RIT-D Options Screening Notice

Providing supply to the South Creek West Residential Growth Area

7 November 2024

Endeavour Energy

POWER together

1. Introduction

The South Creek West residential growth area is located within the South West of Sydney. It is approximately 40km south-west of Parramatta and 8km south of the new Western Sydney Airport. The area is currently largely undeveloped and has been recently rezoned for residential housing.

The South Creek West residential growth area includes the planned Oran Park Town Centre to the north of the existing Oran Park residential area and the planned new residential development areas at Lowes Creek Marylands, Pondicherry, Greenways and Cobbitty South Creek West.

These new residential areas will include their own town centres, schools, community facilities and future small scale commercial and limited industrial zoned spaces. The overall objective of the development area is to provide new residential housing in south-west Sydney and it has been a focus area for NSW government and local government. In total, the South Creek West residential growth area is estimated to include 20,500 new residential dwellings and to require 172MVA of electricity supply capacity by 2050.

We are commencing this RIT-D to determine the most efficient means of providing supply to the South Creek West residential growth area. Although we expect there to be significant market benefits associated with providing supply to the South Creek West residential growth area, we consider the need for this investment a 'reliability corrective action' due to our regulatory obligations to connect new load. These regulatory obligations are set out in the box below.

'Identified need' for this RIT-D

We have initiated this RIT-D to investigate, consult and determine the most efficient provision of supply to the South Creek West residential growth area.

Endeavour Energy is required to connect customers under section 5.2.3(d) of the National Electricity Rules (NER), which state that "A Network Service Provider must:

> (1) Review and process applications to connect or modify a connection which are submitted to it and must enter into a connection agreement…
>
> (6) Permit and participate in commissioning of facilities and equipment which are to be connected to its network in accordance with rule 5.8;"

We therefore consider the identified need for this investment to be a 'reliability corrective action' under the RIT-D since investment is required to comply with the above NER obligations.

The timing of the identified need for this RIT-D, and so the required timing for credible options to address the need, is determined by when the expected load requiring connection will exceed the existing network capacity. This commenced in 2023/24, and based on the connection enquiries received to date, customer servicing requirements in this area are expected to continue to grow.

This options screening notice sets out the reasons why we consider that non-network solutions and stand-alone power systems (SAPS) are unlikely to form a potential credible option on a standalone basis or form a significant part of a potential credible option, to meet the identified need for the South Creek West residential growth area, i.e., in accordance with NER clause 5.17.4(c). It represents the first formal stage of the RIT-D assessing how to most efficiently provide supply to major new loads in the South Creek West residential growth area.

The second formal stage of this RIT-D is a Draft Project Assessment Report (DPAR), which includes a full net present value (NPV) options assessment.

If you have any comments or enquiries regarding this report, please send them to the Portfolio Management office at consultation@endeavourenergy.com.au.

2. Key assumptions underpinning the identified need

This section sets out the key assumptions and methodologies that underpin the identified need for this RIT-D. These assumptions have been used in making our determination that there will not be a potential credible non-network option, or SAPS option, on a standalone basis, or that forms a significant part of a potential credible option, i.e., in accordance with NER clause 5.17.4(c).

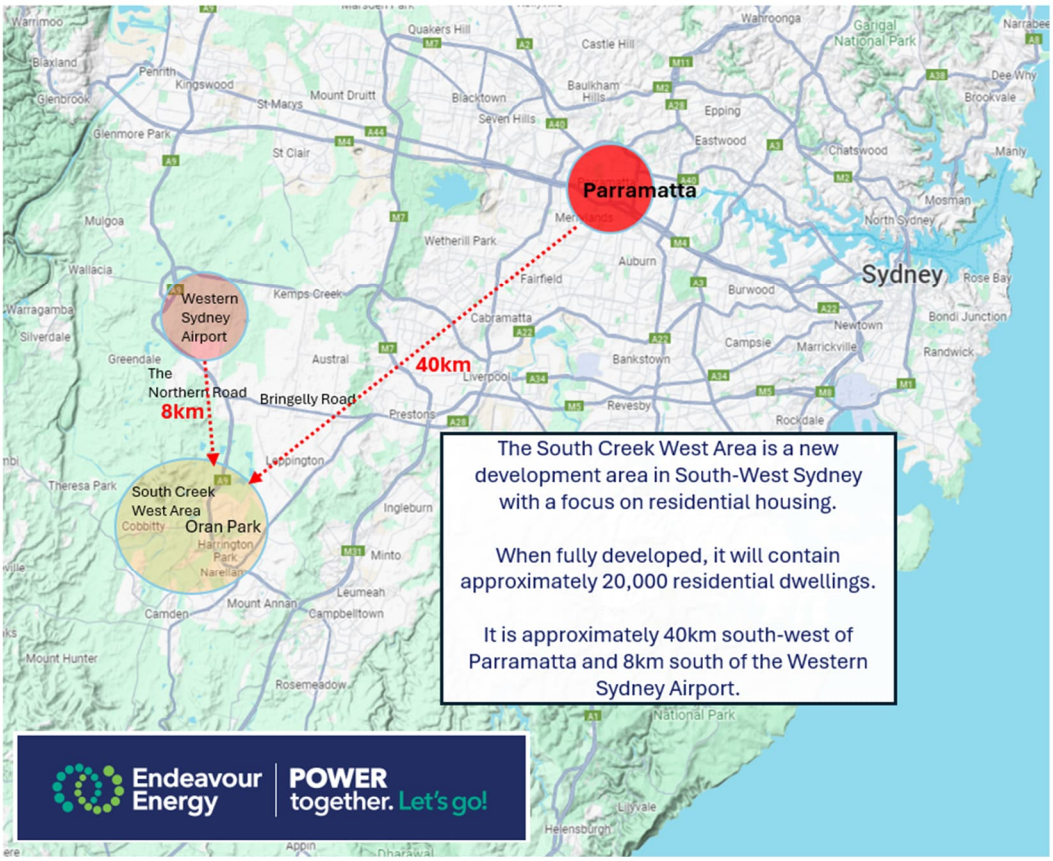
2.1 Relevant area of our network

The South Creek West residential growth area is located approximately 40km south-west of Parramatta and approximately 8km south of the new Western Sydney Airport.

