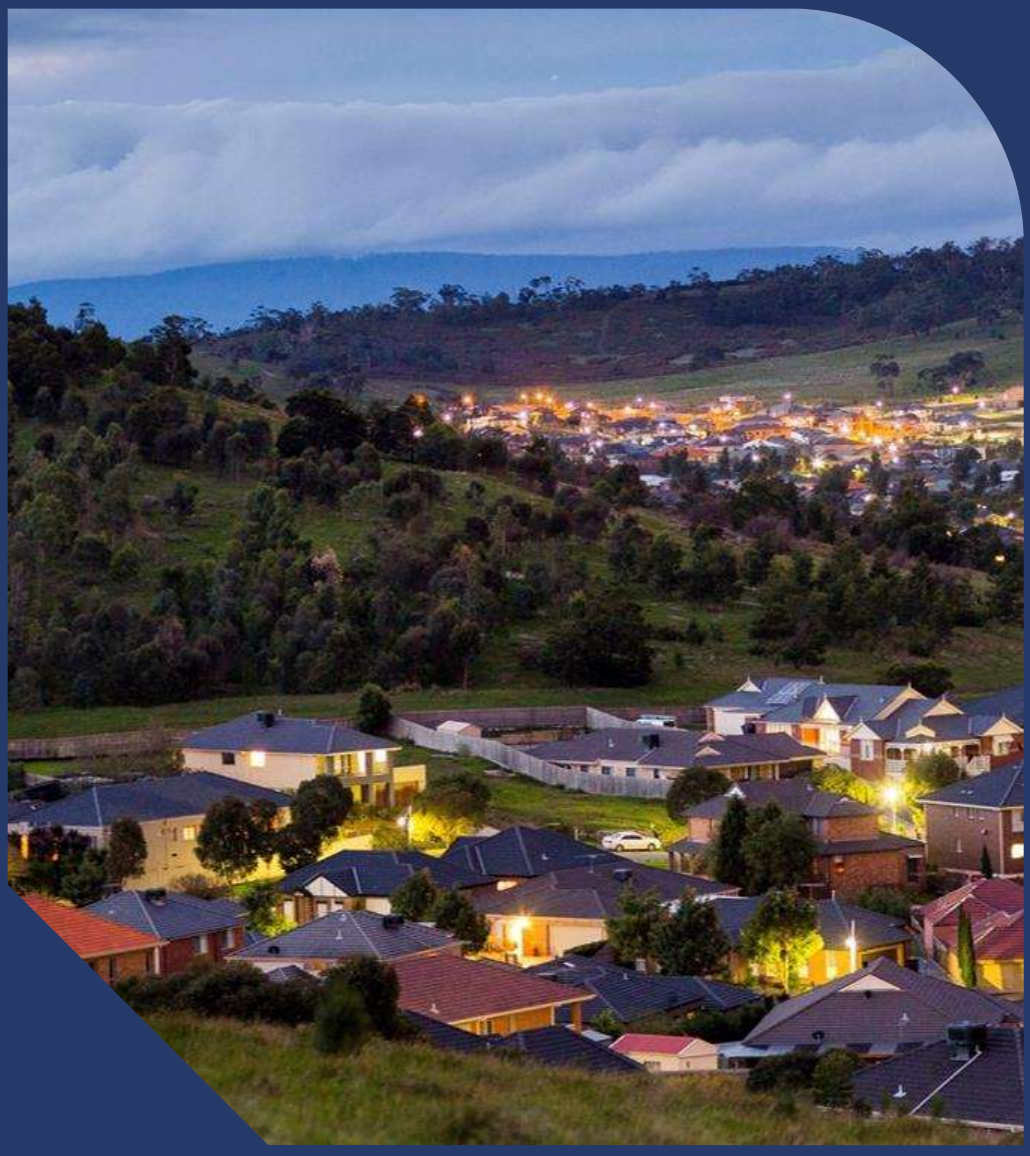
AusNet

Secure supply and enable connections: Beveridge

Regulatory Investment Test for Distribution (RIT-D)

Options Screening Report

Friday, 24 October 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.

As expected by our customers and required by the various regulatory instruments under which we operate, AusNet aims to maintain service levels at the lowest possible cost to our customers. To achieve this, we develop plans that aim to maximise the present value of economic benefit to all those who produce, consume and transport electricity in the National Electricity Market (NEM).

The Northern Growth Corridor[1] on the urban fringes of Melbourne's northern suburbs is a vast greenfield development area accommodating much of Melbourne's population and economic growth. There has been a significant increase in population in the Beveridge area. According to the 2016 census[2], there were 1,874 people living in Beveridge and by 2021[3], the corresponding figure was 4,642. This represents an average annual growth rate of approximately 30%.

It is expected that growth is likely to continue with the most recent forecast produced by Victoria's Department of Transport and Planning (VIF2023)[4] forecasting the population of the Mitchell local government area (LGA), which contains Beveridge, to grow from 49,460 to 69,600 from 2021 to 2026. This represents an overall annual growth rate for the whole LGA of 8.1% per annum.

The Beveridge area is currently supplied in part by AusNet's existing Kalkallo zone substation (KLO) through a rural network of 22 kV distribution feeders. Kalkallo zone substation (KLO) supplies over 17,439 AusNet customers (via five 22 kV distribution feeders), and over 13,448 Jemena Electricity Network (JEN) customers (via four 22 kV distribution feeders). AusNet has identified increasing energy at risk in parts of this network, including the Kalkallo zone substation, due to rapid demand growth in the Northern Growth Corridor. Of particular concern is the forecast growth on the two AusNet 22 kV distribution feeders - KLO14 and KLO24 - supplying the satellite suburbs of Beveridge, Wallan, parts of Wandong and Whittlesea, and their surrounds. Bushfire mitigation technology, specifically Remote REFCLs, has been deployed on both feeders.

The identified need is to efficiently maintain a reliable supply of power to the customers in the Beveridge area as the forecast demand exceeds the capacity of KLO14 and KLO24, that currently supply the load to the Beveridge area. The actual maximum demand on KLO14 and KLO24 has already exceeded their asset ratings of 14.5 MVA each and is expected to exceed the zone substation rating of 97.5 MVA in FY2029. Table 1 shows the levels of overload, after load transfers, for both the distribution feeders and the zone substation, under system normal conditions that exceed their asset ratings from FY2026.

