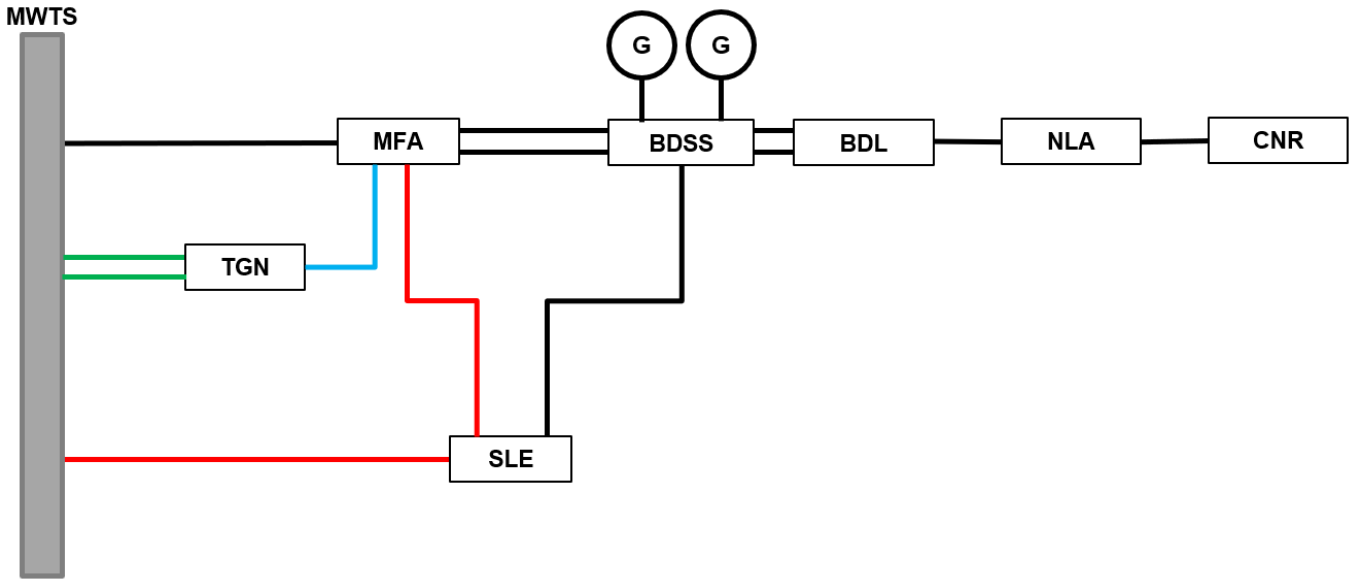
[2] 2023 Transmission Connection Planning Report (TCPR)

3. Identified need

As mentioned above, there is already 123.1 MW of large-scale embedded generation connected to Morwell East network. AusNet has received connection inquiries to connect a total of 1360 MW of renewable generation to Morwell East sub-transmission (66 kV) system, including a 77 MW solar farm which is at the committed stage between MWTS - MFA and an 80 MW solar farm in advanced stage between MWTS – SLE.

The East Gippsland 66 kV network, which emanates from Morwell Terminal Station (MWTS), supplies over 71,200 customers via six AusNet zone substations, including Traralgon (TGN), Sale (SLE), Maffra (MFA), Bairnsdale (BDL), Newmerella (NLA) and Cann River (CNR)[3].

Figure 3: Morwell East sub-transmission network



AusNet commenced a RIT-D and published the Final Project Assessment Report (FPAR) in November 2024 to augment MWTS-TGN section (two lines in green) to accommodate more renewable energy at TGN. AusNet is also proposing augmentation of TGN-MFA (line in blue) in the next EDPR period.

Through preliminary studies AusNet found that only a portion of the proposed generation connections could be accommodated by the existing assets, and the output of the connected generation would have to be curtailed during peak generation due to the existing constraints of the network. After MWTS – TGN and TGN – MFA augmentations, MWTS – SLE – MFA sections (lines in red) become the constraining elements to accommodate more renewable generation to the Morwell East network.