The area has been identified by the NSW Department of Planning and Environment (DPE) for future urban development,[1] and is expected to be fully developed with residential dwellings by 2050. This will include complementary developments including town centres, schools, community facilities and future commercial and limited industrial spaces.

Figure 1 below shows the geographic location of the South Creek West residential growth area in relation to Parramatta and the new Western Sydney Airport.

Figure 1 – Location of the South Creek West residential growth area in relation to Parramatta



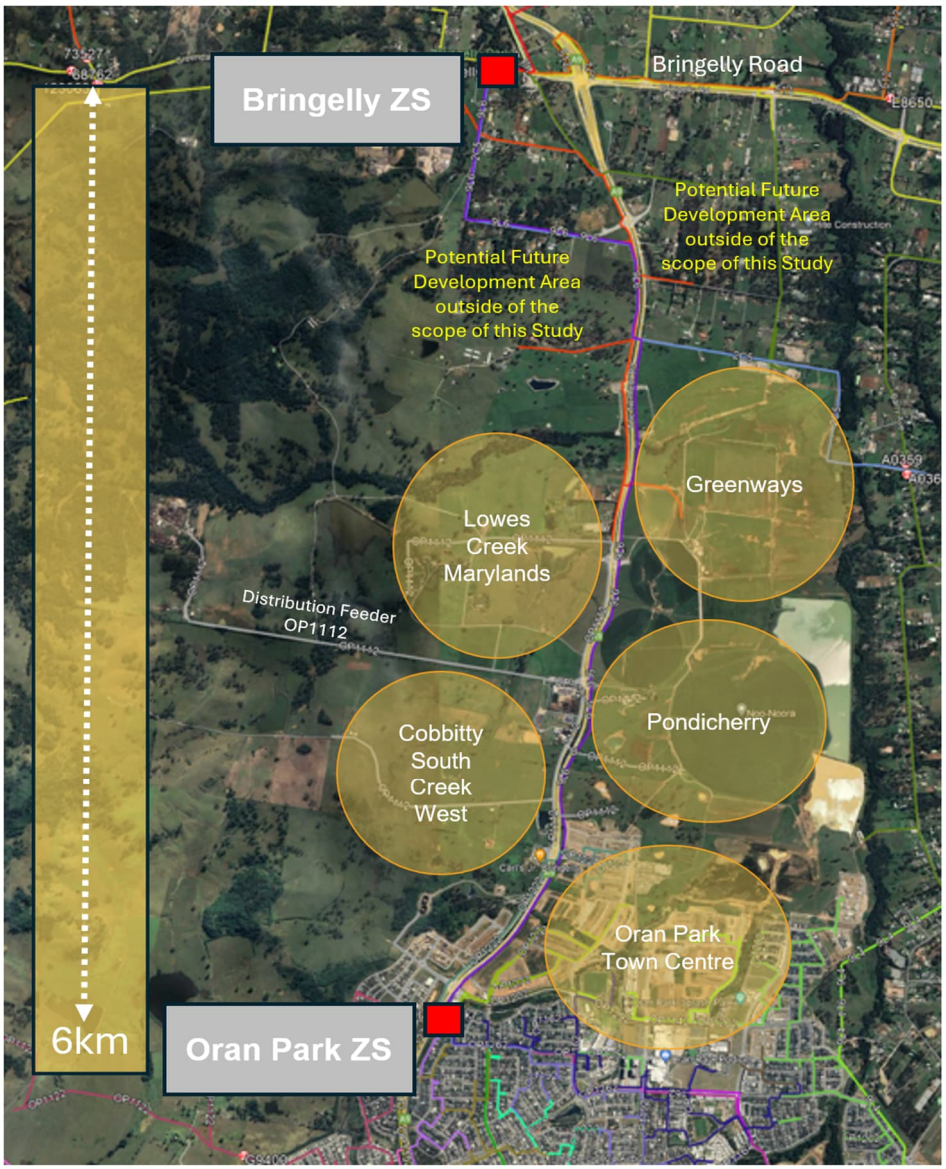
[1] NSW Department of Planning, Housing and Infrastructure, see: https://www.planning.nsw.gov.au/plans-for-your-area/priority-growth-areas-and-precincts/south-west-growth-area/south-west-growth-area-plan, accessed 30 July 2024.

The South Creek West residential growth area is wholly within the Camden Local Government Area.

Figure 2 below shows the location of several proposed residential development precincts within the South Creek West residential growth area. The existing land use, as can be seen from figure 2, it is currently largely undeveloped rural land. The area is located between the existing Bringelly and Oran Park Zone Substations. These Zone Substations are approximately 6km apart.

The development details including the number of residential lots and demand forecast for the proposed residential development precincts are presented and analysed further in this document.

Figure 2 – Location of residential development precincts within the South Creek West residential growth area



2.2 Load characteristics and demand forecast

The South Creek West residential growth area will comprise land to be zoned primarily for residential use and will also include community facilities such as schools, sporting facilities and town centres with shopping and commercial use. The land will be subdivided into residential lots subject to receiving approval from Local Government.

