

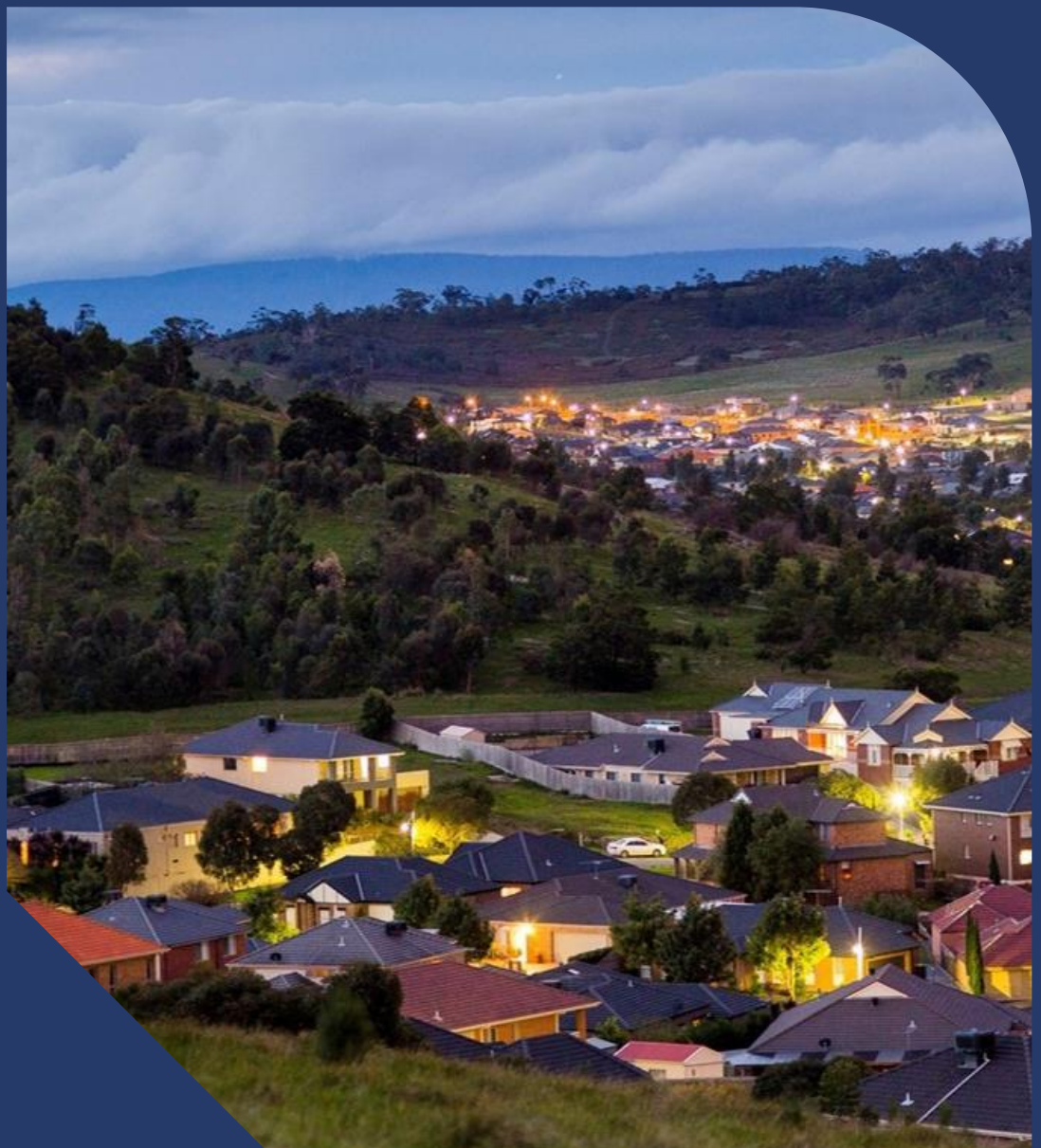
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## Secure supply and enable connections: South Morang 66 kV Loop

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Regulatory Investment Test for Distribution (RIT-D)  
Options Screening Report

Thursday, 2 April 2026



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# 1. Executive summary

AusNet is a regulated Victorian electricity distribution network service provider (**DNSP**) that provides electricity distribution services to more than 845,000 customers. Our electricity distribution network covers eastern regional Victoria and the outer northern and eastern Melbourne metropolitan areas.

The regulatory investment test for distribution (**RIT-D**) is an economic cost-benefit assessment and consultation process designed to identify the credible option for an identified need on the electricity network, that maximises net economic benefits for stakeholders in the national electricity market (**NEM**) – the preferred option.

AusNet (the RIT-D proponent) has initiated this RIT-D to identify the preferred option to address the capacity limitations within the South Morang 66 kV sub-transmission loop.

## Identified need

The North Growth Corridor (**NGC**)<sup>1</sup> on the urban fringes of Melbourne's northern suburbs is a vast greenfield development area contributing significantly to Melbourne's population and economic growth. The NGC is supplied in part by AusNet's existing zone substations: Kalkallo (**KLO**), Doreen (**DRN**), and Epping (**EPG**), through a network of 22 kV distribution feeders. KLO, which sits at the centre of the corridor, supplies over 22,800 AusNet customers and over 13,448 Jemena Electricity Network (**JEN**) customers.

Population growth within the NGC has accelerated rapidly over recent years, placing increasing pressure on AusNet's existing South Morang 66 kV sub-transmission loop in the area. Beveridge and Wollert are experiencing the fastest population growth, with Beveridge increasing from 1,874 residents in 2016 to 4,642 in 2021 (~20% annual growth) and Wollert growing from 9,060 to 24,407 over the same period (~22% annual growth).

Broader government forecasts reinforce this trajectory. Victoria's Department of Transport and Planning (**VIF2023**)<sup>2</sup> projects the Mitchell local government area (**LGA**), containing Beveridge, to increase from 49,710 in 2021 to 119,830 in 2036 (6.0% p.a.), while the Whittlesea LGA (containing Wollert) is forecast to grow from 231,800 to 265,970 between 2021 and 2026 (2.8% p.a.).

Recent planning approvals—including the Beveridge Northwest Precinct Structure Plan (**PSP**) and the Beveridge Interstate Freight Terminal (**BIFT**) Stage 1a Planning Scheme Amendment (**PSA**), both confirmed in August 2025—further reinforce the scale and timing of expected electricity demand increases resulting from this population growth.

The South Morang 66 kV sub-transmission loop, supplying more than 80,478 customers across the NGC, is already showing signs of constraint under this rapid growth. Supplied from the South Morang Terminal Station (**SMTS**), the loop comprises seven existing zone substations—Doreen (**DRN**), Kinglake (**KLK**), Kalkallo (**KLO**), Kilmore South (**KMS**), Murrindindi (**MDI**), Rubicon-A (**RUBA**), and Seymour (**SMR**). Two new zone substations—Beveridge (**BVE**) and Wollert (**WLT**)—are scheduled to be connected to this sub-transmission loop in 2027 and 2028, respectively. Their connection is expected to reduce system normal (**N**) loop capacity from 336 MVA to 267 MVA post-BVE and to 239 MVA post-WLT, due to changes in power flows expected on the loop.

Demand forecasts indicate that maximum demand will exceed the 267 MVA capacity by 2030 and the 239 MVA capacity by 2029 under 1-in-2-year probability of exceedance (**PoE50**) conditions. Recent heatwave events have shown that actual maximum demands at DRN, KLO and EPG are already tracking at 1-in-10-year (**PoE10**) levels. Under PoE10 conditions, thermal constraints are expected to escalate, with demand on the loop forecast to reach 238 MVA in 2027 and 277 MVA in 2028.

AusNet's planning assessments show that without intervention, there will be significant energy-at-risk and rising exposure to involuntary load shedding for customers supplied by the South Morang 66 kV sub-transmission loop. Approximately 12.05 MVA of additional capacity or demand reduction is needed by 2027-28, increasing to 93.44 MVA by 2031-32 to mitigate this risk. This demand could be met through network augmentation or non-network solutions such as demand management, embedded generation, or storage.

Recent summers however have highlighted the limitations of existing non-network measures within high-growth corridors. The prevailing demand response has proven inconsistent, diesel generation has been constrained by site availability and security issues, and back-feeding has created unacceptable feeder overload risks. These issues are compounded by rapid brownfield development in urban Epping and continued load growth across Beveridge, Wollert, Wallan, Wandong, Whittlesea, and surrounding communities.