The identified need of this project is therefore to address the constraints between MWTS – SLE - MFA sub-transmission section to enable more renewable generation to connect to AusNet's sub-transmission and distribution network in Morwell East network.

3.1. Key inputs and assumptions

The identified need described in the previous section is underpinned by a number of assumptions, including the projected growth in renewable generation given the connection inquiries received; the risk of asset failure (determined by the condition of the assets); and the likelihood of the relevant consequences. The project capex is based on the budget estimates received (with +/- 30% accuracy).

3.1.1. Market impact costs

Market models produce three key values for assessing net economic benefits:

[3] AusNet Distribution Annual Planning Report (DAPR) – 2024-2028

- savings in total generation costs when new low-cost generation is introduced;
- curtailment of new low-cost generation; and
- savings in total generation costs when a network augmentation is introduced to reduce curtailment.

To determine whether enabling new generation connections is beneficial to electricity consumers as a whole, compared to the case without new generation:

- the sum of capital expenditure for the new generation and NEM-wide generation operating costs must be lower;
- curtailment of existing and new generation must be within bounds that are reasonably acceptable for generation proponents; and
- the capital cost of network augmentation must be lower than the savings developed by introducing the new generation.

Adhering to these three determinants leads to a future generation and transmission mix that reduces total costs to consumers. AusNet undertakes market modelling to assess hosting capacity, with and without the proposed augmentation. The assessment is performed using time-sequential modelling that takes account of:

- Projected changes in demand, with specific components that track potential growth in rooftop solar systems, electric vehicle penetration and charging habits, domestic and commercial battery installations, demand-side participation, and virtual power plant schemes utilizing aggregated batteries and vehicle-to-grid technologies.
- Addition of new transmission-connected generators and retirement of existing ageing generators according to AEMO's latest-available ISP projections.
- Addition of new interconnector projects according to AEMO's ISP projections.
- Projected changes in fuel costs for coal and gas-fired generators.
- Projected changes in fixed and variable generator operating costs, maintenance cycles and unplanned outages.
- National Electricity Market Dispatch Engine (NEMDE) constraint equations for regions outside Victoria.
- NEMDE constraint equations for electricity system stability in Victoria.
- Secure thermal operation under N-1 contingency conditions within Victoria, with reference to future changes in power flow.
- Multiple macroeconomic growth scenarios according to AEMO's latest-available Input Assumptions and Scenarios Report (IASR).
- Federal and State-based targets for renewable energy and emissions reduction.

Modelling is performed using hourly time intervals over multiple years to develop a long-term view that aligns with the operational lifetime of generation and transmission assets.

3.1.2. Emission reduction costs

Greenhouse gas emissions would be reduced by replacing fossil fuel powered generation with renewable generation. AusNet quantified the benefits from reductions in carbon emissions using the cost of carbon as given in the guidance published by the AER[4].

3.1.3. Supply risk costs

In calculating the supply risk costs, AusNet estimates the expected unserved energy based on the most recent demand forecasts, and values this expected unserved energy with the latest AER Value of Customer Reliability (VCR)[5]. The VCR value applied is based on the sector values published by the AER and the composition of load, by sector, supplied from MWTS. The resulting estimate of the weighted VCR for affected customers is $44,100/MWh for MWTS 66 kV.

The total supply risk cost is calculated by estimating the impacts of different combinations of relevant forced outages to reliability of supply and weighting them by their probabilities of occurrence.

3.1.4. Safety risk costs

[4] Valuing emissions reduction AER guidance and explanatory statement – May 2024
[5] In dollar terms, the Value of Customer Reliability (VCR) represents a customer's willingness to pay for the reliable supply of electricity. The values produced are used as a proxy, and can be applied for use in revenue regulation, planning, and operational purposes in the National Electricity Market (NEM).