Based on the proposed precincts, the South Creek West residential growth area will include 20,000 residential lots by 2050 and will require 172MVA of electricity supply capacity.

Table 1 below shows the proposed South Creek West residential growth area precincts and the corresponding housing lots estimated to be completed by 2050. The naming of the precincts presented in the table are based on application details from the proponents of the development and may not be the final place-naming. The estimate of housing lots is subject to Local Government approval and are presented here as they are the basis for the demand forecast, noting that assumptions concerning the timing and realisation of the total number of residential housing lots are also included in the demand forecast. Further details on the estimate of residential housing lots are provided by the Urban Development Plan for the South West Growth Area.[2]

Table 1 – South Creek West residential growth area precinct development summary

Proposed Precinct	Estimate of total residential housing lots by 2050	Details
Lowes Creek Marylands	7,000	In addition to the residential housing lots, there are planned school and community facilities.
Oran Park Town Centre	2,000	Medium density apartments with schools, community facilities and outdoor recreational spaces.
Pondicherry	2,800	Residential housing lots, town centre, community facilities and schools.
Greenways	4,900	Development to also include schools and some limited commercial and enterprise developments.
Cobbitty South Creek West	3,800	Development to also include community and sporting facilities.

Table 2 shows the assumptions that have been used to develop the demand forecast from the underlying residential growth plans for the area.

[2] See NSW Department of Planning and Environment, *A Guide to the South West Growth Area and updated Structure Plan*, December 2022.

Table 2 – South Creek West residential growth area demand forecast assumptions

Assumption	Value and unit of measure
Average Diversified Maximum Demand	5.4kVA per Lot
Town Centre Shopping Village	3.0MVA
School K-12	1.0MVA
School K-6	0.75MVA
Water Supply Services	0.3MVA
Residential Diversity Factor	0.8
Commercial Diversity Factor	0.6

Table 3 below shows the central demand forecast for the South Creek West residential growth area based on the development plans and the assumptions set out in table 2.

Table 3 – South Creek West residential growth area central demand forecast

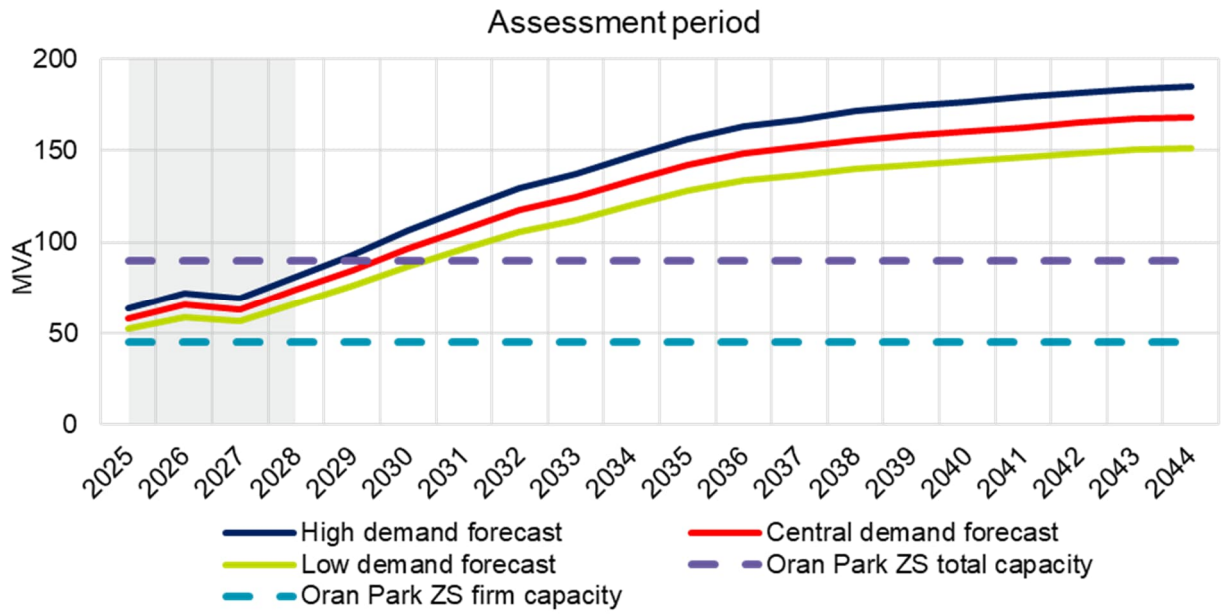
Central demand forecast (MVA)	2024	2025	2026	2027	2028	2029	2030	2031	2032		2037	2042
Existing Oran Park	48.4	53.7	56.3	58.5	60.6	62.8	65.2	67.3	70.3		71.1	71.1
Oran Park Town Centre	0.3	2.4	4.7	7.9	10.6	13.2	15.0	16.0	17.2		21.4	21.4
Pondicherry	0.4	1.9	3.2	5.1	6.8	8.3	9.7	10.7	11.8		13.0	13.0
Greenways	0.0	0.0	0.0	0.2	1.3	2.9	4.8	7.2	9.5		16.5	22.2
Cobbitty South Creek West	0.0	0.0	0.0	1.3	2.7	4.1	5.5	6.7	7.9		15.2	16.7
Lowes Creek Marylands	0.0	0.0	1.3	3.0	4.8	6.6	9.4	12.2	13.8		20.4	26.4
Total demand	**49.1**	**58.0**	**65.5**	**63.0**	**73.8**	**84.9**	**96.6**	**107.2**	**117.5**		**151.8**	**165.1**

Based on the central demand forecast set out in Table 3, we have developed additional demand forecasts by applying a 10% increase in MVA to derive a high demand forecast, and a 10% decrease in MVA to derive a low demand forecast. This range is designed to encompass a variety of factors which may change

demand, such as variations in the timing of developments or economic conditions. Endeavour Energy applies a +/-10% range for residential load, to reflect the typical degree to which actual residential load has historically varied from forecast residential load in Endeavour Energy's network.