The identified need for this RIT-D is to maintain supply reliability for our customers serviced by the South Morang 66 kV sub-transmission loop.

<sup>1</sup> [Victorian Planning Authority – The North Growth Corridor Plan](#), Victorian Planning Authority (VPA), 2012.

<sup>2</sup> [Victoria in Future](#), Victorian Department of Transport & Planning, 2023.

## Potential credible options

For this RIT-D, AusNet proposes to investigate and evaluate the following network options to address the identified need:

- Option 1: Reconductor SMTS-BVE line with 37/3.75 AAC conductor
- Option 2: Reconductor SMTS-BVE line with 19/4.75 AAC conductor
- Option 3: Reconductor both SMTS-BVE and BVE-KMS lines with 37/3.75 AAC conductor
- Option 4: Construct a new WLT-BVE-KMS Tee line with 37/3.75 AAC conductor
- Option 5: Combination of Option 1 & Option 4
- Option 6: Construct a 20 MW/100 MWh Battery Energy Storage System (**BESS**) at BVE

AusNet will also consider and evaluate any other alternative, non-network or stand-alone power system (**SAPS**) proposals that are submitted by interested parties during this RIT-D consultation, that can credibly address the identified need. This includes those that can either be combined with another solution to defer or reduce in scope credible network options being considered, and/or mitigate the rising exposure to involuntary load shedding in the lead up to implementing a network option.

## Submissions and next steps

The publication of this options screening report (**OSR**) marks the first step in the RIT-D consultation process, in line with clause 5.17 of the National Electricity Rules (**NER**)<sup>3</sup> version 244 published by the Australian Energy Market Commission (**AEMC**), and section 4.2 of the RIT-D Application Guidelines<sup>4</sup>, published by the Australian Energy Regulator (**AER**).

AusNet welcomes written submissions on the credible options presented in this OSR and invites proposals from proponents of potential non-network or SAPS options (stand-alone or in conjunction with a network solution) that meet the identified need. Any credible non-network or SAPS options will be assessed alongside the network options at the next stage of the RIT-D.

The consultation on this OSR is open for three months.

Submissions should be emailed to [ritdconsultations@ausnetservices.com.au](mailto:ritdconsultations@ausnetservices.com.au) on or before 10 July 2026.

Under the subject heading, please reference '**RIT-D OSR South Morang 66 kV Loop**'.

AusNet's preference is that these submissions would be published on its website and the Australian Energy Market Operator's (**AEMO**) website. If you do not wish to have your submission published, please clearly stipulate this at the time of lodging your submission.

Assessments of the options and responses to this OSR will be presented in the Draft Project Assessment Report (**DPAR**), which AusNet expects to publish by early August 2026.

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<sup>3</sup> [National Electricity Rules \(NER\)](#), Australian Energy Market Commission (AEMC), 2026.

<sup>4</sup> [Regulatory Investment Test for Distribution application guidelines](#), version 6, Australian Energy Regulator (AER), 2024.

## 2. Introduction

The regulatory investment test for distribution (**RIT-D**) is an economic cost-benefit assessment and consultation process designed to identify the credible option for an identified need on the electricity network, that maximises net economic benefits for stakeholders in the national electricity market (**NEM**) – the preferred option.

AusNet (the RIT-D proponent) has initiated this RIT-D to identify the preferred option to address the capacity limitations within the South Morang 66 kV sub-transmission loop.

The publication of this options screening report (**OSR**) marks the first step in the RIT-D consultation process, in line with clause 5.17 of the National Electricity Rules (**NER**)<sup>5</sup> version 244 published by the Australian Energy Market Commission (**AEMC**), and section 4.2 of the RIT-D Application Guidelines<sup>6</sup>, published by the Australian Energy Regulator (**AER**).

In accordance with those requirements, this document sets out:

- the identified need that AusNet is seeking to address, together with the assumptions used in identifying this need;
- a description of the potential credible network options that may address the identified need;
- the technical characteristics of each potential credible option;
- the estimated construction timetable and commissioning date;
- the total indicative capital and operating costs for each potential credible option and a high-level cost breakdown;
- the technical characteristics of the identified need that a non-network or stand-alone power system (**SAPS**) option would be required to provide; and
- information to assist non-network providers wishing to present alternative potential credible options including details of how to submit a proposal for consideration by the RIT-D proponent.

The appendix provides an overview of the RIT-D assessment and consultation process.

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<sup>5</sup> [National Electricity Rules \(NER\)](#), Australian Energy Market Commission (AEMC), 2026.

<sup>6</sup> [Regulatory Investment Test for Distribution application guidelines](#), version 6, Australian Energy Regulator (AER), 2024.

# 3. Background

This OSR relates to capacity limitations on the existing South Morang 66 kV sub-transmission loop, servicing the urban fringes of Melbourne’s northern suburbs. The loop originates from South Morang Terminal Station (**SMTS**) and comprises seven zone substations, including Doreen (**DRN**), Kinglake (**KLK**), Kalkallo (**KLO**), Kilmore South (**KMS**), Murrindindi (**MDI**), Rubicon-A (**RUBA**), and Seymour (**SMR**). Two new zone substations—Beveridge (**BVE**) and Wollert (**WLT**)—are planned to enter service in 2027 and 2028, respectively. The South Morang 66 kV loop is shown by Figure 1.

**Figure 1 - AusNet South Morang 66 kV loop**



The South Morang 66 kV sub-transmission loop supplies over 80,478 customers, including residential (60%), commercial (26%), industrial (9%), and agricultural (5%) customers. Rapid population and economic growth within Melbourne’s North Growth Corridor (**NGC**)<sup>7</sup>—notably Beveridge, Wollert, Wallan, parts of Wandong and Whittlesea, and urban Epping—has accelerated demand for network capacity, increasing the risk to supply reliability if not proactively addressed.

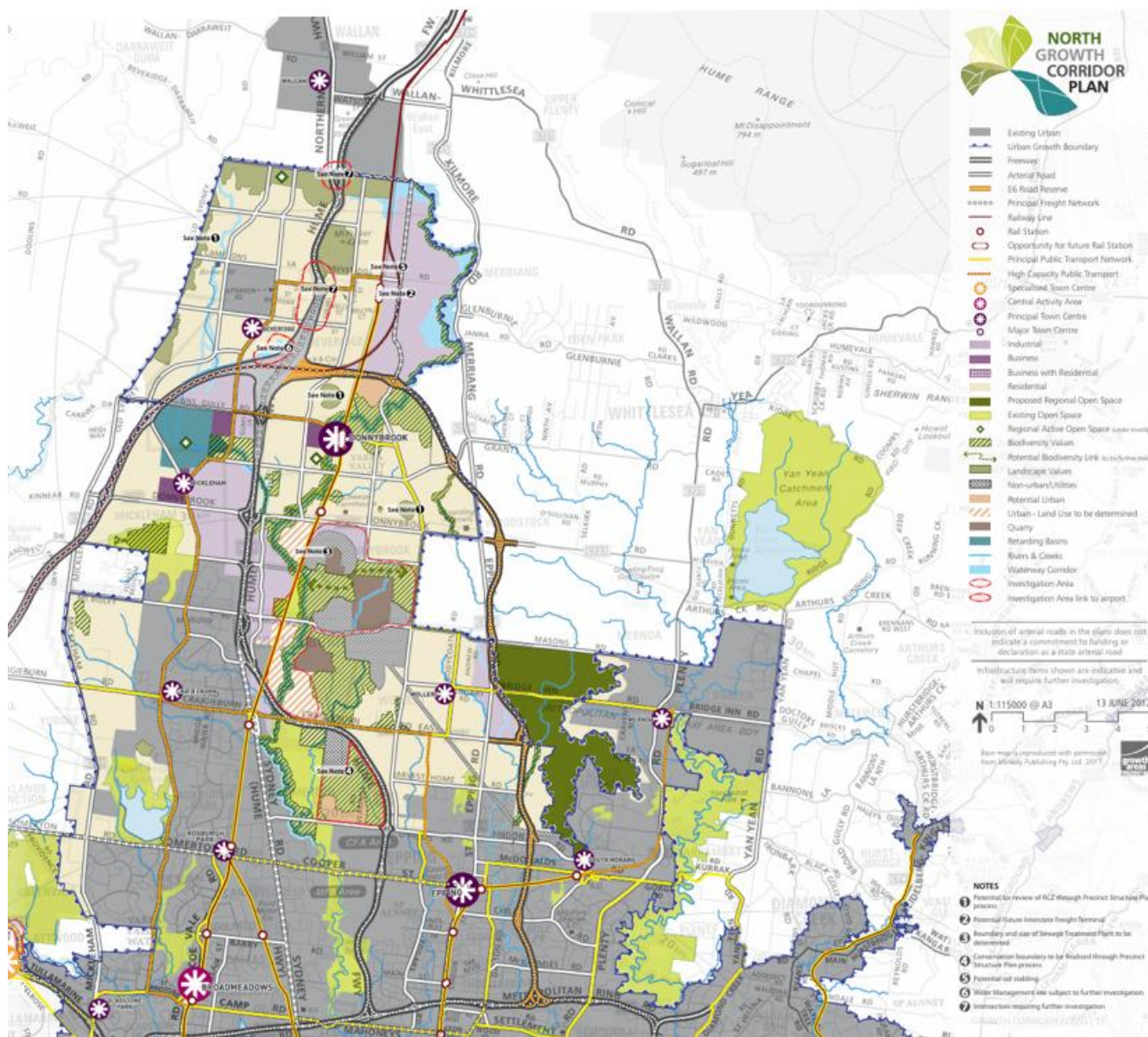
Beveridge and Wollert are experiencing the fastest population growth, with Beveridge increasing from 1,874 residents in 2016 to 4,642 in 2021 (≈20% annual growth) and Wollert growing from 9,060 to 24,407 over the same period (≈22% annual growth). Broader government forecasts reinforce this trajectory. Victoria’s Department of Transport and Planning (**VIF2023**)<sup>8</sup> projects the Mitchell local government area (**LGA**), containing Beveridge, to increase from 49,710 in 2021 to 119,830 in 2036 (6.0% p.a.), while the Whittlesea LGA (containing Wollert) is forecast to grow from 231,800 to 265,970 between 2021 and 2026 (2.8% p.a.).