The Electricity Safety Act 1998[6] requires AusNet to design, construct, operate, maintain, and decommission its network to minimise hazards and risks to the safety of any person as far as reasonably practicable or until the costs become disproportionate to the benefits from managing those risks. By implementing this principle for assessing safety risks from asset failures, AusNet uses:

- a value of statistical life[7] to estimate the benefits of reducing the risk of death;
- a value of lost time injury[8]; and
- a disproportionality factor[9].

AusNet's approach, including the use of a disproportionality factor, is consistent with the guidance provided by the AER.

3.1.5. Financial risk costs

In the event of an asset failure, costs will be incurred in replacing the failed assets (and any consequential damage to other assets). The risk of this financial impact may vary for different credible options and, therefore, should be factored into the cost-benefit assessment.

[6] Victorian State Government, Victorian Legislation and Parliamentary Documents, "*Electricity Safety Act 1998,*" available at Electricity Safety Act 1998 (legislation.vic.gov.au)
[7] Department of the Prime Minister and Cabinet, Australian Government, "*Best Practice Regulation Guidance Note: Value of statistical life,*" available at https://www.pmc.gov.au/resource-centre/regulation/best-practice-regulation-guidance-note-value-statistical-life
[8] Safe Work Australia, "The Cost of Work-related Injury and Illness for Australian Employers, Workers and the Community: 2012-13," available at https://www.safeworkaustralia.gov.au/system/files/documents/1702/cost-of-work-related-injury-and-disease-2012-13.docx.pdf
[9] Health and Safety Executive's submission to the1987 Sizewell B Inquiry suggesting that a factor of up to 3 (i.e., costs three times larger than benefits) would apply for risks to workers; for low risks to members of the public a factor of 2, for high risks a factor of 10. The Sizewell B Inquiry was public inquiry conducted between January 1983 and March 1985 into a proposal to construct a nuclear power station in the UK.

4. Options assessed

This section describes the credible options that have been considered to address the identified need, including:

- the technical characteristics of each option;
- the estimated construction timetable; and
- the total indicative capital and operating and maintenance costs.

The purpose of the evaluation is to identify the credible option for addressing the identified need that maximises the net market benefit. An important aspect of this task is to consider non-network and network options on an equal footing, so that the optimal solution can be identified, evaluated and determined.

AusNet identified three credible network options to address the identified need:

1. Option 1: MWTS – SLE upgrade and augment existing MFA – SLE line with 19/4.75 AAC conductor

2. Option 2: MWTS – SLE upgrade and add new 19/4.75 line in parallel with existing MFA – SLE line

3. Option 3: MWTS – SLE upgrade and augment existing MFA – SLE line with 37/3.75 AAC conductor

All these network options are discussed in detail below, including the Do Nothing/BAU option. AusNet found no suitable economically viable non-network option. However, a RIT-D would be undertaken for this project and non-network option options would be invited and evaluated if proposed.

4.1. Assessment approach

AusNet undertook a cost-benefit analysis to evaluate and rank the net economic benefits of the credible options over a 45-year period.

All options considered has been assessed against a business-as-usual case or base case where no proactive capital investment to address the identified need is made.

All three options assessed include either replacing an existing asset or adding a new line to augment the network. This would increase the reliability of the sub-transmission network. However, due to the meshed nature of the sub-transmission network, the reliability improvement benefits of these options are minor compared with the market benefits and emission reduction benefits and hence assumed negligible for the assessment.

Furthermore, replacement of old assets when augmenting the existing assets would reduce the operation and maintenance (O & M) costs. These are of lower order compared with the augmentation capex and hence assumed negligible for the assessment.