Table 1Do Nothing Base Case Forecast 10PoE Overload (MVA)

OVERLOAD	FY26	FY27	FY28	FY29	FY30	FY31	FY32
KLO14	3.0	9.3	13.5	25.3	29.6	35.4	42.7
KLO24	2.7	4.9	6.6	8.4	10.2	12.1	14.8
TOTAL (Feeder)	5.7	14.2	20.1	33.7	39.8	47.5	57.5
KLO (N)	0.0	0.0	0.0	8.4	16.4	25.7	38.7
KLO (N-1)	14.7	32.7	40.9	56.8	64.8	74.1	87
TOTAL (ZSS) (N)	**0.0**	**0.0**	**0.0**	**8.4**	**16.4**	**25.7**	**38.7**
TOTAL (ZSS) (N-1)	**14.7**	**32.7**	**40.9**	**56.8**	**64.8**	**74.1**	**87**

AusNet is currently managing this overload with temporary diesel generators. **During the 2024–25 summer period, approximately 11.4 MWh of load was shed across KLO14 and KLO24 to prevent thermal overload.** This was supplemented by the deployment of mobile generators, providing 4.9 MW at KLO14 and 3 MW at KLO24. In preparation for the 2025–26 summer, works are underway to establish a 12 MW temporary generation site at Wallan. This site will support both KLO14 and KLO24 feeders with 6 MW allocated to each feeder. Identifying and securing lease for a suitable site was challenging due to limited availability of appropriately land. The location needed to be

[1] Victorian Planning Authority – The North Growth Corridor Plan, Victorian Planning Authority (VPA).
[2] 2016 Beveridge, Census, Australian Bureau of Statistics (ABS), 2016
[3] 2021 Beveridge, Census, Australian Bureau of Statistics (ABS), 2021.
[4] Victoria in Future, Victorian Department of Transport & Planning, 2023

sufficiently distanced from residential areas to mitigate noise impacts from temporary diesel generators. Additionally, the constrained land size restricts any future expansion or installation of additional generation units.

A material level of expected unserved energy (EUE) is calculated for distribution feeders KLO14 and KLO24 from FY26 and KLO zone substation from FY26 as shown in Table 2. The calculated unserved energy is based on demand exceeding capacity with all assets in service and considers available load transfers. The EUE has been weighted using the industry practice of 30% of 10PoE and 70% of 50PoE maximum demand forecasts and monetised using a locational Value of Customer Reliability (VCR).

Table 2 Do Nothing Base Case Forecast Expected Unserved Energy (EUE)

EUE	FY26	FY27	FY28	FY29	FY30	FY31	FY32
KLO14 (MWh pa)	10.3	280.7	3,092.8	24,246.1	42,693.1	69,353.1	102,520.6
KLO24 (MWh pa)	4.9	52.9	380.6	1,045.3	2,222.7	3,924.6	6,926.9
TOTAL (Feeder) (MWh pa)	**15.2**	**333.6**	**3,473.4**	**25,291.4**	**44,915.8**	**73,277.7**	**109,447.5**
TOTAL (Feeder) ($m, 2024 pa)	**0.7**	**15.2**	**158.3**	**1,153.1**	**2,047.7**	**3,340.5**	**4,989**
KLO (MWh pa)	0.7	13.8	32.3	133.2	470.5	2,101.1	7,327.4
TOTAL (ZSS) (MWh pa)	**0.7**	**13.8**	**32.3**	**133.2**	**470.5**	**2,101.1**	**7,327.4**
TOTAL (ZSS) ($m, 2024 pa)	**0**	**0.6**	**1.4**	**5.9**	**20.8**	**92.7**	**323.2**

AusNet is committed to supporting the achievement of Victoria Planning Authority's[5] economic growth plans for the Northern Growth Corridor by planning the AusNet network to accommodate the growing needs of customers, communities, industry, and businesses. By FY32, the distribution feeders total expected unserved energy and its monetised supply risk on customers are forecast to be 109,447 MWh pa and $4,989 million (real $2024) respectively. Similarly, by FY32, the zone substation expected unserved energy and its monetised supply risk on customers are forecast to be 7,327 MWh pa and $323 million (real $2024) respectively.

AusNet has undertaken a probabilistic planning approach to assess the energy at risk (load not being supplied) if no mitigation action is undertaken and whether it is economic to invest in risk mitigation action to reduce the forecast service level risk. With respect to distribution feeders, AusNet has identified that approximately 57.5 MVA of additional capacity or demand reduction is required by FY32 rising from a present need of 5.7 MVA[6], through network augmentation or alternative non-network approaches such as demand management, embedded generation and/or storage to enable the ongoing reliable supply of electricity to the Beveridge area. With respect to the KLO zone substation, approximate additional capacity or demand reduction requirements are also provided in the above table.

AusNet proposes to investigate and evaluate the following network options to address the identified need on the distribution feeders KLO14 and KLO24 and the zone substation KLO:

1. Build a new two-transformer zone substation at Beveridge with two new feeders
2. Install a third transformer and bus at the existing Kalkallo zone substation with two new feeders going North towards Beveridge.

AusNet has evaluated the feasibility of feeder transfers and concluded that this option is not viable. At peak demand, the transfer capacity between feeders KLO14 and KLO24 is effectively zero, with both feeders operating in an overloaded state throughout the assessment period. As a result, they cannot provide mutual backup.

The remaining adjacent tie options for KLO14 are DRN22 and KMS12. DRN22 is a non-REFCL feeder, rendering it unsuitable for transfer, particularly on Total Fire Ban (TFB) days when REFCL compliance is critical. KMS12, while technically available, is a constrained feeder. Forecasts indicate that its POE10 demand threshold will be exceeded by 2027.

In summary, all adjacent rural feeders present limitations—either due to REFCL-related restrictions or insufficient spare capacity, making feeder transfer an impractical solution. As a result, both feeders were subjected to load shedding during the 2024-25 summer period.

[5] Victorian Planning Authority - VPA.
[6] Total overloads in Table 1.

The Northern Growth Corridor comprises two distinct geographic areas, each subject to separate planning considerations.

- **Area One – Beveridge**: This is addressed in the current Options Screening Report. The proposed Beveridge zone substation is intended to mitigate supply risks on the northern feeders of the existing Kalkallo zone substation (KLO14 and KLO24) as well as supply risks from the Kalkallo zone substation itself.

- **Area Two – Wollert**: This is being considered under a separate Options Screening Report. The proposed Wollert zone substation aims to address supply risks impacting several western and northern feeders of the Epping zone substation, including supply risks from the Epping zone substation itself.

The entire Northern Growth Corridor was also assessed as a whole corridor to see whether alternative feasible options are available. For instance, a single zone substation solution (being either a new zone substation, or expansion of an existing zone substation like KLO) to serve both areas was assessed but deemed impractical due to the excessive feeder lengths required to span the corridor.

The Regulatory Investment Test for Distribution (RIT-D) is an economic cost-benefit assessment designed to identify the most credible option that addresses an identified need while maximising net economic benefits for stakeholders in the National Electricity Market (NEM). This involves a probabilistic planning methodology to account for rare but possible scenarios, such as extreme demand or outages, ensuring all credible options are considered.

This Options Screening Report (OSR) marks the first step in the RIT-D process, in line with clause 5.17 of the National Electricity Rules (NER)[7] version 235 published by the Australian Energy Market Commission (AEMC), and section 4.2 of the RIT-D Application Guidelines[8], 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 Standalone Alone Power System (SAPS) options (stand-alone or in conjunction with a network solution) that meet the identified need. Any credible non-network options will be assessed alongside the network options at the next stage of the RIT-D.