Figure 3 below shows the firm and total capacity at the existing Oran Park ZS that currently serves the South Creek West residential growth area (discussed further below) and the low, central and high forecasts of the growth in demand for this area. These demand forecasts have been used to inform the scenarios that will be adopted in assessing the credible options (see section 2.6).

Figure 3 – Capacity and forecast peak demand at Oran Park ZS



2.3 Expected pattern of use

Due to the similarities in the expected residential housing development proposed in the South Creek West residential growth area and the adjacent Oran Park ZS supply area, we have used the pattern of use from the Oran Park ZS to analyse the South Creek West residential growth area. This includes applying the same load duration curve and peak summer day profile as at Oran Park.

We expect that the demand profile will be similar, including the time of day and day of week demand profiles and the seasonal variation in demand. The penetration of rooftop solar is expected to be similar and we have assumed the solar penetration to be similar to Oran Park ZS. Many of the community facilities, sports complexes and shopping centres are expected to have similar patterns of use as Oran Park. We are confident in our use of Oran Park ZS to represent the South Creek West residential growth area pattern of use.

Figure 4 shows the Load Duration Curve (LDC) for Oran Park ZS that we have applied to the South Creek West residential growth area.

Figure 4 – Load Duration Curve for Oran Park ZS

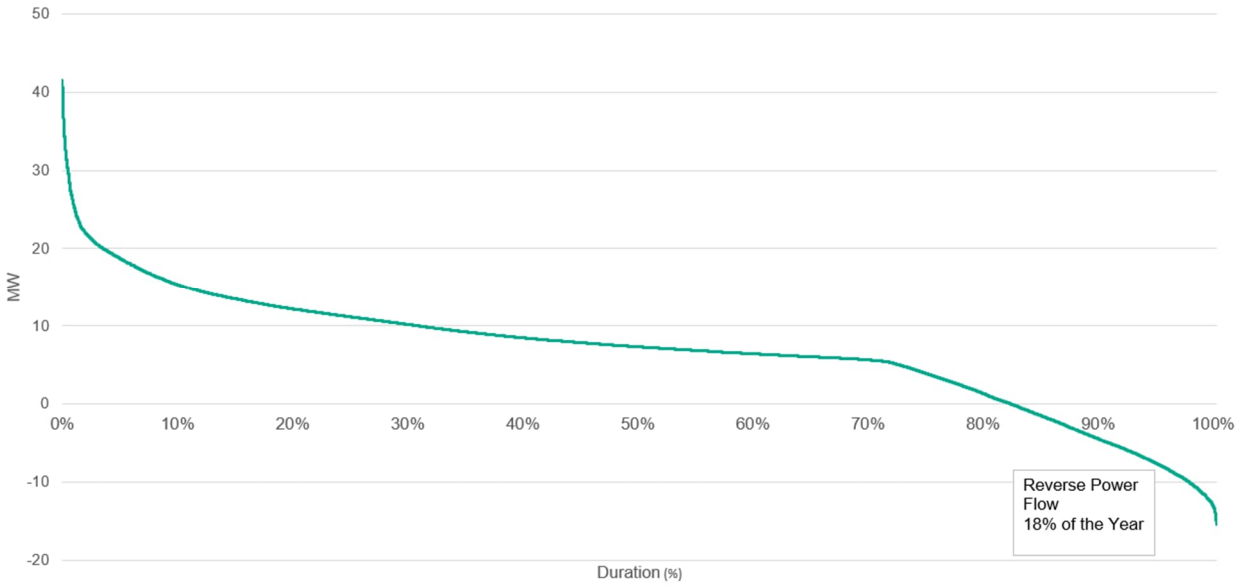
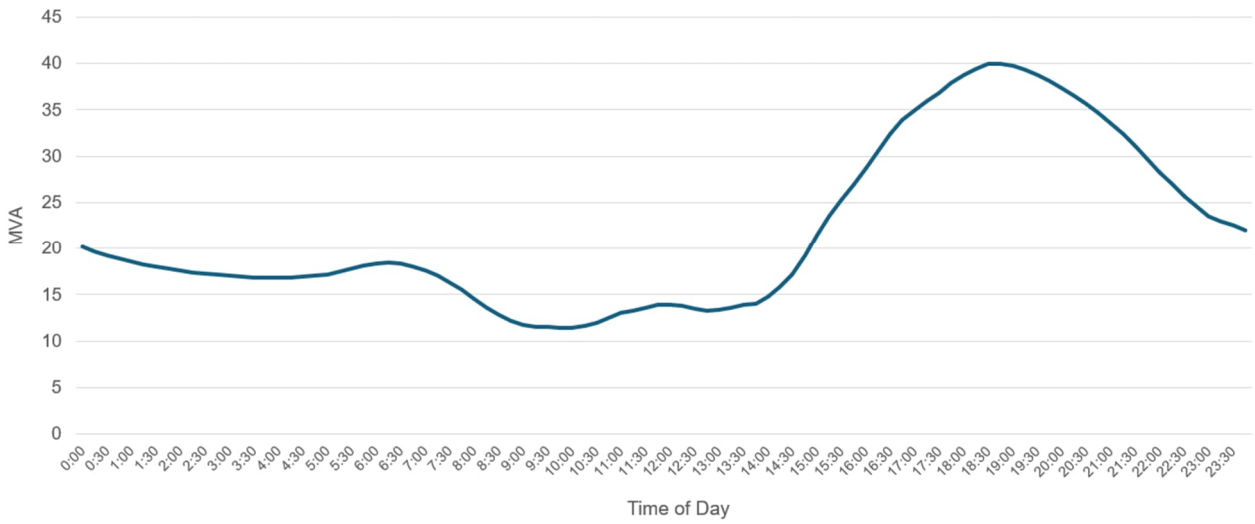