For this project, there is a significant market benefit component, which is addressed by the market modelling, as described in section 3.1.1. Specifically, the reduction in wholesale energy costs that arise from the augmentation is a key factor in the cost benefit analysis. AusNet's approach to emission reduction cost calculation is described in section 3.1.2. The preferred option is the one that delivers the lowest total cost to customers, which is the sum of the cost of implementing that option and any residual risk-cost.

In applying sensitivities to our cost benefit assessment, we have regard to the different circumstances that may eventuate that would affect the choice of the preferred option.

Table 3 below lists the key variables and assumptions applied in the economic assessment, which are essential inputs to our methodology for the purpose of this assessment.

Table 3: Key assumptions

	Value	Comments
WACC	5.56%	Advised WACC rate to use
Evaluation period	45 years	Average lines asset life is more than 45 years
Value of Customer Reliability	$44,100/MWh	2023 TCPR (Transmission Connection Planning Report)
Cost of Carbon		The draft guidance published by the AER in March 2024

Source: AusNet analysis

4.2. Do nothing

The Do Nothing/BAU (Business as Usual) option assumes that AusNet would not undertake any investment, outside of the normal operational and maintenance processes. The Do Nothing/BAU (Business as Usual) option establishes the base level of risk (base case) and provides a basis for comparing other credible options. All other credible options would be assessed comparing with the Do Noting option. Hence, it is assumed that this option has no capex or opex and would include no benefits. In this option AusNet would continue with the existing MFA – SLE summer rating of 49.73 MVA and MWTS – SLE summer rating of 90.31 MVA.

4.3. Option 1: Augment existing MFA – SLE line with 19/4.75 AAC conductor

The existing MFA – SLE line summer rating is 49.73 MVA and MWTS – SLE summer rating is 90.31 MVA. This option includes upgrading the MWTS – SLE line section to achieve summer rating of 100.7 MVA with a modest capex of $1.14M. In addition, this option plans to augment the existing MFA – SLE line with 19/4.75 AAC conductor. This augmentation will increase the summer rating of MFA – SLE section from 49.73 MVA to 105 MVA. The capex of this MFA - SLE augmentation is $12,52M. This option would not require new easements as it involves augmentation of existing lines. Hence the social licencing requirement would be minimum resulting fast project implementation.

It is planned to deliver both these line upgrades in an integrated project to achieve delivery efficiency. The project is expected to commence design in 2026-27 after the RIT-D and delivery completed by 2030.

4.3.1. Summary

The assessment of credible options demonstrated option I as the most economic option. This option has the lowest cost of all the option considered and provides highest market and emission reduction benefits. It is expected that the project could be completed, and benefits commence realising from FY31 onwards. Option 1 provides a Net Present Value (NPV) of $25.91 million under the central scenario and provides positive benefits in all other scenarios considered.

Table 4: Option 1 Summary ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Cost	0.16	1.79	5.08	3.08	3.06	**13.17**	13.66
Benefits	0	0	0	0	8.48	8.48	65.33

Table 5: Option 1 Summary ($m, discounted, 2024 dollars)

	Full assessment period
Cost	9.35
Benefits	35.26
NPV, Benefits	25.91

Source: AusNet analysis

4.3.2. Cost

4.3.2.1. Capex

The capex of MWTS – SLE upgrade is $1.14M and the capex of MFA - SLE upgrade is $12.52M. This option includes upgrading both MWTS – SLE and MFA – SLE sections in an integrated project. The total capex of the integrated project is $13.66M.

Table 6: Option 1 Capex ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Capex	0.16	1.79	5.08	3.08	3.06	**13.17**	13.66

Source: AusNet analysis

4.3.2.2. Opex

AusNet does not expect this option to have a material impact on future O&M costs. This option would have marginal opex savings compared with the Do Nothing option due to replacement of old line assets with new assets. Hence, for the economic evaluation of the options the opex change is considered to be negligible.