Submissions should be emailed to ritdconsultations@ausnetservices.com.au on or before 23 January 2026. In the subject field, please reference 'RIT-D OSR Beveridge'. AusNet's preference is that these submissions would be published on its website and AEMO's website. If you do not want your submission to be made public, please clearly stipulate this at the time of lodgement.

Assessments of the options and responses to this OSR will be presented in the Draft Project Assessment Report (DPAR), which we expect to publish before the end of 2025.

[7] National Electricity Rules (NER), Australian Energy Market Commission (AEMC), 2025
[8] Regulatory Investment Test for Distribution application guidelines , version 6, Australian Energy Regulator (AER), 2024

2. Introduction

The RIT-D is an economic cost-benefit test used to assess and rank potential investments capable of meeting the identified need. The purpose of the RIT-D is to identify the credible option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the NEM (the preferred option).

The publication of this OSR represents the first step in the RIT-D process in accordance with clause 5.17 of the NER[9] version 235, and section 4.2 of the AER's RIT-D Application Guidelines[10]. 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 SAPS option would be required to provide;
- 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.

[9] National Electricity Rules (NER), Australian Energy Market Commission - AEMC, 2025.
[10] Regulatory Investment Test for Distribution application guidelines, version 6, Australian Energy Regulator (AER), 2024.

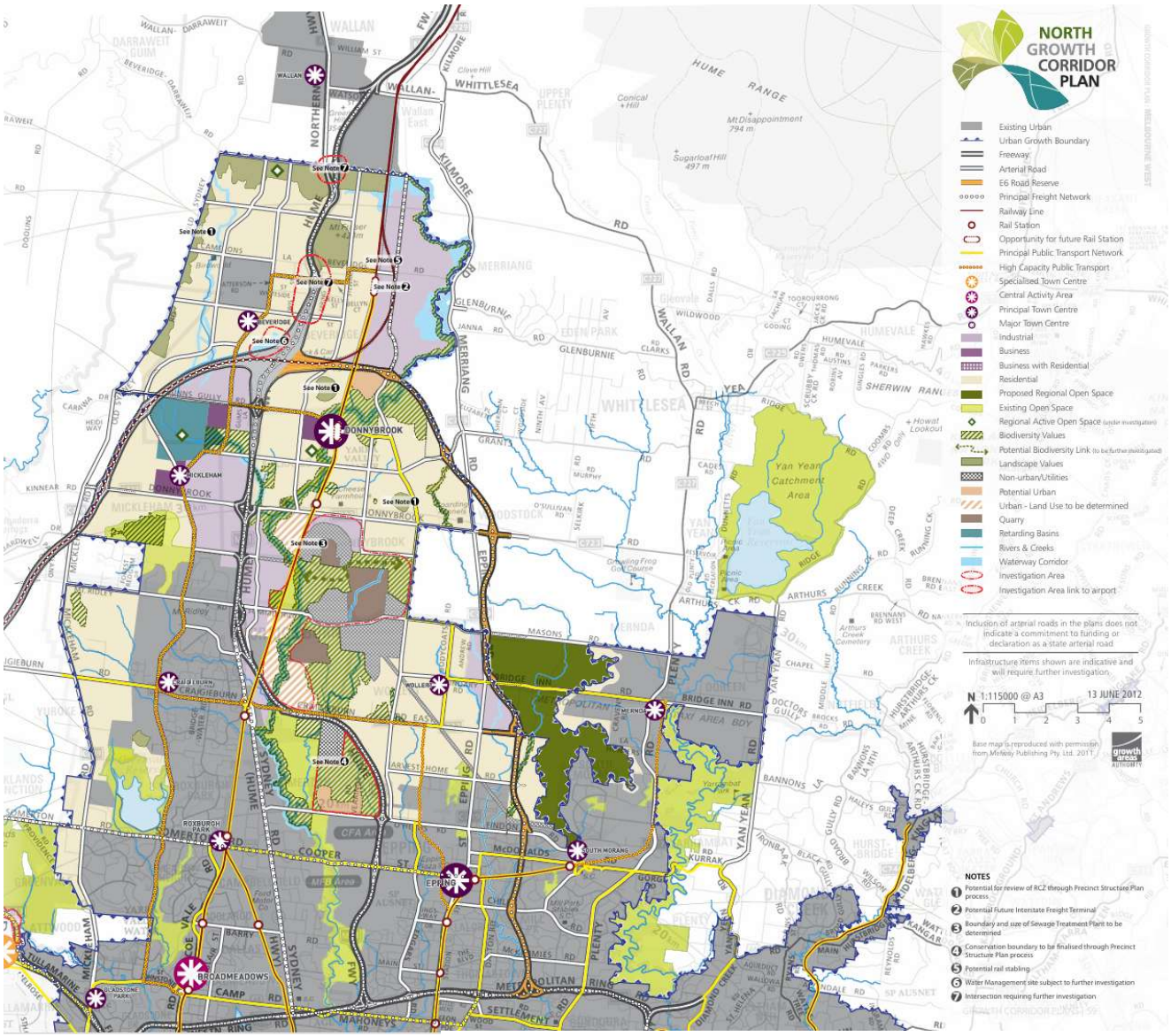
3. Background

This OSR relates to supply limitations on AusNet's Kalkallo zone substation and associated 22 kV distribution feeders KLO14 and KLO24 that provide electricity supply to the Beveridge area. The two feeders were originally designed to serve slow growing rural areas, characterised by long radial configurations with minimal adjacent tie points. However, due to rapid urban development in the region, they are now supporting a significantly expanding urban network.

Victoria in the Future (VIF2023)[11] states that Victoria is projected to add 3.8 million people from 2021 to 2051, reaching a population of 10.3 million[12]. This represents annual average growth of 126,000 people, at a rate of 1.5% per annum. The Mitchell Shire (which Beveridge is a part of) is expected to grow annually at an average of 8.1% between 2021 and 2036 – one of the higher growth areas across the Victorian local government areas (LGA).

The Northern Growth Corridor[13] on the urban fringes of Melbourne's northern suburbs, is a vast greenfield development area accommodating much of Melbourne's population and economic growth. The Victorian Planning Authority's development plans for the area are illustrated in Figure 1.