Figure 5 shows the peak summer day profile for Oran Park ZS, we are using the load profile shape for our study of the South Creek West Residential Growth area. It shows that the peak period of the day is expected to be 6.30pm, resulting from air conditioning demand in the evening of a hot summer day. This demand profile is from a day with a maximum temperature of >35 degrees. The impact of the solar generation within the area is shown by this time of day profile with the peak being later in the day after the peak generation expected from rooftop solar.

Figure 5 – Peak summer day profile for Oran Park ZS



2.4 Existing network

The South Creek West residential growth area is currently serviced by the Oran Park ZS by a single 11kV distribution feeder (OP1112). This feeder is capable of servicing the initial development area until 2026/27, based on the demand forecast for the area.

The Bringelly ZS is approximately 3km to the north of the centre of the South Creek West residential growth area and although it has an 11kV feeder that extends into the area, Bringelly ZS has no available capacity at the power transformer level to supply this demand. Bringelly ZS is dedicated to the development area to the north which includes the Aerotropolis Core Precinct.

Oran Park ZS has two 45MVA 132/11kV transformers and is supplied via two 132 kV feeders (9L3 and 9L6). Total installed capacity of Oran Park ZS is 90MVA with a firm (N-1) capacity of 45MVA.

Figure 6 shows the existing network in the South Creek West residential growth area, including the location of the existing Oran Park Zone Substation and Bringelly Zone Substation, and shows the 11kV feeder OP1112.

Figure 6 – Existing network in the South Creek West residential growth area

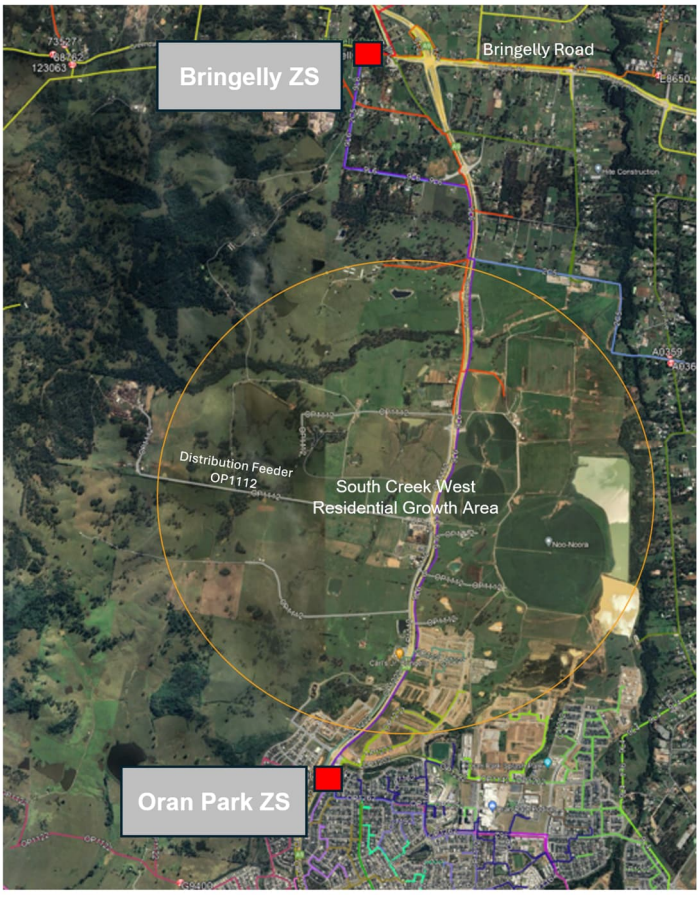
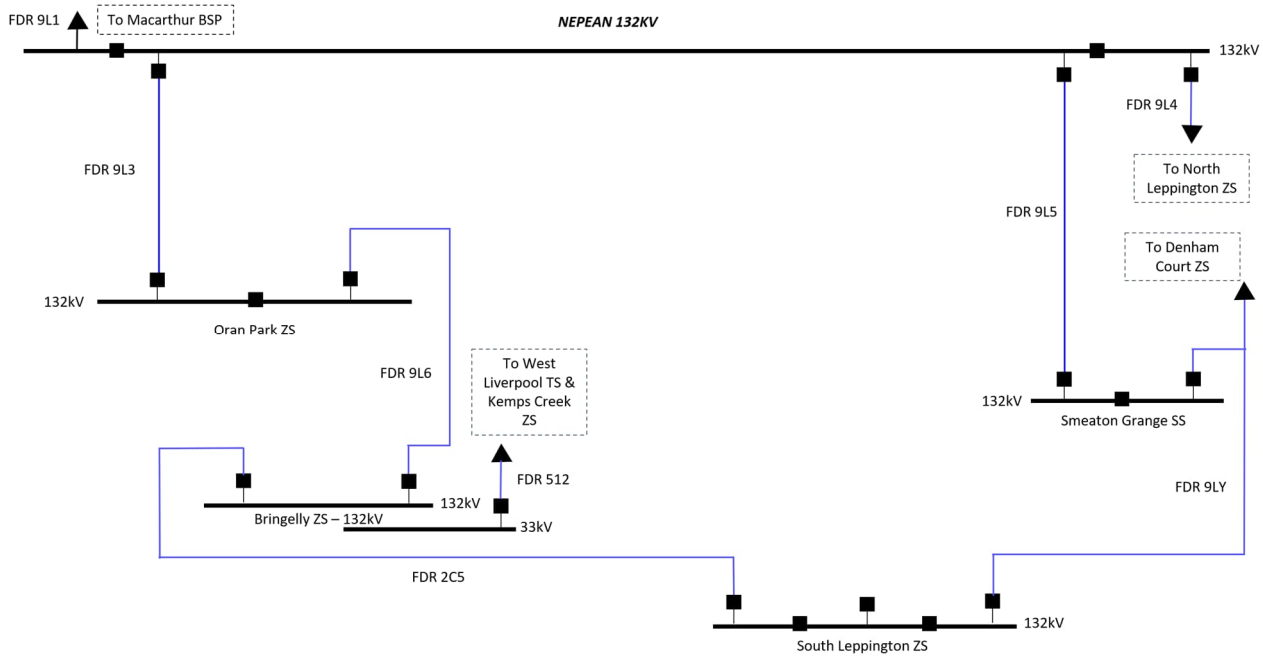