4.3.3. Benefits

Table 7: Option 1 Net Benefits ($m, discounted, 2024 dollars)

	Full assessment period
	Discounted
Generation dispatch benefits	9.27
Emission reduction benefits	25.99
Total benefits	35.26

Source: AusNet analysis

There would be some reliability improvement benefits due to reduced asset failures and reduced safety risk benefits due to old existing line assets replaced by new assets when the existing line is augmented with a high-capacity conductor. However, these benefits are expected to be relatively low compared with market benefits and emission reduction benefits and hence not considered for the evaluation.

4.4. Option 2: Add new 19/4.75 line in parallel with existing MFA – SLE line

The existing MFA – SLE line summer rating is 49.73 MVA and MWTS – SLE summer rating is 90.31 MVA. This option includes upgrading the MWTS – SLE line section to achieve summer rating of 100.7 MVA with a modest capex of $1.14M. In addition, this option plans to add a new line with 19/4.75 AAC conductor to the existing MFA – SLE line to operate in parallel. This augmentation will increase the overall summer rating of MFA – SLE section from 49.73 MVA to 101 MVA. The capex of this MFA - SLE augmentation is $27.3,52M. This option needs new easements to build the new line but would reduce the outage requirement of the existing line during the project implementation phase.

It is planned to deliver both these line upgrades in an integrated project to achieve delivery efficiency. The project is expected to commence design in 2026-27 after the RIT-D and delivery completed by 2030.

4.4.1. Summary

In option 2, the new 19/4.75 AAC line will operate in parallel with the existing line having a lower capacity. This would limit the overall capacity between MFA – SLE. This option has the highest cost of all the credible options considered. It is assumed that the project could be completed, and benefits commence realising from FY31 onwards. Option 2 provides a negative Net Present Value (- $18.16) million under the central scenario and provides negative NPV values in all the scenarios considered.

Table 8: Option 2 Summary ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Cost	0.35	3.80	10.78	6.54	6.48	**27.95**	**28.44**
Benefits	0	0	0	0	4.12	4.12	0.58

Table 9: Option 2 Summary ($m, discounted, 2024 dollars)

	Full assessment period
Cost	19.47
Benefits	1.31
NPV, Benefits	-18.16

Source: AusNet analysis

4.4.2. Cost

4.4.2.1. Capex

The capex of MWTS – SLE upgrade is $1.14M and the capex of MFA - SLE upgrade is $27.3M. This option includes upgrading both MWTS – SLE and MFA – SLE sections in an integrated project. The total capex of the integrated project is $28.44M.

Table 10: Option 2 Capex ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Capex	0.35	3.80	10.78	6.54	6.48	**27.95**	**28.44**

Source: AusNet analysis

4.4.2.2. Opex

AusNet does not expect this option to have a material impact on future O&M costs. This option would have marginal opex increase compared with the Do Nothing option due to addition of a new line with the existing SLE – MFA line. However, the opex increase would be negligible compared with the capex and project benefits and hence was not considered for the economic evaluation of the options.

4.4.3. Benefits

Table 11 Option 2 Net Benefits ($m, discounted, 2024 dollars)

	Full assessment period
	Discounted
Generation dispatch benefits	-0.48
Emission reduction benefits	1.79
Total benefits	1.31

Source: AusNet analysis

There would be some reliability improvement benefits due to reduced asset failures and reduced safety risk benefits due to old existing line assets replaced by new assets when the existing line is augmented with a high-capacity conductor. However, these benefits are expected to be relatively low compared with market benefits and emission reduction benefits and hence not considered for the evaluation.

4.5. Option 3: Augment existing MFA – SLE line with 37/3.75 AAC conductor

The existing MFA – SLE line summer rating is 49.73 MVA and MWTS – SLE summer rating is 90.31 MVA. This option includes upgrading the MWTS – SLE line section to achieve summer rating of 100.7 MVA with a modest capex of $1.14M. In addition, this option plans to augment the existing MFA – SLE line with 37/3.75 AAC conductor. This augmentation will increase the summer rating of MFA – SLE section from 49.73 MVA to 118 MVA. The capex of this MFA - SLE augmentation is $12,63M. This option would not require new easements as it involves augmentation of existing lines. Hence the social licencing requirement would be minimum resulting fast project implementation.