Figure 1 – Northern Growth Corridor



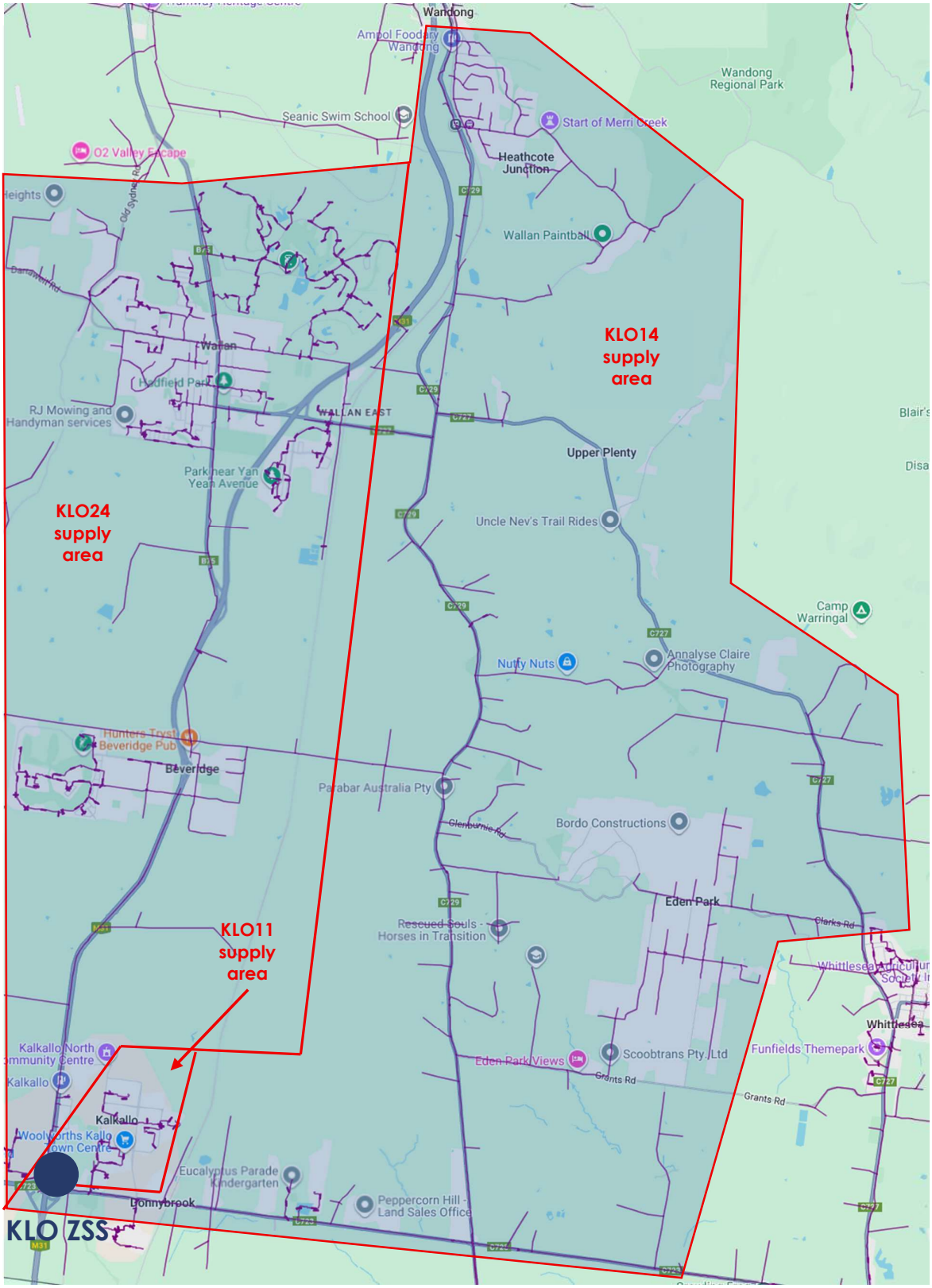
The area is supplied in part by AusNet's KLO Zone Substation. KLO supplies over 17,439 AusNet customers (via five 22 kV feeders KLO11, KLO12, KLO13, KLO14 and KLO24), and over 13,448 Jemena Electricity Network (JEN) customers

[11] Victoria in Future, Victorian Department of Transport & Planning, 2023.
[12] Victoria in Future 2023 (VIF2023), DataVic, 9th January 2024.
[13] Victorian Planning Authority – The North Growth Corridor Plan, Victorian Planning Authority.

(via four 22 kV feeders KLO13, KLO21, KLO22 and KLO23). Bushfire mitigation technology, specifically Remote REFCLs, has been deployed on KLO14 and KLO24.

Of particular relevance to this RIT-D are the parts of AusNet's distribution network that supply the satellite suburbs of Beveridge, Wallan, parts of Wandong and Whittlesea, and their surrounds, which are a part or adjacent to the Northern growth corridor. The existing 22 kV AusNet KLO14 and KLO24 distribution feeders supply these areas, as shown by Figure 2.

Figure 2 – KLO 22 kV network supplying Beveridge, Wallan, parts of Wandong and Whittlesea, and surrounds



AusNet has observed substantial growth in population in these areas and this growth is expected to continue, particularly with the announcement of the Victorian Government's approval of the Beveridge North West Precinct Structure Plan (PSP)[14]. This new precinct defined by the Beveridge North West PSP[15] will ultimately comprise of 15,000 new homes for approximately 47,000 people, eight schools and four town centres and will be a new suburb located within the Mitchell Shire, just north-west of Beveridge, 40km north of Melbourne CBD. In August 2025, the Victorian Government also approved the Beveridge Interstate Freight Terminal (BIFT) Stage 1a Planning Scheme Amendment (PSA), which enables construction to begin[16].

Mitchell Shire currently has an estimated population of 49,000 but is expected to grow to more than 170,000 people by 2041. This, coupled with the existing Beveridge Central PSP[17] and other adjacent approved and proposed PSPs, is part of the Victorian Government's long-term Greenfields plan to unlock land right across the state to deliver more than 180,000 new homes over the next decade.

[14] New Melbourne Mega-Suburb Gets Development Go-Ahead, Realestate.com.au, 5th August 2025.
[15] Beveridge North West Precinct Structure Plan , Victorian Planning Authority (VPA), 5th August 2025.
[16] Project Status Update – September 2025, Victorian Planning Authority (VPA), Northern Freight Precinct.
[17] Beveridge Central Precinct Structure Plan - VPA, Victorian Planning Authority (VPA), 17th January 2019.

4. Identified need

4.1. Description of the identified need

The identified need is to efficiently maintain a reliable supply of power to the customers in the Beveridge area. Forecast demand is expected to exceed the capacity of the Kalkallo zone substation from FY29 which currently supplies the area. The actual maximum demand on the distribution feeders KLO14 and KLO24 has already exceeded their asset ratings of 14.5 MVA each. Table 3 shows the levels of overload, after load transfers, for both the distribution feeders from FY26 and the zone substation from FY29, under system normal conditions that exceed their asset ratings.

Table 3 Do Nothing Base Case Forecast Summer 10PoE Overload (MVA)

OVERLOAD	FY26	FY27	FY28	FY29	FY30	FY31	FY32
KLO14	3.0	9.3	13.5	25.3	29.6	35.4	42.7
KLO24	2.7	4.9	6.6	8.4	10.2	12.1	14.8
TOTAL (Feeder)	**5.7**	**14.2**	**20.1**	**33.7**	**39.8**	**47.5**	**57.5**
KLO (N)	0.0	0.0	0.0	8.4	16.4	25.7	38.7
KLO (N-1)	14.7	32.7	40.9	56.8	64.8	74.1	87
TOTAL (ZSS) (N)	**0.0**	**0.0**	**0.0**	**8.4**	**16.4**	**25.7**	**38.7**
TOTAL (ZSS) (N-1)	**14.7**	**32.7**	**40.9**	**56.8**	**64.8**	**74.1**	**87**

AusNet is currently managing this overload with temporary diesel generators. **During the 2024–25 summer period, approximately 11.4 MWh of load was shed across KLO14 and KLO24 to prevent thermal overload**, supplemented by mobile generators providing 4.9 MW at KLO14 and 3 MW at KLO24. In preparation for the 2025–26 summer, works are underway to establish a 12 MW temporary generation site at Wallan, supporting KLO14 and KLO24 with 6 MW allocated to each feeder.