<sup>7</sup> [Victorian Planning Authority – The North Growth Corridor Plan](#), Victorian Planning Authority (VPA), 2012.

<sup>8</sup> [Victoria in Future](#), Victorian Department of Transport & Planning, 2023.

Recent planning approvals—including the Beveridge Northwest Precinct Structure Plan (PSP) and the Beveridge Interstate Freight Terminal (BIFT) Stage 1a Planning Scheme Amendment (PSA), both confirmed in August 2025—further reinforce the scale and timing of expected electricity demand increases resulting from this population growth. The Victorian Planning Authority’s development plans for the area are illustrated in Figure 2.

**Figure 2 – North Growth Corridor Plan**



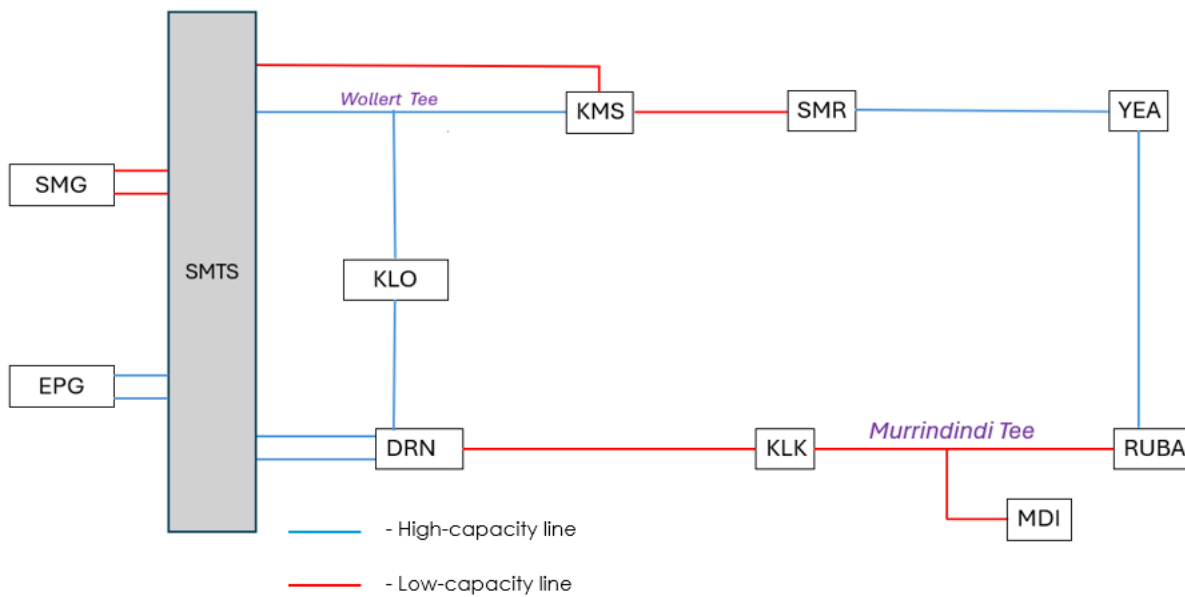
Source: Victorian Planning Authority

The existing network configuration is increasingly constrained. Demand growth, driven by residential expansions and commercial/industrial developments, is significant in Beveridge, Wollert, and Epping areas. To address capacity limitations, AusNet is already planning for two new zone substations, namely BVE and WLT, which are expected to be operational by 2027 and 2028, respectively.

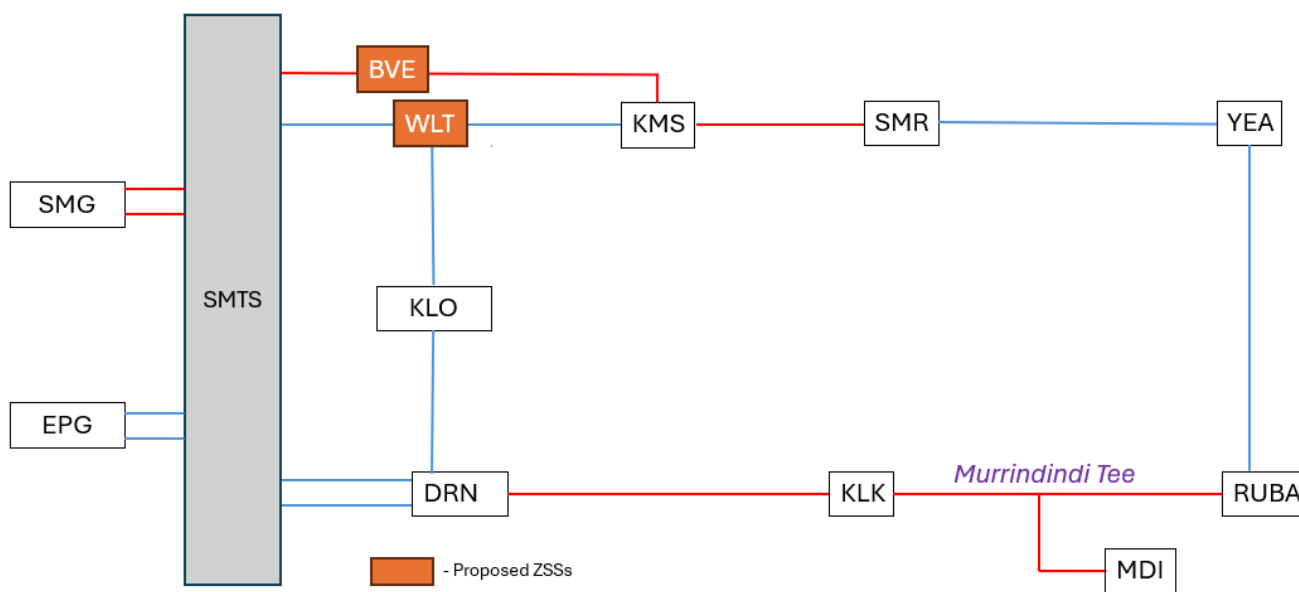
Their connection is expected to reduce system normal (N) loop capacity from 336 MVA to 267 MVA post-BVE and to 239 MVA post-WLT, due to changes in power flows expected on the loop. Demand forecasts indicate that maximum demand will exceed the 267 MVA capacity by 2030 and the 239 MVA capacity by 2029 under 1-in-2 year probability of exceedance (PoE50) conditions. Recent heatwave events have shown that actual maximum demands at DRN, KLO and Epping (EPG) are already tracking at 1-in-10 year (PoE10) levels. Under PoE10 conditions, thermal constraints are expected to escalate, with demand forecast to reach 238 MVA in 2027 and 277 MVA in 2028.