It is planned to deliver both these line upgrades in an integrated project to achieve delivery efficiency. The project is expected to commence design in 2026-27 after the RIT-D and delivery completed by 2030.

4.5.1. Summary

The assessment of credible options demonstrated option 3 provides a positive NPV for all the scenarios considered. It is expected that the project could be completed, and benefits commence realising from FY31 onwards. Option 3 provides a Net Present Value (NPV) of $4.78 million under the central scenario but is lower than that of Option 1. For all the scenarios considered option 3 NPVs are lower than option 1 NPVs.

Table 12: Option 3 Summary ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Cost	0.17	1.80	5.12	3.11	3.08	**13.28**	**13.77**
Benefits	0	0	0	0	4.66	**4.66**	25.72

Table 13: Option 3 Summary ($m, discounted, 2024 dollars)

	Full assessment period
Cost	9.43
Benefits	14.20
NPV	4.78

Source: AusNet analysis

4.5.2. Cost

4.5.2.1. Capex

The capex of MWTS – SLE upgrade is $1.14M and the capex of MFA - SLE upgrade is $12.63M. This option includes upgrading both MWTS – SLE and MFA – SLE sections in an integrated project. The total capex of the integrated project is $13.77M.

Table 14: Option 3 Capex ($m, undiscounted, 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period
Capex	0.17	1.80	5.12	3.11	3.08	**13.28**	**13.77**

Source: AusNet analysis

4.5.2.2. Opex

AusNet does not expect this option to have a material impact on future O&M costs. This option would have marginal opex savings compared with the Do Nothing option due to replacement of old line assets with new assets. Hence, for the economic evaluation of the options the opex change is considered to be negligible.

4.5.3. Benefits

Table 15: Option 3 Net Benefits ($m, discounted, 2024 dollars)

	Full assessment period
	Discounted
Generation dispatch benefits	3.06
Emission reduction benefits	11.14
Total benefits	14.20

Source: AusNet analysis

There would be some reliability improvement benefits due to reduced asset failures and reduced safety risk benefits due to old existing line assets replaced by new assets when the existing line is augmented with a high-capacity conductor. However, these benefits are expected to be relatively low compared with market benefits and emission reduction benefits and hence not considered for the evaluation.