The forecasted demand in the Beveridge study area shows that there is currently no capacity available within the distribution feeder network with a shortfall of 5.7 MVA in FY26, forecast to rise to 57.5 MVA by FY32. In addition, the forecasted demand for the KLO zone substation with respect to its N and N-1 rating is also shown. All available load transfers have now been exhausted and there is no further opportunity to offload these feeders using the existing distribution network to remove the overload.

4.2. Quantification of the identified need

Under a Do-Nothing approach, the key cost to the community relates to the value of Expected Unserved Energy (EUE) multiplied by the Value of Customer Reliability (VCR).

We have calculated the EUE by determining the amount of energy that would not be able to be supplied by the KLO14 and KLO24 distribution feeders within the Beveridge area under system normal conditions with all assets in service.

We have calculated the EUE by using the maximum demand forecast of the feeder and the zone substation, by multiplying it by its normalised load duration curve to determine the energy at risk based on amount of time that the forecast load is above the system normal (N) rating of the feeder and the zone substation respectively, taking into account load transfer capacity. The total EUE is weighted according to a 30% weighting of the EUE calculated using a 10% PoE maximum demand, and a 70% weighting of the EUE calculated using a 50% PoE maximum demand.

We have calculated the locational VCR by adopting the AER's 2024 VCRs[18] for the different customer groups, weighting them by the mix of customers' annual energy consumption in the Beveridge area.

A material level of EUE is calculated for the distribution feeders KLO14 and KLO24 from FY26 and the zone substation KLO from FY29 as shown in Table 4.

Table 4 Do Nothing Base Case Forecast Expected Unserved Energy (EUE)

EUE	FY26	FY27	FY28	FY29	FY30	FY31	FY32
KLO14 (MWh pa)	10.3	280.7	3,092.8	24,246.1	42,693.1	69,353.1	102,520.6
KLO24 (MWh pa)	4.9	52.9	380.6	1,045.3	2,222.7	3,924.6	6,926.9
TOTAL (Feeder)(MWh pa)	**15.2**	**333.6**	**3,473.4**	**25,291.4**	**44,915.8**	**73,277.7**	**109,447.5**
TOTAL (Feeder) ($m, 2024 pa)	**0.7**	**15.2**	**158.3**	**1,153.1**	**2,047.7**	**3,340.5**	**4,989**
KLO (MWh pa)	0.7	13.8	32.3	133.2	470.5	2,101.1	7,327.4
TOTAL (ZSS) (MWh pa)	**0.7**	**13.8**	**32.3**	**133.2**	**470.5**	**2,101.1**	**7,327.4**
TOTAL (ZSS)($m, 2024 pa)	**0**	**0.6**	**1.4**	**5.9**	**20.8**	**92.7**	**323.2**

By FY32, the distribution feeders total expected unserved energy and its monetised supply risk on customers are forecast to be 109,447 MWh pa and $4,989 million (real $2024) respectively. Similarly, by FY32, the zone substation expected unserved energy and its monetised supply risk on customers are forecast to be 7,327 MWh pa and $323.2 million (real $2024) respectively.

4.3. Summary of identified network need

AusNet has undertaken a probabilistic planning approach to assess the energy at risk (load not being supplied) if no mitigation action is undertaken and whether it is economic to invest in risk mitigation action to reduce the forecast service level risk. With respect to distribution feeders, AusNet has identified that approximately of additional capacity or demand reduction of 57.5 MVA is required by FY32 rising from a present need of 5.7 MVA. . With respect to the KLO zone substation, approximately 38.7 MVA of additional capacity or demand reduction is required by FY32 rising from 8.4 MVA in FY29 through network augmentation or alternative non-network approaches such as demand management, embedded generation and/or storage to enable the ongoing reliable supply of electricity to the Beveridge area.[19]Addressing this identified capacity constraint will help to ensure that AusNet is able to prudently and efficiently meet forecast growth within the Beveridge area to:

- support economic growth anticipated for this region;
- support the electrification of homes, businesses and transport[20]; and
- meet our customers' expectations that AusNet should provide a reliable electricity supply and take prudent and efficient actions to minimise unplanned outages.

Feedback from our customer engagement has underscored the importance of ensuring that we provide a 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 different needs such as

[18] Values of Customer Reliability - Final report, Australian Energy Regulator (AER), 2024
[19] Total overloads in Table 1.
[20] Refer to Victoria State Government, 'Gas Substitution Roadmap – Update: Victoria's Electrification Pathway.'

transport, telecommunications, working from home, maintaining comfort during extreme weather conditions, and to meet health needs.

4.4. Factors underpinning the identified need

Key factors underpinning the quantification of the identified need include:

- Demand forecasts;
- Load duration curves;
- Asset ratings;
- Asset unavailability;
- Load transfer capacity;
- Demand management; and
- Network support (temporary generation)

In addition to the factors set out above that underpin the identified need, some assumptions will be required to quantify the costs and benefits of credible options that would address the identified need. These further assumptions will be provided in the DPAR, which will set out the cost-benefit analysis for each of the credible options.

4.4.1. Distribution Feeder Demand forecasts

The forecast maximum demands for the two 22 kV distribution feeders supplying the Beveridge area being KLO14 and KLO24, were developed by AusNet in 2025 and are summarised below in Table 5 and Table 6 respectively.

Table 5 Do Nothing Base Case Forecast KLO14 Maximum Demand (MVA)

KLO14	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Summer 10PoE	23.6	29.9	34.1	45.9	50.3	56.0	63.3
Summer 50PoE	19.6	25.3	29.3	40.1	43.8	50.3	57.3
Winter 10PoE	17.4	25.8	33.6	46.8	55.1	64.2	74.9
Winter 50PoE	12.1	20.2	27.8	40.8	48.3	57.5	67.8

Table 6 Do Nothing Base Case Forecast KLO24 Maximum Demand (MVA)

KLO24	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Summer 10PoE	23.5	25.7	27.4	29.2	31.0	32.9	35.6
Summer 50PoE	20.8	22.7	24.2	25.7	27.4	29.2	31.3
Winter 10PoE	20.6	22.8	24.9	26.6	28.7	30.8	33.6
Winter 50PoE	19.4	21.6	23.6	25.3	27.2	29.1	31.7

The forecast maximum demand for the KLO zone substation was developed by AusNet in 2025 and is summarised below in Table 7.