Figure 3 depicts the schematic single-line diagram of the existing South Morang 66 kV loop and indicates the high-capacity lines (these are represented by blue lines in the diagram) and low-capacity lines (denoted by red lines) on the South Morang 66 kV loop. The proposed 66 kV sub-transmission network arrangement with BVE and WLT connected is shown in Figure 4.

**Figure 3 – Location of high-capacity and low-capacity lines on the South Morang 66 kV network loop before BVE and WLT**



**Figure 4 – Location of high-capacity and low-capacity lines on the South Morang 66 kV network loop with BVE and WLT**



# 4. Identified need

## 4.1. Description

AusNet has identified in its 2025 Distribution Annual Planning Report (**DAPR**) covering the period 2026-2030, that BVE is planned to be connected via a cut-in to the adjacent 66 kV SMTS–KMS sub-transmission line (currently rated at 33.72 MVA), about 45 km from SMTS. Due to its limited capacity, the SMTS–BVE segment is expected to become overloaded once the new BVE load is added. This would result in rising exposure to involuntary load shedding and a significant reduction in network supply reliability, with the cost of expected unserved energy (**EUE**) being \$45.8 million in 2030-31. By 2031, following connection of both BVE and WLT<sup>9</sup>, the cumulative impact is \$81.1 million as shown in Table 1.

**Table 1 – Expected unserved energy (EUE) over the 15-year assessment period**

	2026-27	2027-28	2028-29	2029-30	2030-31	Total 2027-31	15-year assessment period cumulative total
Total EUE (MWh)	0.4	62.7	232.2	531.2	1072.1	1,898.6	184 GWh
Cost of EUE (\$M)	0.0	2.7	9.9	22.7	45.8	81.1	7,853.4

With the connection of BVE and WLT, the 66 kV loop capacity is expected to decrease as the values as depicted in the Table 2.

**Table 2 – Loop limits under system normal and single contingency scenarios**

Scenario	Do nothing		Post BVE in 2027		Post WLT in 2028		
	Summer Thermal Limit (MVA)	Winter Thermal Limit (MVA)	Summer Thermal Limit (MVA)	Winter Thermal Limit (MVA)	Summer Thermal Limit (MVA)	Winter Thermal Limit (MVA)	
<b>System Normal (N)</b>	336	377	268	343	239	305	
<b>Single Contingency (N-1)</b>	KMS-BVE	N/A	N/A	312	365	195	233
	DRN-KLO	274	270	249	289	225	263
	SMTS-BVE	N/A	N/A	276	320	195	237
	SMTS-DRN 1	235	254	237	257	232	295
	SMTS-DRN 2	235	254	237	257	232	295
	SMTS-KMS	305	335	N/A	N/A	N/A	N/A
	SMTS-WOL	N/A	N/A	N/A	N/A	167	214
	WLT-Tee	230	291	168	212	N/A	N/A
	KMS-WLT	N/A	N/A	N/A	N/A	160	199
	KLO- WLT	N/A	N/A	N/A	N/A	248	317

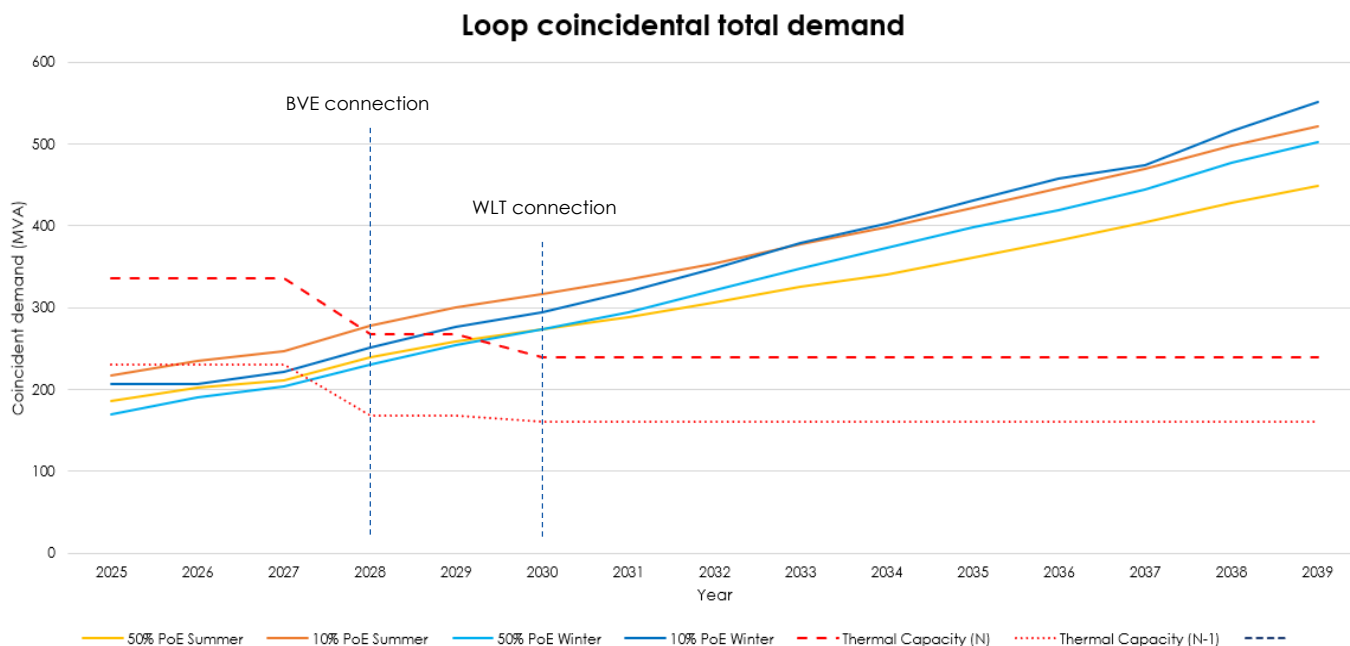
With the connection of BVE in 2027, the system normal planning limit of 336 MVA will drop to 268 MVA and then will further decrease to 239 MVA in 2028 with WLT in service.

Demand on the South Morang 66 kV loop shows a steady increase over the assessment period as presented in Figure 5. With the connection of BVE and WLT, it is expected to transfer existing loads from KLO, DRN and EPG, in addition to the prospective loads in the area.

<sup>9</sup> BVE and WLT zone substations are required at their proposed locations because they sit directly within the fastest-growing load centres of the NGC, where existing supply from KLO, DRN and EPG is already overloaded or forecast to exceed capacity. Their sites lie immediately adjacent to existing 66 kV sub-transmission corridors, enabling short, direct connections without the need for extensive new easements, long underground feeder routes or complex construction in constrained arterial road and freeway corridors. Connecting both substations to the SMTS–KMS/KLO sections of the South Morang 66 kV loop is the only technically and geographically feasible interface, as alternative higher-capacity corridors (e.g., SMTS–DRN or DRN–KLO) are too distant, lack easement availability, and would require prohibitively long, costly and high-risk line routes. Without the addition of BVE and WLT, the SMTS–KMS line would remain within its existing 33.7 MVA summer rating; however, the committed growth centred on these new substations drives load beyond its capability, creating the need for intervention to maintain reliability and comply with system-normal and single contingency limits. Economic modelling has found that these conditions result in a material expected cost to customers from energy not supplied and results in a material network reliability risk.

AusNet's probabilistic planning assessments show that without intervention, there will be significant energy-at-risk and rising exposure to involuntary load shedding. Approximately 12.05 MVA of additional capacity or demand reduction is needed by 2027-28, increasing to 93.44 MVA by 2031-32.

**Figure 5 – Total coincidental load forecast of the South Morang 66 kV loop**



Whilst the South Morang 66 kV loop has not yet experienced thermal capacity exceedance under system normal conditions, other capacity limitations within the downstream network have been mitigated using mobile generation to provide generation support under high load scenarios and planned maintenance. This has moderated demand levels on the loop.

To manage network demand through recent seasons, AusNet deployed targeted generation during summer 2024-25, including 3.95 MW at the Wallan Sewer Plant (YVW), multiple units at Freeway Enterprise totalling 2.6 MW, and additional capacity at Beveridge (0.9 MW) and Hidden Valley (2.2 MW). These deployments were not without challenges, particularly in finding suitable sites and managing the significant costs of security following repeated copper theft incidents last summer.

Despite these efforts, load shedding was still required to protect equipment from overload damage and maintain overall system integrity, highlighting the scale of the network capacity limitations we are experiencing in this area.