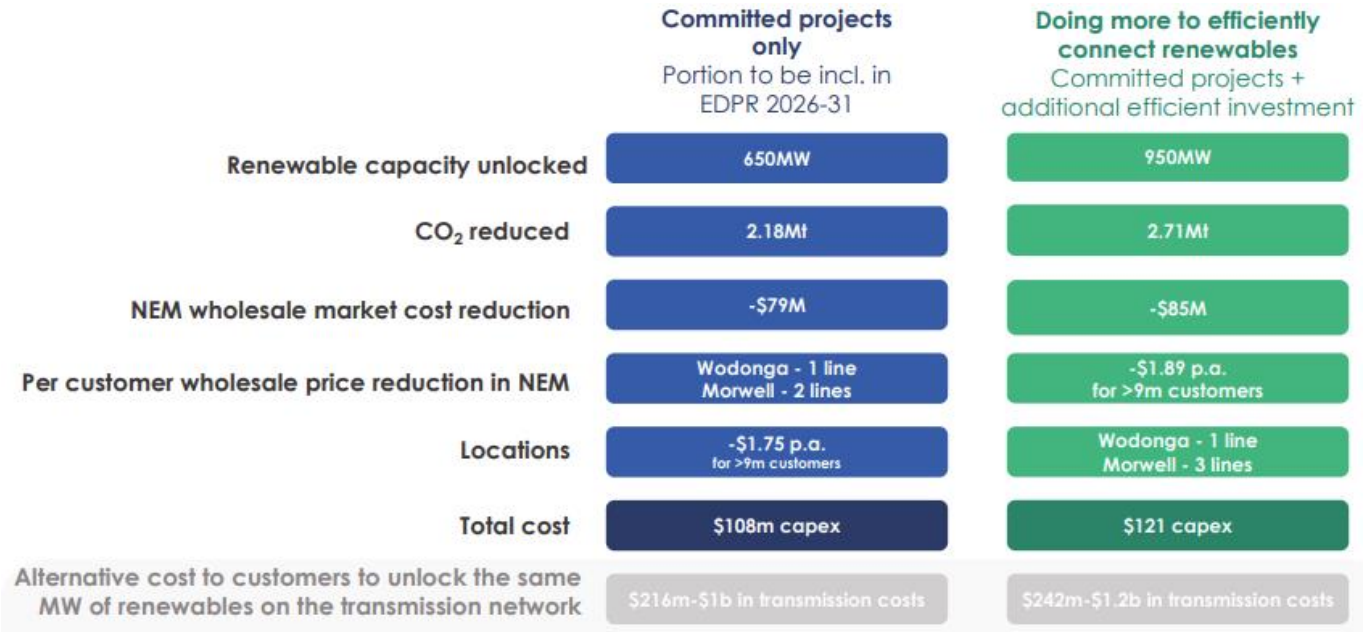
5. Customer insights

We discussed the value of networks unlocking more capacity for larger renewable generation in the sub-transmission network primarily with our Future Networks Panel. The Panel were pleased to see AusNet looking for opportunities to efficiently unlock more renewable generation and leveraging existing network capacity, rather than relying solely on transmission upgrades, as has traditionally been the case.

We have taken this into account in designing our proposal for large renewable generation. Our proposal is to unlock capacity in our sub-transmission network for renewable generation and storage, in areas where the benefit of those investments outweighs the cost. All Victorian and NEM customers benefit from this investment through lower wholesale energy prices, as more renewable energy is unlocked.

We explained two potential investment options under this approach with our EDPR stakeholders at an all-Panel discussion at our August 2024 offsite. The options are shown in Figure 4 below with project in this business case represents the difference between the "do more" option and our lower investment option.

Figure 4: Two investment options presented to EDPR stakeholders for trade-offs discussion, August 2024



Initially the Future Networks Panel was unable to agree unanimously on an outcome. The broader group voted to "do more" to efficiently connect renewables (higher investment option), on the basis that it would lower overall costs of the system compared to deferring large renewables to the transmission system or connecting generators paying the whole cost of connecting without coordinated planning.

6. Preferred option and sensitivity testing

AusNet identified three credible network options to address the identified need. All three network options include upgrading MWTS – SLE line summer rating to 100.7 MVA at a modest cost and in addition:

Option 1 - Augment existing MFA – SLE line with 19/4.75 AAC conductor,

Option 2 – Add new 19/4.75 line in parallel with existing MFA – SLE line, and

Option 3 - Augment existing MFA – SLE line with 37/3.75 AAC conductor

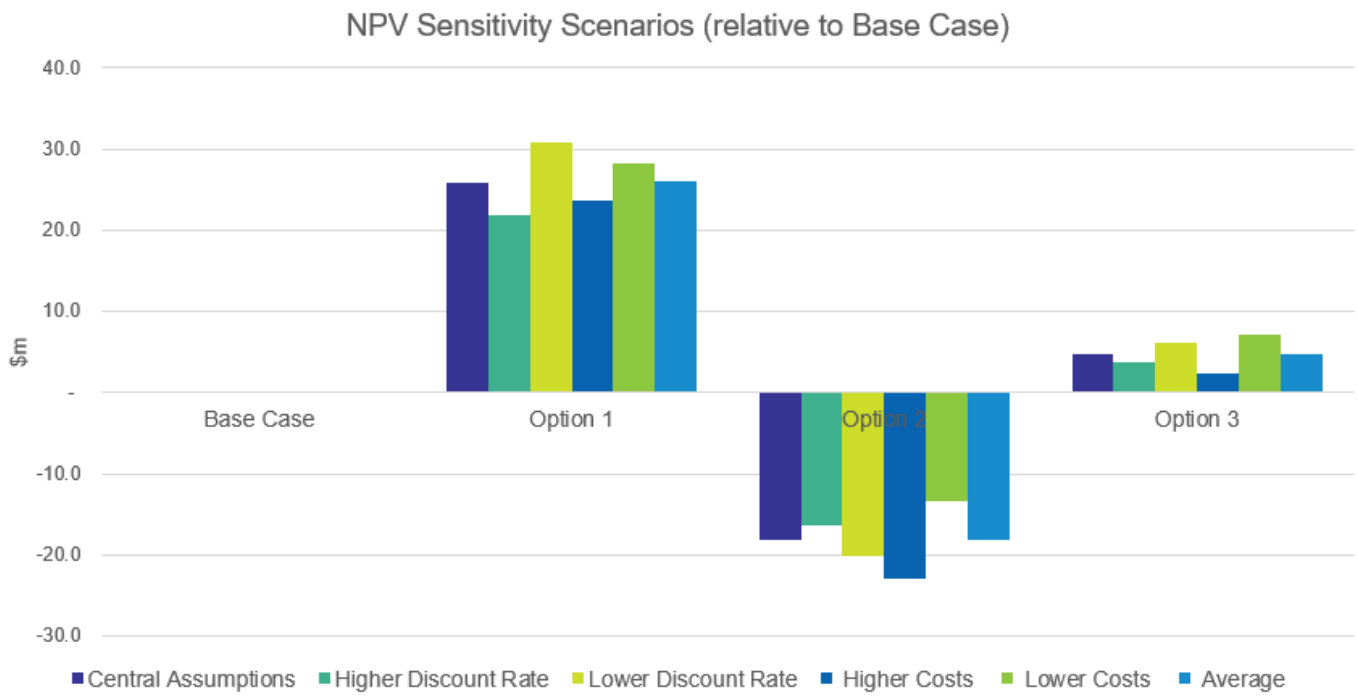
Under the central scenario, the option 1 provided the highest NPV. The robustness of the option evaluation was investigated through sensitivity analysis that involve variations of inputs around the values used in the base case. The following variations were tested, and the results are given in 6.

Table 16: Variations of inputs used for sensitivity testing

	Central	Higher	Lower
Discount Rate	5.56%	7.00%	4.11%
Project cost	100%	125%	75%

For all the sensitivities tested, option 1 and option 3 provided positive NPV, with a higher net economic benefits for option 1 than option 3. Option 2 provided negative NPV for all the scenarios considered.

Figure 5: Sensitivity Testing Results



Source: AusNet analysis

On basis of the analysis presented in this report, AusNet concludes that the option 1 "Augment existing MFA – SLE line with 19/4.75 AAC conductor (in addition to upgrading MWTS – SLE line summer rating to 100.7 MVA)" is the preferred option to address the identified need of this project.

Table 17: Net Present Value ($m, 2024 dollars)

	Central assumptions	Higher WACC	10% increase in capex	Comments
Do nothing	-	-	-	
Option 1 – Augment existing MFA – SLE line with 19/4.75 AAC conductor	25.91	21.83	23.57	This is the preferred option under all scenarios
Option 2 – Add new 19/4.75 line in parallel with existing MFA – SLE line	-18.16	-16.35	-23.03	Provides negative NPV under all scenarios
Option 3 – Augment existing MFA – SLE line with 37/3.75 AAC conductor	4.78	3.73	2.42	Provides lower NPV than the preferred option under all scenarios

Source: AusNet analysis