Table 7 Do Nothing Base Case Forecast KLO Maximum Demand (MVA)

KLO	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Summer 10PoE	83.7	94.2	102.4	118.3	126.3	135.6	148.6
Summer 50PoE	68.3	77.9	84.7	99.7	106.9	115.6	127.0

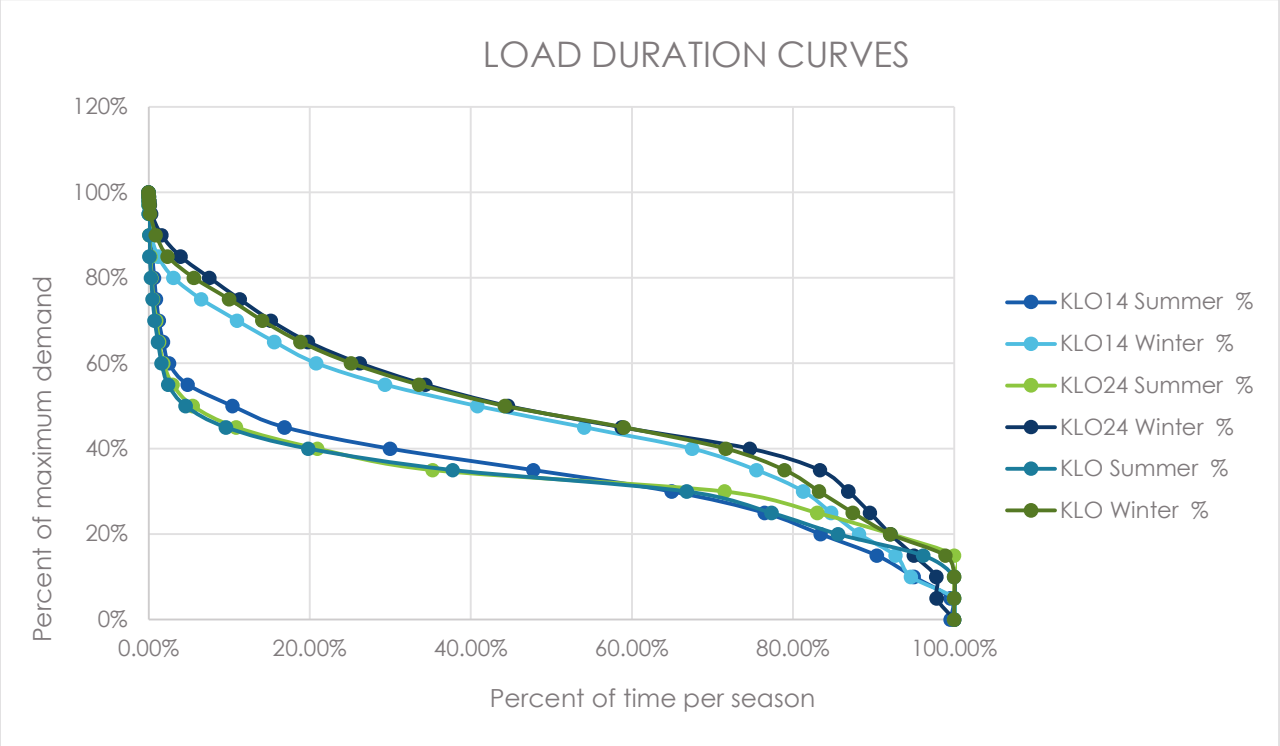
Winter 10PoE	79.9	92.4	103.0	120.4	129.7	142.6	159.4
Winter 50PoE	72.3	83.8	93.4	109.8	118.6	129.8	143.8

4.4.2. Load-duration curves

Load-duration curves are plots of the demand (normalised as a percentage of the maximum demand for the season – (summer and winter) against the percentage of time for that season. The load values are plotted in the order of decreasing magnitude such that any point on the load-duration curve represents the total duration when load is expected to be greater than or equal to that load value. At times when the load-duration curve multiplied by the forecast maximum demand exceeds the rating for that season, the area above contributes to the EUE.

Figure 3 shows the load duration curves (summer and winter) for KLO14, KLO24 and KLO zone substation.

Figure 3 – KLO, KLO14 and KLO24 Load Duration Curves



4.4.3. Distribution Asset Ratings

The ratings of the two distribution feeders as well as KLO zone substation that supply the Beveridge area are presented in Table 8.

Table 8 Do Nothing (Base Case) Distribution Ratings (MVA)

ASSET	SUMMER	WINTER
KLO14	14.5	14.5
KLO24	14.5	14.5
KLO	97.5	97.5

4.4.4. Asset unavailability

AusNet only considers the EUE attributed to system normal operating conditions as material, that is when the asset demand exceeds the asset rating with all assets in service. By comparison, the magnitude of the EUE under single contingency conditions is considered immaterial due to the size of the asset overload under system normal conditions. Hence asset unavailability is not relevant to this RIT-D.

4.4.5. Load transfer capacity

The forecast load transfer capacity for the two 22 kV distribution feeders supplying the Beveridge area being KLO14 and KLO24, are summarised below in Table 9 and Table 10 respectively.

Table 9 Do Nothing (Base Case) Forecast KLO14 Load Transfer Capacity (MVA)

KLO14	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Transfer Capacity	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 10 Do Nothing (Base Case) Forecast KLO24 Load Transfer Capacity (MVA)

KLO24	2026	2027	2028	2029	2030	2031	2032
Transfer Capacity	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The forecast load transfer capacity for the KLO zone substation is summarised below in Table 11.

Table 11 Do Nothing (Base Case) Forecast KLO Load Transfer Capacity (MVA)

KLO	2026	2027	2028	2029	2030	2031	2032
Transfer Capacity	3.8	0.0	0.0	0.0	0.0	0.0	0.0

The transfer capacity of both feeders at peak demand is zero, given both adjacent feeders are overloaded for the entire period providing no back up for each other. The only available transfer path is from KLO14 (REFCL) to DRN22 (Non-REFCL), which is permitted exclusively on non–Total Fire Ban (TFB) days. However, this transfer is prohibited during TFB days, which typically coincide with peak summer demand periods. At the zone substation level, transfer capacity is similarly constrained except for 2026 (3.8MVA), this includes transfers on Jemena feeders. The Kalkallo zone substation is expected to exceed its rating, under system normal conditions, from FY29, with no margin to support additional load especially under contingency conditions.

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 options for addressing the identified need that maximise 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.

AusNet proposes to investigate and evaluate the following credible network options to address the identified need:

1. Build a new two-transformer zone substation at Beveridge with two new feeders
2. Install a third transformer and bus at Kalkallo zone substation with two new feeders going North towards Beveridge

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

4.4.6. Existing Demand Management

The existing available demand management of the two distribution feeders that supply the Beveridge area as well as KLO zone substation are presented in Table 12.

Table 12 Do Nothing (Base Case) available asset demand management (MVA)

	KLO14	KLO24	KLO
Demand management	0.2	0.3	0.4

Although demand management can be contracted for the assets mentioned, customer participation is voluntary. As a result, the full existing demand management capacity may not be available during peak demand. However, for energy-at-risk modelling, we have assumed that the full existing demand management capacity is available.