In summer 2025-26, a 12 MW generation site was established to support the network while some critical feeders were operated at emergency ratings for short durations to provide additional capacity.

While these measures have helped mitigate risks in the interim, challenges remain until a permanent solution is in place. This will become a growing issue over the assessment period, especially given the South Morang 66 kV loop is expected to exceed thermal capacity limits.

## 4.2. Thermal capacity limitations

Figure 5 forecasts that customers serviced from the South Morang 66 kV loop would be exposed to supply reliability risk under both system-normal and single contingency (N-1) conditions whenever demand exceeds the relevant thermal limits of the loop.

Exceeding these limits can drive 66 kV lines beyond their continuous ratings, and although conductor thermal inertia provides a short buffer, it significantly limits the time available for network controllers to reduce loading. If not addressed promptly, this can lead to permanent conductor damage and potentially trigger cascading network failures.

Out of the constrained line segments, SMTS-KMS is a critical sub-transmission line with a length of 60.8 km with limited capacity of 33.72 MVA summer cyclical rating. The composition of different conductor types along the line length is as depicted in the Figure 6.

**Figure 6 - Existing conductor composition of SMTS-KMS 66 kV line**

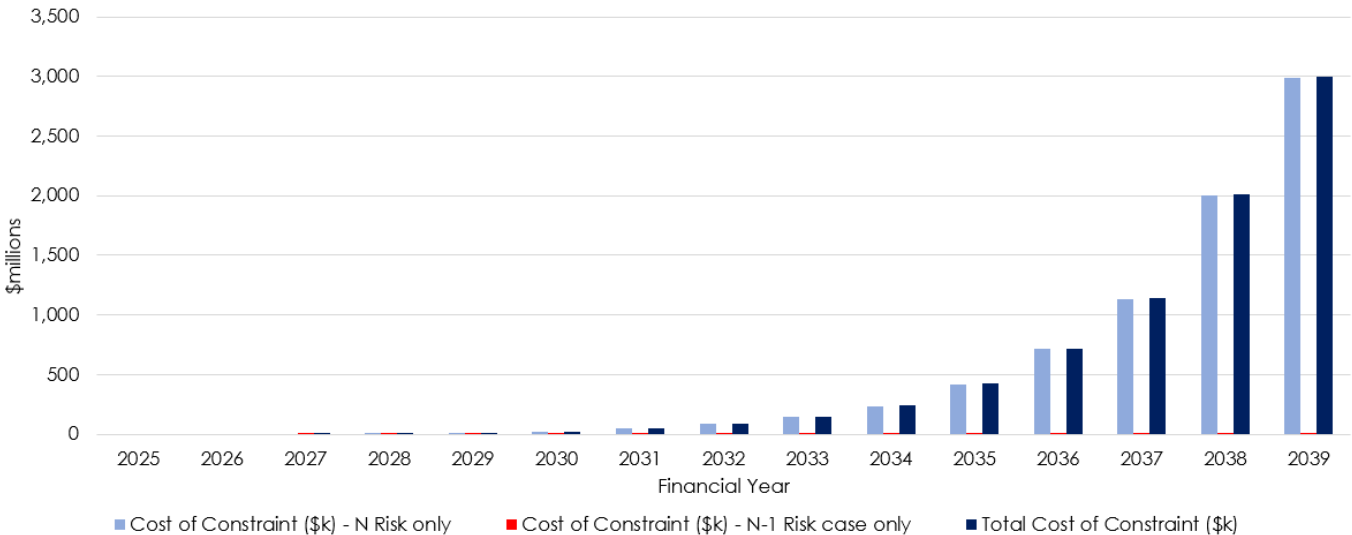
	SMTS				BVE Cut-in				KMS			
Conductor type	37/3.75_AAC	19/128_AAC	19/183_AAC	37/3.75_AAC	19/166_AAC	37/3.75_AAC	19/3.25_AAC	19/089_Cd Cu	37/3.75_AAC	6/186 7/062_ACSR/GZ	6/186 7/062_ACSR/GZ	19/4.75_AAC
Length (km)	7.67	0.11	2.48	5.35	2.11	3.76	0.54	4.35	0.15	18.44	14.69	1.21

Out of the full line length, only 17 km of the line is constructed using 37/3.75 AAC conductor and the rest of the conductor types are constraining the overall line capacity.

## 4.3. Risk assessment

A probabilistic planning approach has been used to assess energy at risk and the economic viability of mitigation. If unaddressed, summer contingency plans require immediate load shedding of up to 50% at four major zone substations under certain single contingency scenarios to prevent voltage collapse and thermal overload, resulting in unserved energy with an expected cumulative value of \$7.9 billion (undiscounted real 2025 dollars) over the 15-year assessment period. This cost, based on AER’s Value of Customer Reliability (VCR)<sup>10</sup>, reflects the economic impact on customers from supply interruptions. Analysis indicates energy at risk will increase exponentially over the 15-year assessment period. This is shown in Figure 7.

**Figure 7 - Cost of EUE on the South Morang 66 kV loop**



## 4.4. Summary of identified need

Our analysis of forecast demand, coupled with existing thermal and voltage limits on the South Morang 66 kV loop, indicate that mitigation actions are required to address the increasing risk to the provision of reliable services to our customers.

To avoid network augmentation, we require approximately 22 MVA of additional capacity to the existing line or load reduction/generation of approximately 20 MW through alternative non-network approaches such as demand management or network support agreements at strategic locations on the loop to maintain the reliable supply of electricity to customers served by the South Morang 66 kV network loop. The indicative values are based on the forecast for summer 2031-32.

AusNet is committed to ensuring reliable, affordable energy and supporting electrification. Addressing this identified capacity limitation will help to ensure that AusNet is able to meet forecast load growth prudently and efficiently in the region, address thermal loading issues, and raise the voltage collapse limit of the loop to deliver improved customer outcomes.

<sup>10</sup> [Values of Customer Reliability](#), Australian Energy Regulator (AER), December 2025.

Feedback from our customer engagement has underscored the importance of ensuring that we provide our customers with reliable electricity supply, with minimal unplanned disruptions. Customers have expressed concern regarding the impacts of poor reliability given customers' increasing reliance on electricity to meet a range of diverse needs such as transport, telecommunications, working from home, maintaining comfort during extreme weather conditions, and to meet health needs.

Consistent with that feedback, the identified need for this RIT-D is to maintain supply reliability for our customers serviced by the South Morang 66 kV sub-transmission loop.

## 4.5. Assumptions underpinning the identified need

Key factors underpinning the identified need include:

- Demand forecast –The demand forecast is based on AusNet's standard forecasting methodology and accounts for organic growth and block loads.
- New BVE and WLT zone substations are planned to be commissioned in 2027 and 2028, respectively.
- The probabilistic assessment of EUE is based on a weighted-demand methodology. Total EUE is calculated using a 30 % weighting of the EUE derived under PoE10 maximum demand conditions and a 70 % weighting of the EUE derived under PoE50 maximum demand conditions. This approach reflects both high-demand and central-demand conditions in the risk evaluation and ensures that the timing of required investment is informed by the full distribution of plausible demand outcomes rather than a single PoE forecast
- Sub-transmission line unavailability rates have been determined in accordance with AusNet's Distribution Network Planning Standards and Guidelines, applying a standard outage duration of 2 hours for rural line segments and 1 hour for urban line segments.
- In the case of a single contingency event on the loop, where the loading is above the limit for voltage collapse, all load on the loop is assumed to be interrupted for a duration of 1 hour.
- For the non-network BESS option, the BESS units are replaced at every 15-year period consistent with their expected asset life.

# 5. Potential credible options

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

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

The purpose of this RIT-D is to identify the credible option for addressing the identified need that maximises the net market benefit. AusNet proposes to investigate and evaluate the following network options:

- Option 1: Reconductor SMTS-BVE line with 37/3.75 AAC conductor
- Option 2: Reconductor SMTS-BVE line with 19/4.75 AAC conductor
- Option 3: Reconductor both SMTS-BVE and BVE-KMS lines with 37/3.75 AAC conductor
- Option 4: Construct a new WLT-BVE-KMS Tee line with 37/3.75 AAC conductor
- Option 5: Combination of Option 1 & Option 4
- Option 6: Construct a 20 MW/100 MWh Battery Energy Storage System (**BESS**) at BVE

AusNet will also consider and evaluate any other alternative, non-network or SAPS proposals that are submitted by interested parties during this RIT-D consultation, that can credibly address the identified need. This includes those that can either be combined with another solution to defer or reduce in scope credible network options being considered, and/or mitigate the rising exposure to involuntary load shedding in the lead up to implementing a network option.