Figure 7 shows the 132kV supply to Oran Park ZS. 132kV feeders 9L6 and 9L3 provide supply to Oran Park ZS. Feeder 9L6 provides a 132kV connection between Oran Park ZS and Bringelly ZS. 9L6 follows The Northern Road and is approximately 6.0km route length.

Figure 7 – Single Line Diagram of the existing 132kV supply to Oran Park ZS



The existing network in the area is not capable of servicing the forecast growth in electricity demand. In particular, there are a number of network constraints that inhibit the ability to supply the forecast demand and customer connection requirements in the area. Table 4 shows the network constraints in the South Creek West residential growth area.

Table 4 – Network constraints in the South Creek West residential growth area

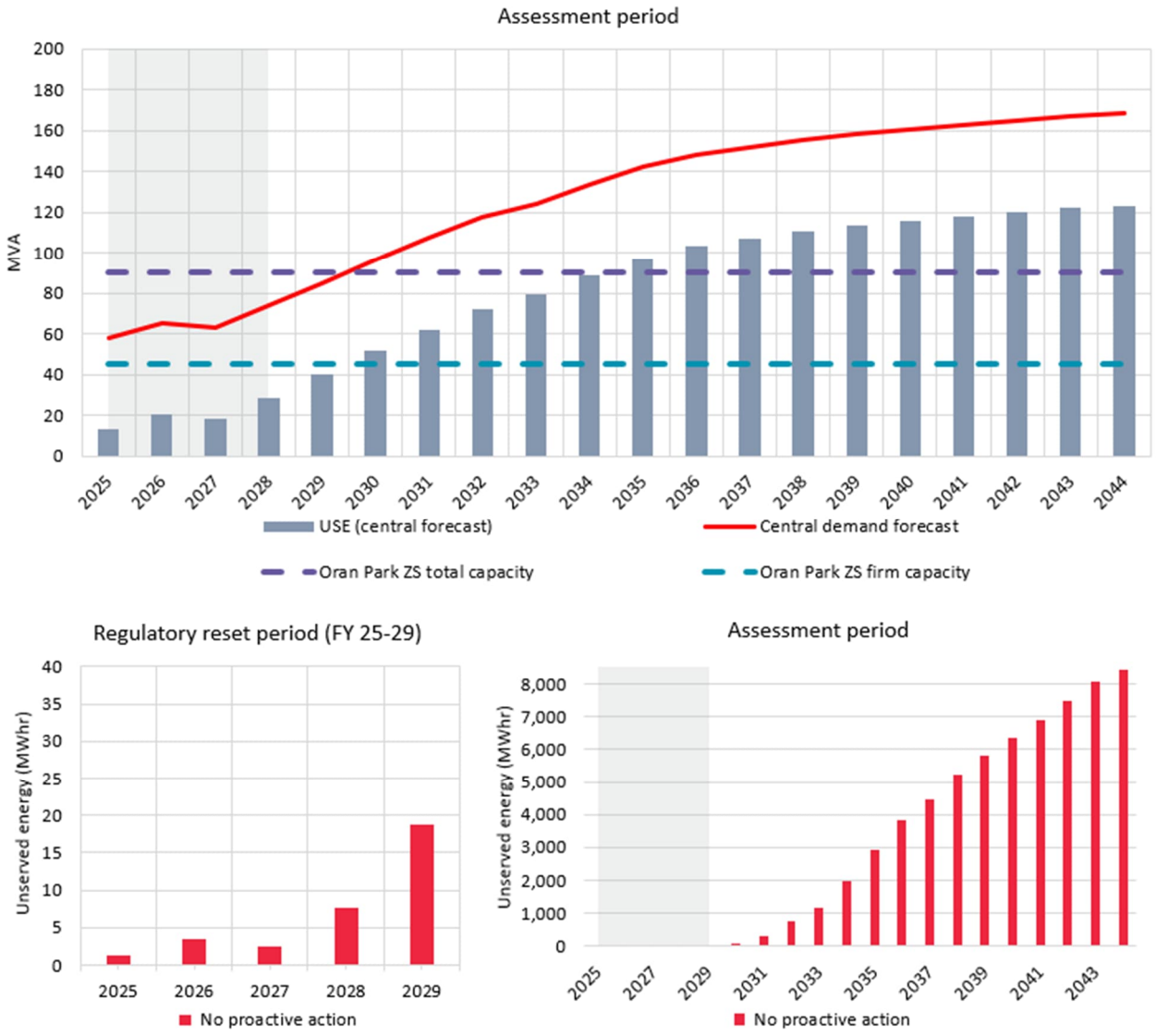
Network constraint	Description
Lack of firm capacity at Oran Park ZS	The Oran Park ZS has already exceeded its firm capacity in 2023/24. The demand forecast for Oran Park ZS for the summer 2024/25 is 53MVA which exceeds the firm capacity of 45MVA.
Lack of distribution network capacity from Oran Park ZS to the South Creek West residential growth area	There is currently only one 11kV feeder from Oran Park ZS that services the South Creek West residential growth area (OP1112). There are currently no available 11kV feeder circuit breakers at Oran Park ZS to support the establishment of new 11kV feeders to supply the South Creek West residential growth area.
No available capacity to supply from Bringelly ZS	There are no available 11kV feeder circuit breakers to provide additional feeders to supply the South Creek West residential growth area. Bringelly ZS will require augmentation in the future to support the growth in the Aerotropolis area including the planned new Bulk Supply Point in the Aerotropolis area and the potential augmentation to provide a 22kV supply to align to the Aerotropolis area. Although technically feasible, we also consider Bringelly ZS to be too far north of the initial centre of development of the South Creek West residential growth area to support a full-service plan from Bringelly ZS (3km north of the centre of the South Creek West residential growth area).