4.5. Option 0: Do nothing

The Do Nothing option assumes that AusNet would not undertake any investment, outside of normal operational and planning processes for managing peak demand and thermal overloading. This option establishes the base level of risk (base case) and provides a basis for comparing other credible options.

While this option does not entail any upfront capital costs, it exposes customers to the continuing and increasing risk of network outages as it does not address the identified need, represented by the EUE in Table 4, as a result of demand exceeding the available network capacity.

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.

4.6. Option 1: New Beveridge zone substation

This option is to install a new 66/22 kV zone substation with 2 x 33 MVA transformers and two 22 kV busbar and two new 22 kV feeder exits connected into the existing 22 kV distribution network, at a site located close to the existing 66 kV sub-transmission line[21] on the western side of Beveridge. The zone substation installed would be to AusNet's standard design with provision for additional transformer and bus in the future. We expect commissioning of the zone substation can be completed by the end of FY28 based on an immediate start of the design and construct activities.

This proposed option addresses the identified need by removing the existing overload on KLO14 and KLO24 and adding the forecast demand growth onto the new feeders at the Beveridge zone substation.

Figure 4 below shows a possible area highlighted with a red outline within which the Beveridge zone substation site could be procured and established. Further detailed site investigation will be required before an exact site is selected.

Figure 4 – Possible Beveridge zone substation site

The estimated capital cost of this option is $82.6 million (real, $2024).

[21] SMTS-KMS 66 kV line.

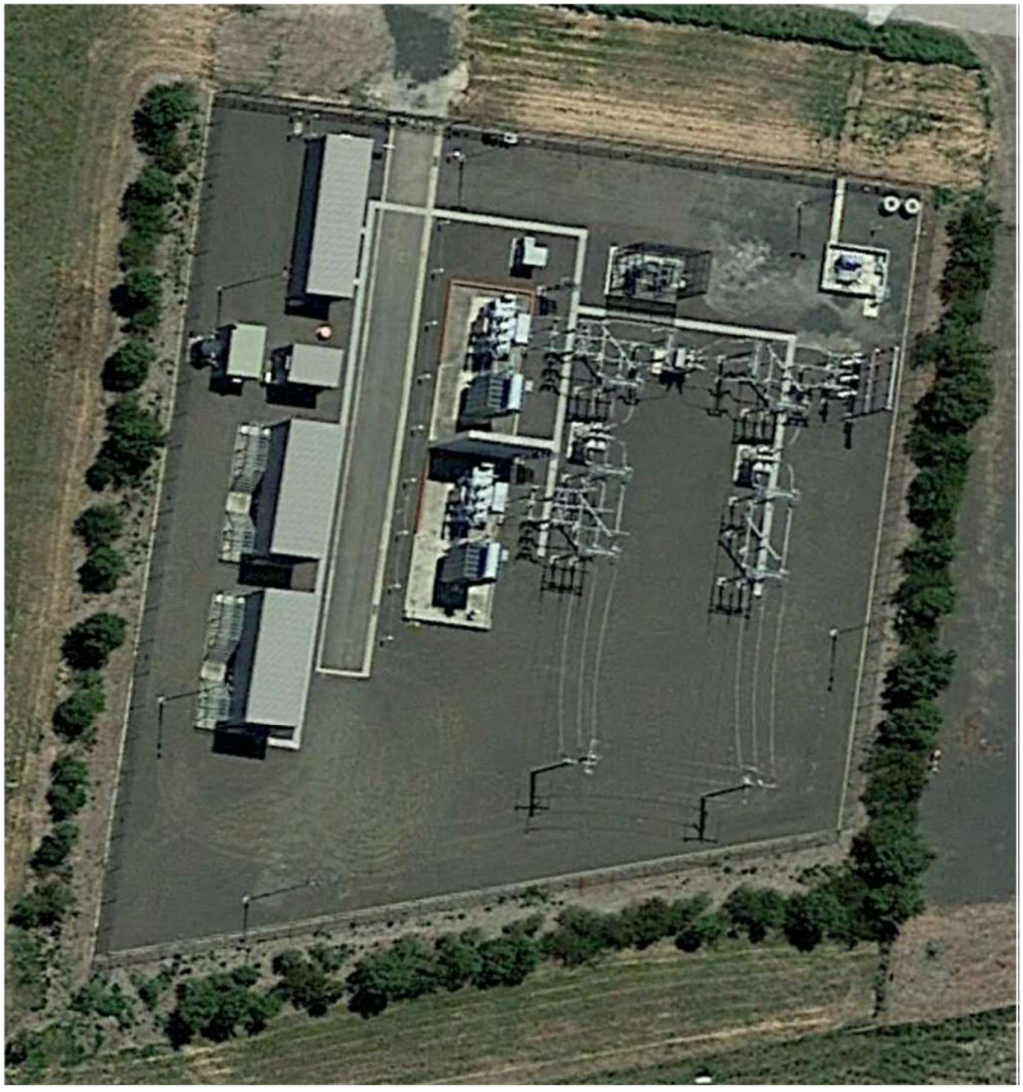
4.7. Option 2: Install a third transformer,22kV switchboard and feeders at KLO

This option involves installing a third 66/22kV 33 MVA transformer and third 22 kV bus at KLO and two new 22 kV feeder exits connected into the existing 22 kV distribution network at Beveridge using underground cables from KLO to avoid overhead line constructability issues imposed by limitations within the road reserves.

This proposed option addresses the identified need by removing the existing overload on KLO14 and KLO24 and adding the forecast demand growth onto the new feeders at KLO. This option would allow the EUE to be removed completely until around 2030, after which the viability of augmentation closer to the Beveridge supply area could be considered at that time.

Figure 5 shows a satellite view of KLO with the available space for a third transformer and bus.

Figure 5 – Existing Kalkallo (KLO) zone substation site



The new longer 22 kV distribution feeders will be required in this option as KLO zone substation is located approximately 11 km from the Beveridge area. The distribution feeder lengths in this option will be significantly longer as compared to the average feeder lengths required from the proposed new Beveridge zone substation as proposed in Option 1. Furthermore, the new feeders from KLO will need to be underground cables. Previous proposals for overhead infrastructure along the Hume Freeway have been declined by relevant authorities , citing alignment issues with their long-term expansion plans.

The estimated capital cost of this option is $74.1 million (real, $2024).

Although the capital expenditure for Option 2, which involves installing a third transformer and switchboard at KLO and constructing two feeders to Beveridge is lower than Option 1, which is the preferred solution, Option 2 comes

with significant execution challenges. The primary challenge in executing this option lies in the requirement to utilise the Hume Freeway corridor as the easement. Relevant road management authority does not permit overhead infrastructure along this route, necessitating underground installation. Furthermore, the project timeline is materially impacted by the protracted and multifaceted approval processes mandated by the road and rail management authorities. In addition, there are considerable risks associated with securing easements from private landowners across a corridor exceeding ~11 kilometres, which may introduce further delays and legal complexities.

4.8. Option 3: Non-network or SAPS solutions

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 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 EUE 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 the next section of this document.