## 5.1. Option 0: Do nothing

The do nothing (or business-as-usual) option assumes that AusNet would not undertake any investment, outside of normal operational and planning processes for managing peak demand and voltage limits. This option is the counterfactual to the other options considered and establishes the base level of risk (base case) and basis for comparing other credible options.

While this option does not entail any upfront capital costs, it exposes customers to the continuing risk of network outages as it does not address the identified need, which is the risk of unserved energy because of the capacity and voltage limits on the loop being exceeded. AusNet has quantified the expected cumulative value of unserved energy to be \$7.9 billion (undiscounted real 2025 dollars) over the 15-year evaluation period.

This option does not meet our customers' expectations of a reliable electricity supply, which requires investment to avoid unplanned network outages. Furthermore, this option does not align with AusNet's asset management objectives of being future ready and meeting customer needs by maintaining the long-term reliability of our distribution network.

## 5.2. Option 1: Reconductor SMTS-BVE line with 37/3.75 AAC conductor

This option involves reconductoring all undersized conductors (19/.128 AAC, 19/.183 AAC, 19/.166 AAC, 19/3.25 AAC, 19/.089 Cd Cu and 6/.186 7/.062 ACSR/GZ) along the full length of the SMTS-KMS 66 kV line up to BVE cut-in (approximately 28 km) with 37/3.75 AAC conductor and redesigning them to a maximum conductor temperature of 100 degrees Celsius to achieve a minimum summer cyclic rating of 117 MVA.

Undersized conductors on this network loop have been identified by AusNet that need to be replaced. In total, AusNet has identified 46 km of conductor that require replacement. Figure 8 below compares the current configuration of the SMTS-KMS line up to BVE cut-in before and after the line has been reconducted.

**Figure 8 - Comparison of South Morang 66 kV loop after reconductoring SMTS-BVE 66 kV line with 37/3.37 AAC conductor**

Before

	SMTS										BVE Cut-in		KMS
Conductor type	37/3.75_AAC	19/.128_AAC	19/.183_AAC	37/3.75_AAC	19/.166_AAC	37/3.75_AAC	19/3.25_AAC	19/.089_Cd Cu	37/3.75_AAC	6/.186 7/.062_ACSR/GZ	6/.186 7/.062_ACSR/GZ	19/4.75_AAC	
Length (km)	7.67	0.11	2.48	5.35	2.11	3.76	0.54	4.35	0.15	18.44	14.69	1.21	
After													
Conductor type	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	37/3.75_AAC	6/.186 7/.062_ACSR/GZ	19/4.75_AAC	

Reconductoring undersized conductors along the SMTS-KMS line up to BVE cut-in will increase the line rating from 295 A to 1025 A, while also significantly reducing the impedance of this line. Key benefits from this augmentation would include:

- Significantly increasing the system normal planning limit and thermal capacity of the South Morang 66 kV network, from 239 MVA to 371 MVA.
- Reducing network losses.

The construction would commence in December 2026, with project completion expected by December 2028. The estimated capital cost of this option is \$33.7 million. In relation to operations and maintenance (O&M) expenditure, AusNet does not expect this option to have a material impact on future O&M costs i.e., routine maintenance expenditure would be unchanged.

## 5.3. Option 2: Reconductor SMTS-BVE line with 19/4.75 AAC conductor

This option involves reconductoring all undersized conductors (19/.128 AAC, 19/.183 AAC, 19/.166 AAC, 19/3.25 AAC, 19/.089 Cd Cu and 6/.186 7/.062 ACSR/GZ) along the full length of the SMTS-KMS 66 kV line up to BVE cut-in (approximately 26 km) with 19/4.75 AAC conductor and redesigning them to a maximum conductor temperature of 100 degrees Celsius to achieve a minimum summer cyclic rating of 105 MVA.

Figure 9 below compares the current configuration of the SMTS-KMS line up to BVE cut-in before and after the line has been reconductored with 19/4.75 AAC conductor.

**Figure 9 - Comparison of South Morang 66 kV loop after reconductoring SMTS-BVE 66 kV line with 19/4.75 AAC conductor**

Before

	SMTS										BVE Cut-in		KMS
Conductor type	37/3.75_AAC	19/.128_AAC	19/.183_AAC	37/3.75_AAC	19/.166_AAC	37/3.75_AAC	19/3.25_AAC	19/.089_Cd Cu	37/3.75_AAC	6/.186 7/.062_ACSR/GZ	6/.186 7/.062_ACSR/GZ	19/4.75_AAC	
Length (km)	7.67	0.11	2.48	5.35	2.11	3.76	0.54	4.35	0.15	18.44	14.69	1.21	
After													
Conductor type	37/3.75_AAC	19/4.75_AAC	19/.183_AAC	37/3.75_AAC	19/4.75_AAC	37/3.75_AAC	19/4.75_AAC	19/4.75_AAC	37/3.75_AAC	19/4.75_AAC	6/.186 7/.062_ACSR/GZ	19/4.75_AAC	

Reconductoring undersized conductors along the SMTS-KMS line up to BVE cut-in will increase the line rating from 295 A to 915 A, while also significantly reducing the impedance of this line. Key benefits from this augmentation would include:

- Significantly increasing the system normal planning limit and thermal capacity of the South Morang 66 kV network, from 239 MVA to 363 MVA.
- Reducing network losses.

The construction would commence in December 2026, with project completion expected by December 2028. The estimated capital cost of this option is \$16.5 million. In relation to O&M expenditure, AusNet does not expect this option to have a material impact on future O&M costs i.e., routine maintenance expenditure would be unchanged.

# 5.4. Option 3: Reconductor both SMTS–BVE and BVE–KMS lines with 37/3.75 AAC conductor

This option involves reconductoring all undersized conductors (19/.128 AAC, 19/.183 AAC, 19/.166 AAC, 19/3.25 AAC, 19/.089 Cd Cu and 6/.186 7/.062 ACSR/GZ) along the full length of the SMTS-KMS 66 kV line (approximately 42 km) with 37/3.75 AAC conductor and redesigning them to a maximum conductor temperature of 100 degrees Celsius to achieve a minimum summer cyclic rating of 117 MVA.

Figure 10 below compares the current configuration of the SMTS-KMS line up to BVE cut-in before and after the line has been reconducted with 19/4.75 AAC conductor.

**Figure 10 - Comparison of South Morang 66 kV loop after reconductoring full length of SMTS-KMS 66 kV line with 37/3.75 AAC conductor**

Before

	SMTS					BVE Cut-in					KMS	
Conductor type	37/3.75 AAC	19/.128 AAC	19/.183 AAC	37/3.75 AAC	19/.166 AAC	37/3.75 AAC	19/3.25 AAC	19/.089 Cd Cu	37/3.75 AAC	6/.186 7/.062 ACSR/GZ	6/.186 7/.062 ACSR/GZ	19/4.75 AAC
Length (km)	7.67	0.11	2.48	5.35	2.11	3.76	0.54	4.35	0.15	18.44	14.69	1.21
After												
Conductor type	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	37/3.75 AAC	19/4.75 AAC

Reconductoring undersized conductors along the SMTS-KMS line up to BVE cut-in will increase the line rating from 295 A to 1025 A, while also significantly reducing the impedance of this line. Key benefits from this augmentation would include:

- Significantly increasing the system normal planning limit and thermal capacity of the South Morang 66 kV network, from 239 MVA to 371 MVA.
- Reducing network losses.

The construction would commence in December 2026, with project completion expected by December 2028. The estimated capital cost of this option is \$45.6 million. In relation to O&M expenditure, AusNet does not expect this option to have a material impact on future O&M costs i.e., routine maintenance expenditure would be unchanged.

# 5.5. Option 4: Construct a new WLT-BVE-KMS Tee line with 37/3.75 AAC conductor

This option involves constructing a new 66 kV line of approximately 13 km, starting as a cut-in from the existing WLT Tee-KMS line up to BVE cut-in point with 37/3.75 AAC conductor, as presented in Figure 11.

Figure 11 – Proposed new BVE Tee – BVE 66 kV line route



The construction would commence in December 2026, with project completion expected by December 2027. The estimated capital cost of this option is \$9.8 million. In relation to O&M expenditure, annual routine maintenance expenditure would be \$0.1 million.