2.5 Expected unserved energy if action is not taken

If network augmentation is not undertaken, there will be a significant increase in expected unserved energy over the next two decades as demand in the South Creek West residential growth area increases. The expected unserved energy is calculated as the difference between the firm capacity at Oran Park ZS and the demand forecast for Oran Park ZS. The demand forecast of the South Creek West residential growth area is allocated to Oran Park ZS, such that Oran Park ZS is the constrained asset for the purpose of determining the expected unserved energy.

Figure 8 shows the expected unserved energy under the central demand forecast if 'no proactive intervention' is taken. Estimates are provided in both MVA and MWh. Notably, the available capacity in this area of our network has been exceeded since 2023/24 and is expected to continue to be exceeded into the future as more development occurs in the area.

Figure 8 – Unserved energy at the Oran Park ZS based on the central demand forecast scenario



Although we expect there to be significant market benefits associated with providing supply to the South Creek West residential growth area, we consider the need for this investment a 'reliability corrective action' due to our regulatory obligations to connect new customers.

2.6 Proposed scenarios for the forthcoming RIT-D NPV assessment

We have assessed three alternative future scenarios as part of the DPAR NPV assessment, namely:

- a central demand scenario – consisting of assumptions that reflect the central demand forecast in MVA terms. This scenario represents the best estimate of demand developed from DPE and local council plans, and customer enquiries;
- a high demand scenario – reflecting assumptions reflecting higher demand forecasts above the central demand scenario in MVA terms. This scenario has been included in the assessment to test the impact of a higher demand forecast on the ranking of the credible options; and
- a low demand scenario – reflecting factors that would lead to lower demand forecasts above the central demand scenario in MVA terms. This scenario has been included in the assessment to test the impact of a lower demand forecast on the ranking of the credible options.

Other parameters, including capital expenditure, VCR and discount rate will be held constant across the scenarios, with variations considered as part of the sensitivity analysis.

A summary of the key variables/framework expected to be used for each scenario is provided in Table 5 below.

Table 5 – Proposed scenarios for the forthcoming RIT-D NPV assessment

Parameter/ scenario	Central scenario	High demand	Low demand
Demand	Central demand forecast	High demand forecast (+10% MVA)	Low demand forecast (-10% MVA)
Capex	Central estimates	Central estimates	Central estimates
VCR	Load-weighted AER VCR of $30.69/kWh	Load-weighted AER VCR of $30.69/kWh	Load-weighted AER VCR of $30.69/kWh
Discount rate	3.27%	3.27%	3.27%
Scenario weighting	33%	33%	33%

Endeavour Energy considers that all scenarios are equally likely on the basis that there is no information that would indicate each individual scenario being more likely than other scenarios, and as such they have all been given equal weighting of one third for the assessment of credible options. We intend on using the 'weighted' outcome across the scenarios to determine the preferred option.

3. Proposed options to meet the identified need

We have determined four options to be credible in addressing the network need. These are:

- Option 1 – installation of a third transformer at Oran Park ZS in 2027 and establishment of Lowes Creek ZS (using an outdoor switchgear arrangement) with a single transformer in 2032;
- Option 2 - establishment of Lowes Creek ZS using an outdoor switchgear arrangement with two transformers in 2027;
- Option 3 – establishment of Lowes Creek ZS using an indoor switchgear arrangement with two transformers in 2027; and
- Option 4 – establishment of Lowes Creek ZS (using an outdoor switchgear arrangement) in stages with one transformer in 2027 and a second transformer added in 2032.

This section provides detailed information on the scope and cost of these options.

All four of the credible options involve establishing a new zone substation within the Lowes Creek Maryland precinct, which is strategically and beneficially located between Oran Park ZS and Bringelly ZS. The proposed location also takes advantage of the proximity to a 132kV supply that provides a low-cost connection of the proposed zone substation to the 132kV supply via feeder 9L6.

The credible options take different approaches that test the staging, use of adjacent zone substation and different technical configuration (including both outdoor and indoor) of the proposed new zone substation.

Figure 9 shows the location of the proposed Lowes Creek ZS. All four of the credible options considered include the establishment of Lowes Creek ZS. It will be located within the Lowes Creek Maryland precinct and approximately mid-way between the existing Oran Park ZS and Bringelly ZS. The location is approximately at the centre of the proposed development of the South Creek West residential growth area.