5. 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 performance 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 non-network service; and
- The information that a non-network proponent should provide to AusNet to explore the potential provision of a non-network service.

5.1. Required performance characteristics

Table 13 sets out the dispatchable load reduction/generation/storage capacity required from a non-network or SAPS option, located within the Beveridge area by year to address limitations due to feeders. This table provides an indication of the maximum number of operating hours per year, and the expected amount of energy needing to be supported by the option. This information (together with Figure 3) provides an indication of the required operating profile to address the identified need in its entirety, 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 13 Performance requirements of a non-network solution (Feeders)

YEAR	CAPACITY REQUIRED (MW)	MAXIMUM DURATION (HRS PA)
FY26	5.5	30
FY27	13.8	796
FY28	19.5	2,831
FY29	32.7	5,666
FY30	38.6	6,725
FY31	46.1	7,431
FY32	55.8	7,431

A non-network option must be capable of reliably supplying or managing load under a range of conditions and scenarios. The non-network solution will contribute to reliability to the extent that it addresses the EUE risks arising from the identified need.

If the non-network option is a 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.

5.2. Information to be included in non-network solution proposals

Non-network service providers interested in alleviating the network limitations quantified in this report 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 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).
- A detailed description of the services to be provided, including:
  - Size and capacity (MW/MVA/MWh).
  - Location(s).
  - Frequency and duration.
  - Type of action or technology proposed, including response / ramp rate information, where applicable.
  - Proposed dispatching arrangement (e.g. telephone, web-based trigger, automated means via RTU).
  - Availability and reliability performance details.
  - 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).
  - 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).
- Evidence and track record proving capability and previous experience in implementing and completing projects of the same type as the proposal.
- Preliminary assessment of the proposal's impact on the network.
- Breakdown of the lifecycle costs 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 non-network 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).
- Letters of support from partner organisations.
- 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 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 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.

5.3. Potential payments to non-network proponents

At this stage, the preferred network option has not yet been determined. However, the maximum annualised capital expenditure that could be deferred by contractually engaging a non-network solution is $5.55 million per annum, assuming Option 1 is the preferred network option.

The payment for a non-network solution may vary according to availability, capacity, dispatch duration and firmness of the non-network service, its ability to address the identified need, 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 and SAPS 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 ritdconsultations@ausnetservices.com.au. In the subject field, please reference 'RIT-D OSR Beveridge'.

6. 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 14 shows how each of these requirements have been met by the relevant section of this report.

Table 14 Compliance with regulatory requirements

REQUIREMENT	SECTION
Clause 5.17.4 of the NER, Non-network options report must include the following:	
(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 4.4
(3) if available, the relevant annual deferred augmentation charge associated with the identified need;	Section 5.3.
(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 5.
(i) the size of load reduction or additional supply;	
(ii) location;	
(iii) contribution to power system security or reliability;	
(iv) contribution to power system fault levels as determined under clause 4.6.1; and	
(v) the operating profile;	
(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 0.
(6) for each potential credible option, the RIT-D proponent must provide information, to the extent practicable, on:	Section 0.
(i) a technical definition or characteristics of the option;	
(ii) the estimated construction timetable and commissioning date (where relevant); and	
(iii) the total indicative cost (including capital and operating costs); and	
(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 7.

7. Submissions and next steps

7.1. 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 5.2, prospective non-network service providers interested in alleviating the network limitations outlined in this OSR are advised to begin engagement with AusNet as soon as possible.

All submissions and enquiries should be directed to:

Email: ritdconsultations@ausnetservices.com.au

Submissions are due on or before 23 January 2026 and should refer to 'RIT-D OSR Beveridge' in the subject heading.

Submissions will be published on AusNet's and AEMO's websites. If you do not wish to have your submission published, please clearly stipulate this at the time of lodging your submission.

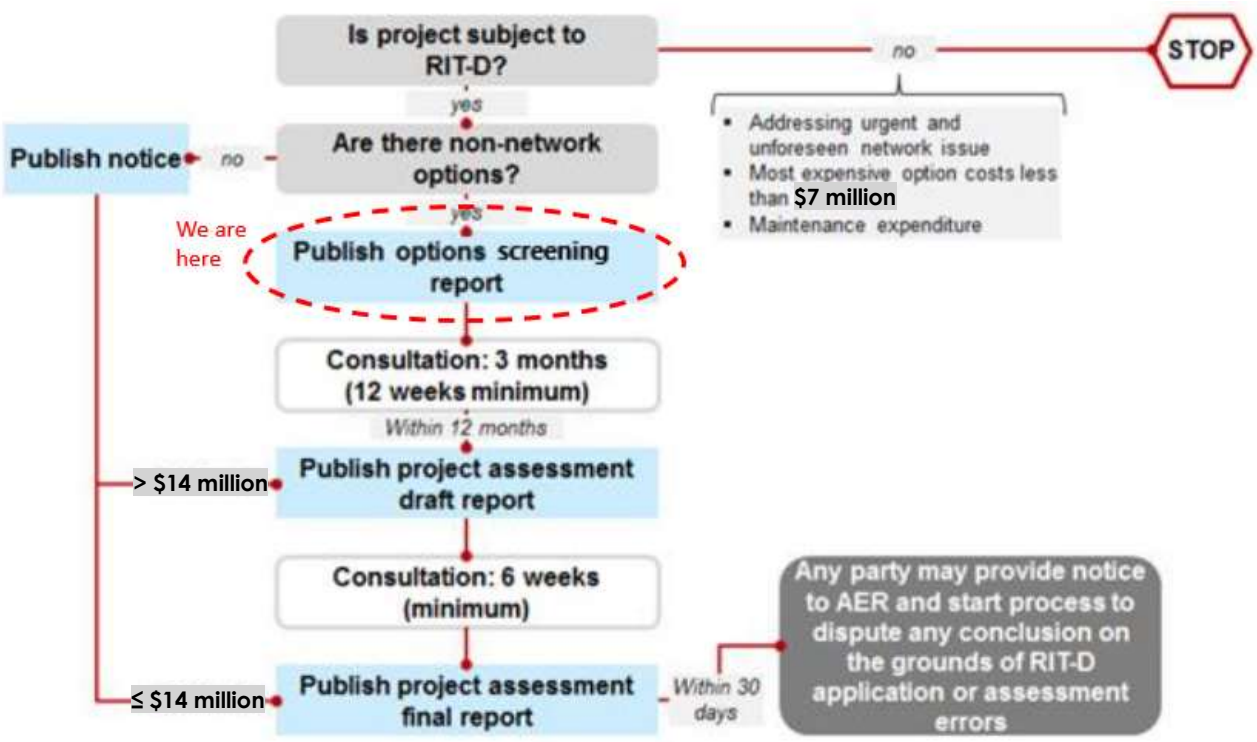
7.2. Next stage of RIT-D process

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 shortly after consultation on this OSR closes.

Appendix – RIT-D assessment and consultation process[22]



[22] Regulatory investment test for distribution, Application guidelines, Section 4, Australian Energy Regulator (AER), November 2024.

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