## 5.6. Option 5: Combination of Option 1 & Option 4

This option involves reconductoring all undersized conductors (19/.128 AAC, 19/.183 AAC, 19/.166 AAC, 19/3.25 AAC, 19/.089 Cd Cu and 6/.186 7/.062 ACSR/GZ) along the full length of the SMTS-KMS 66 kV line up to BVE cut-in (approximately 28 km) with 37/3.75 AAC conductor and constructing a new 66 kV line of approximately 13 km, starting as a cut-in from the existing WLT Tee-KMS line up to BVE cut-in point with 37/3.75 AAC conductor.

The construction would commence in December 2026, with project completion expected by December 2028. The estimated capital cost of this option is \$43.9 million. In relation to O&M expenditure, annual routine maintenance expenditure would be \$0.4 million.

## 5.7. Option 6: Construct a 20 MW/100 MWh BESS at BVE

This option involves construction of a BESS of 20 MW / 100 MWh at the proposed zone substation located at Beveridge to provide support at a major load centre on the loop. This analysis assumes a BESS life of 15-years. At BESS end of life or loading increase beyond the 15-year forecasting period, it is expected the entire existing SMTS-KMS 66 kV line will need to be reconducted (approximately 43 km, as per Option 3).

The BESS will reduce the loading requirement on the loop by providing a temporary source close to the major load centre of Beveridge and Wollert areas, reducing the current through major legs SMTS-BVE-KMS and DRN-KLK. Support provided by the BESS will defer the requirement to reductor SMTS-KMS line to beyond the next regulatory period, however, this will still be required at either BESS end of life or should load increase beyond the forecasting period. The BESS has been sized to support the loop for 5 hours – based on historic peak load duration. The proposed BESS and associated works would:

- Significantly increase the system normal planning limit and thermal capacity of the South Morang 66 kV network.
- Significantly increase the single contingency voltage collapse limits for outage of either the SMTS-BVE and DRN-KLK lines.
- Reduce network losses.

The construction would commence in December 2026, with project completion expected by December 2027. The estimated capital cost of this option is \$63.3 million. In relation to O&M expenditure, annual routine maintenance expenditure would be \$0.61 million.

## 5.8. Option 7: Non-network or SAPS solutions

The NER require DNSPs to investigate non-network and SAPS options as part of the RIT-D process.

For this option, AusNet will consider and evaluate any alternative, non-network or SAPS proposals that are submitted by interested parties during this RIT-D consultation, that can credibly address the identified need.

AusNet will also identify whether a non-network solution can be combined with another solution to defer, reduce in scope, or address the rising exposure to involuntary load shedding in the lead up to implementation of the credible network options being considered.

The following non-network solutions located at strategic locations within the Beveridge area are likely to be potentially feasible options to address the identified need (at least in part):

- New dispatchable generation;
- New renewable generation firmed up by energy storage systems;
- Demand management using customer standby generation and/or controllable load.

Without limiting the potential for non-network solutions, the following types of non-network options are unlikely to be feasible:

- Renewable generation not coupled with dispatchable generation, storage or controllable load;
- Behavioural demand response not coupled with dispatchable generation, storage, or controllable load; and
- Unproven, experimental, or undemonstrated technologies.

Details of the characteristics and requirements needed for a non-network or SAPS solution to address the identified need are described in Section 6 of this OSR.

## 5.9. Options considered but not progressed

### 5.9.1. Demand management

There is limited ability for demand reductions to reduce peak demand on the South Morang 66 kV network loop of the magnitude required to defer the need for augmentation. There are no customers directly connected to the 66 kV loop. Moreover, while there is the potential for 415 kW of demand reduction on the 22 kV networks this does not deliver the necessary load reduction required to address the identified need. This would total 0.2% of the expected coincident demand in 2027 under 50PoE conditions which is insufficient to defer augmentation under AusNet's 50PoE summer forecasts.

### 5.9.2. Temporary generation

To maintain system resilience over recent summers, AusNet deployed targeted temporary generation, but with demand expected to increase further, these measures underscore the need for permanent solutions. During summer 2024-25, deployments included 3.95 MW at Wallan Sewer Plant (YVW), 2.6 MW at Freeway Enterprise, 0.9 MW at Beveridge and 2.2 MW at Hidden Valley. These sites were challenging to establish and incurred significant security costs due to repeated copper theft. Despite these efforts, load shedding was still required to protect equipment. In summer 2025-26, a 12 MW generation site was commissioned, and several critical feeders were briefly run at emergency ratings to support reliability. While these interventions provided short-term relief, the increasing magnitude and complexity of demand growth make clear that a coordinated, long-term program of network investment is essential to meet reliability obligations and enable continued customer connections within the NGC.

## 6. Non-network or SAPS options

This section provides information regarding the non-network or SAPS services that would be required to address the identified need, including:

- The technical characteristics that a non-network or SAPS option would be required to deliver;
- The estimated maximum deferred augmentation charge that would be available to pay for the network support services provided by the non-network or SAPS solution; and
- The information that a non-network or SAPS proponent should provide to AusNet to explore the potential provision of a non-network or SAPS service.

### 6.1. Required technical characteristics of a non-network option

Table 3 below sets out the dispatchable load that a non-network or SAPS option, preferably at BVE would be required to deliver. The objective would be to mitigate the risks associated with the unserved load in the South Morang loop. The information presented provides an indication of the required operating profile, noting that prospective non-network service providers may not be able to exactly (or fully) match these requirements to be considered a credible solution.

**Table 3 Load and respective duration to be catered by the non-network solution**

SUMMER YEAR	MAXIMUM TOTAL LOOP LOAD AT RISK (MVA)	HOURS AT RISK (H)	EUE (MWH)
2027-28	12.05	12.64	62.7
2028-29	25.09	20.15	232.2
2029-30	40.54	23.12	531.2
2030-31	65.35	26.10	1072.1
2031-32	93.44	31.11	2009.7
2032-33	128.05	37.66	3481.3
2033-34	160.21	43.88	5573.5
2034-35	205.11	48.75	9875.2

### 6.2. Power system security, reliability, and fault levels

A non-network option must be capable of reliably curtailing load under a range of conditions and scenarios. The non-network solution will contribute to system security and reliability to the extent that it addresses the risks arising

from the identified need. The non-network option is not required to address any existing issues in relation to fault levels.

If the non-network option is an inverter-based generator operating in parallel with AusNet's network, the generator must comply with the requirements set out in document SOP 33-05 and other connection requirements which are set out in AusNet Services' [embedded generator connections page](#).

## 6.3. Guidance on potentially feasible options

The following non-network solutions are likely to be potentially feasible options to address the identified need:

- New embedded energy storage systems or load connections;
- Modifications to existing customer generation to include embedded energy storage systems; and
- Modifications to existing load connections to reduce load capacity.

Without limiting the potential for non-network solutions, the following types of non-network options are unlikely to be feasible:

- Renewable generation not coupled with storage or dispatchable generation; and
- Unproven, experimental, or undemonstrated technologies.

## 6.4. Information to be included in non-network solution proposals

Non-network or SAPS service providers interested in alleviating the network limitations described and quantified in this OSR are advised to begin engagement with AusNet as soon as possible. A detailed proposal including the information listed below should be prepared and submitted by the requested date, during the RIT-D OSR consultation period.

Details required include:

- Name, address and contact details of the person making the submission.
- Name, address and contact details of the person responsible for non-network support (if different to above).
- Evidence and history proving capability and previous experience in implementing and completing projects of the same type as the proposal.
- Letters of support from partner organisations.
- A detailed description of the services to be provided, including:
  - Size and capacity (MW/MVA/MWh).
  - Location(s) and whether proposed or confirmed.
  - Type of technologies (or actions) proposed for the solution.
  - Proposed dispatching arrangement (e.g. telephone, web-based trigger, automated means etc).
  - Period of notice required to enable dispatch of non-network support (e.g. to allow time for charging of energy storage solutions or market-based limitations).
  - Operating times, frequency, duration, response time, ramp rate, firmness details as applicable.
  - Availability and reliability performance details.
  - Proposed contract period and staging (if applicable).
  - Proposed timing for delivery (including timeline to plan and implement the proposal).
- High-level electrical layout of the proposed site (if applicable).
- Preliminary assessment of the proposal's impact on the network.

- Breakdown and timing of the lifecycle cost components for providing the service, including:
  - Capital costs (if applicable).
  - Annual operating (i.e. set up and dispatch fees) and maintenance costs.
  - Other costs (e.g. availability, project establishment, etc.).
  - Tariff assumptions.
  - Expected annual payment for providing the solution.
- A method outlining measurement and quantification of the agreed service, including integration of the proposed solution with the network.
- A statement outlining that the non-network service provider is prepared to enter into a Network Support Agreement (**NSA**) (subject to agreeing terms and conditions).
- Any special conditions to be included in an NSA.

All proposals must satisfy the requirements of any applicable laws, rules, and the requirements of any relevant regulatory authority, including following the normal network connection processes where applicable. Any network reinforcement costs required to accommodate the non-network solution will typically be borne by the proponent of the non-network or SAPS solution.

For further details on AusNet's process for engaging and consulting with non-network service providers, and for investigating, developing, assessing and reporting on non-network and SAPS options as alternatives to network augmentation, please refer to the Non-Network Solutions and Demand Management webpages, which contain the Industry Engagement Strategy and other relevant demand management documentation:

<https://www.ausnetservices.com.au/Electricity>

## 6.5. Potential payments to non-network proponents

At this stage, the preferred network option has not yet been determined. However, an assessment in evaluating the annualised cost and optimal timing was performed. The resultant total annualised cost that could be deferred by engaging a non-network solution is \$2.9 million and is based on Option 3 proceeding. Thus, the potential annual payment to non-network proponents would be \$2.9 million. However, the payment for a non-network solution may vary according to availability, capacity, dispatch duration and firmness of the non-network service, and the responses received from other non-network proponents. The actual payment to a non-network proponent will also be subject to negotiation.

AusNet welcomes the submission of non-network option proposals for review of the potential payment amount on a case-by-case basis. For more information or enquiries regarding non-network solutions to address the identified need, please email [rtdconsultations@ausnetservices.com.au](mailto:rtdconsultations@ausnetservices.com.au). Under the subject heading, please reference '**RIT-D OSR South Morang 66 kV Loop**'.

# 7. Compliance with NER

In accordance with clause 5.17.4 of the NER, we certify that the screening for non-network and SAPS options satisfy the first stage of the RIT-D. Table 4 shows how each of these requirements have been met by the relevant section of this OSR.

**Table 4: Compliance with regulatory requirements**

REQUIREMENT	SECTION
Clause 5.17.4 of the NER, Non-network options report must include the following:	Noted. See details below.
(1) a description of the identified need;	Section 4.
(2) the assumptions used in identifying the identified need (including, in the case of proposed reliability corrective action, why the RIT-D proponent considers reliability corrective action is necessary);	Section 4.5.
(3) if available, the relevant annual deferred augmentation charge associated with the identified need;	Section 6.5.
(4) the technical characteristics of the identified need that a non-network option or (in relation to a SAPS enabled network) a SAPS option would be required to deliver, such as:	Section 6.
(i) the size of load reduction or additional supply;	Section 6.1.
(ii) location;	Section 6.1.
(iii) contribution to power system security or reliability;	Section 6.2.
(iv) contribution to power system fault levels as determined under clause 4.6.1; and	Section 6.2.
(v) the operating profile;	Section 6.1.
(5) a summary of potential credible options to address the identified need, as identified by the RIT-D proponent, including network options, non-network options and (in relation to a SAPS enabled network) SAPS options.	Section 5.
(6) for each potential credible option, the RIT-D proponent must provide information, to the extent practicable, on:	Section 5.
(i) a technical definition or characteristics of the option;	Section 5.
(ii) the estimated construction timetable and commissioning date (where relevant); and	Section 5.
(iii) the total indicative cost (including capital and operating costs); and	Section 5.
(7) information to assist non-network providers wishing to present alternative potential credible options including details of how to submit a non-network proposal for consideration by the RIT-D proponent.	Section <b>Error! Reference source not found.</b>

# 8. Submissions and next steps

## 8.1. Request for submissions

AusNet invites written submissions and any queries, on the matters set out in this OSR, from Registered Participants, AEMO, interested parties, non-network providers and persons registered on our industry engagement register. As explained in section 6.4, prospective non-network and SAPS service providers interested in alleviating the network limitations outlined in this OSR are advised to begin engagement with AusNet as soon as possible.

The consultation on this OSR is open for three months.

All submissions and enquiries should be emailed to [ritdconsultations@ausnetservices.com.au](mailto:ritdconsultations@ausnetservices.com.au) on or before 10 July 2026

Under the subject heading, please reference 'RIT-D OSR South Morang 66 kV Loop'.

AusNet's preference is that these submissions would be published on its website and the Australian Energy Market Operator's (AEMO) website. If you do not wish to have your submission published, please clearly stipulate this at the time of lodging your submission.

## 8.2. Next stage of RIT-D process

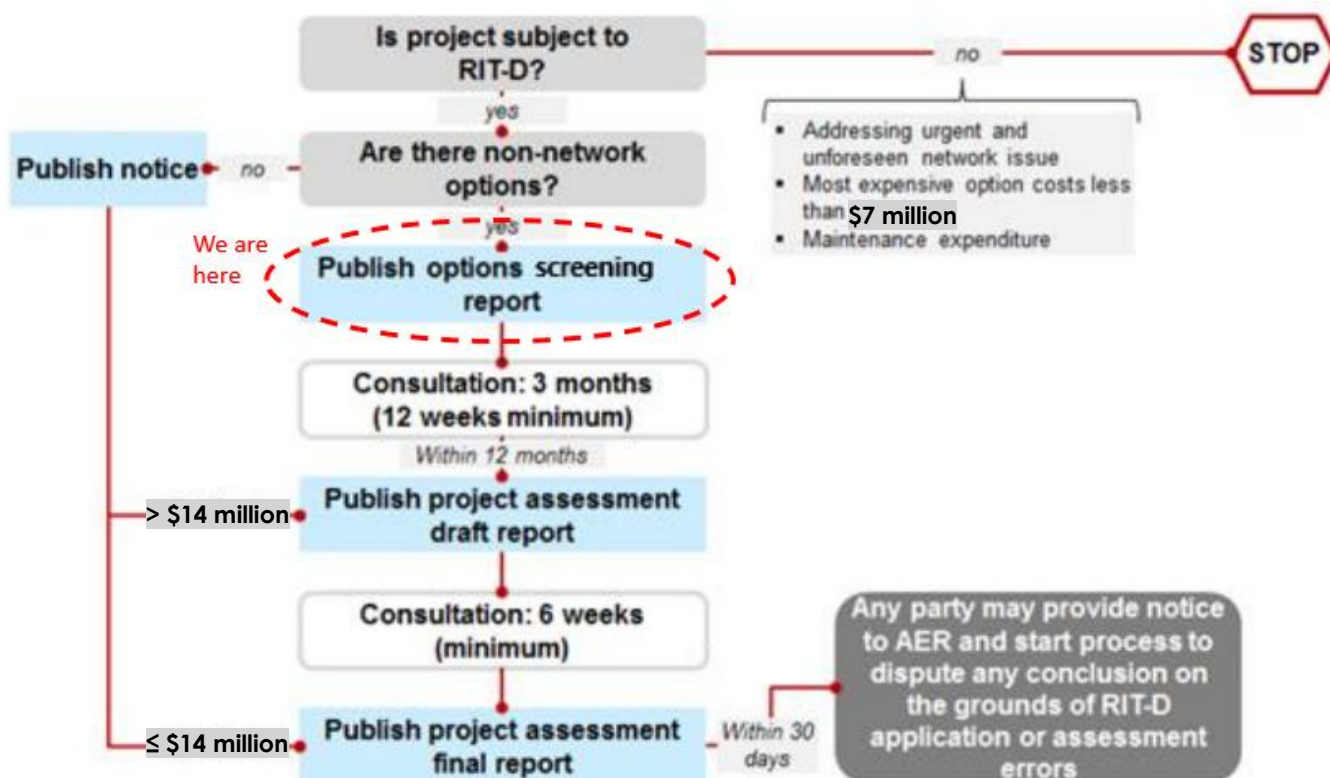
Following the conclusion of the consultation period for this OSR, AusNet will, having regard to any submissions received, prepare and publish the draft project assessment report (DPAR) which will include:

- A summary of, and commentary on, any submissions on this OSR.
- A detailed market benefit assessment of the proposed credible options to address the identified need.
- Identification of the proposed preferred option to meet the identified need.

AusNet expects to publish the DPAR by mid-August 2026.

The publication of the DPAR will initiate the second consultation step in the RIT-D process.

# Appendix – RIT-D assessment and consultation process<sup>11</sup>






<sup>11</sup> Australian Energy Regulator, "Regulatory investment test for distribution, Application guidelines", Section 4, November 2024 (updated).

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