Figure 10 shows the proposed 132kV supply to the proposed Lowes Creek ZS which would include a connection to the existing 132kV feeder 9L6, which is economically efficient because of its proximity to the zone substation location.

Figure 9 – Location of the proposed Lowes Creek zone substation

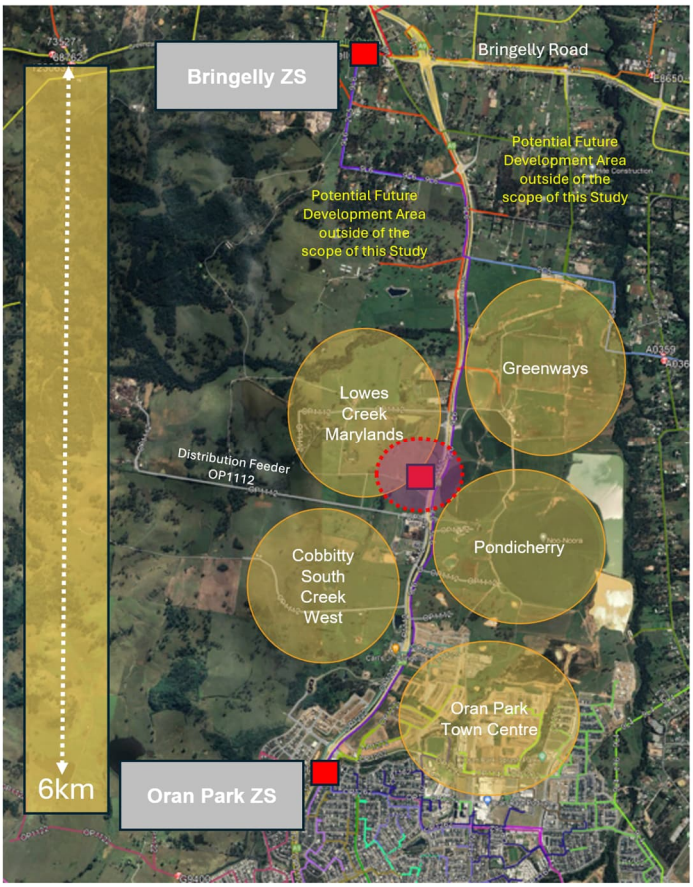


Figure 10 – Proposed 132kV supply to the Lowes Creek zone substation

3.1 Option 1 – Install a third transformer at Oran Park ZS in 2027 and establish Lowes Creek ZS using an outdoor switchgear arrangement with a single transformer in 2032

Option 1 involves two stages where:

- in Stage 1, a third 132/11kV 45MVA transformer is installed at the existing Oran Park ZS in 2026/27; and
- in Stage 2, a new 132/11kV Lowes Creek ZS using an outdoor switchgear arrangement with one 45MVA transformer is established in 2031/32.

Stage 1 results in the Oran Park zone substation having a firm capacity of 90MVA and a total installed capacity of 135MVA. It meets all requirements for medium term network capacity needs arising from the South Creek West residential growth area.

Supply to the Lowes Creek ZS established in Stage 2 would be established from a single tee-off connection from the existing 132kV feeder that runs between Oran Park ZS and Bringelly ZS.

Under Option 1, there would be a level of unserved energy risk as firm capacity does not meet estimated demand. However, this unserved energy risk arises from other precincts that Oran Park ZS serves that are outside of the scope of this RIT-D.[3] Endeavour Energy will eventually address this unserved energy risk with a separate investment (and associated RIT-D) at the appropriate point in time for that network need.

The total capital expenditure for this option is estimated to be $46.3 million in real 2023/24 dollars. Operating costs are assumed to be 0.4 per cent of total capital expenditure.

Capital works to augment the Oran Park ZS with a third transformer would commence in 2024/25, with commissioning in 2026/27. Construction of the Lowes Creek ZS would commence in 2026/27, with commissioning in 2031/32.

3.2 Option 2 – Establish Lowes Creek ZS using an outdoor switchgear arrangement with two transformers in 2027

Option 2 involves the establishment of Lowes Creek ZS 132/11kV using an outdoor switchgear arrangement, with two 45MVA transformers commissioned in 2027. 132kV supply to the Lowes Creek ZS would be established from a connection to the nearby 132kV feeder 9L6 that has a route from Oran Park ZS to Bringelly ZS.

The total capital expenditure for this option is estimated to be $34.4 million in real 2023/24 dollars. Operating costs are assumed to be 0.4 per cent of total capital expenditure.

The construction of the Lowes Creek ZS would commence in 2024/25 and commissioning would occur in 2026/27.

[3] In order to determine where to locate zone substations, Endeavour Energy drew theoretical geographical boundaries on load across precincts in the South West Residential Growth Area. This is why risk at one zone substation can be attributed to 'other' precincts connected to Oran Park ZS but not the precincts in this RIT-D.

3.3 Option 3 – Establish Lowes Creek ZS indoors with two transformers in 2027

Option 3 involves a new 132/11kV Lowes Creek ZS using an indoor switchgear arrangement, with two 45MVA transformers established in 2027. It is the same as Option 2, other than that switchgears for the zone substation (132kV and 11kV) would be housed indoors as opposed to outdoors.

Establishing the zone substation indoors would incur a higher level of capital costs due to the increased level of equipment, materials and labour required. It would also incur greater operating costs than Option 2, consistent with operating costs assumed to be 0.4 per cent of total capital expenditure.

Option 3 will reduce the level of expected unserved energy in an identical manner to Option 2. It will also provide an identical level of additional supply capacity and connection capability as Option 3. From a network augmentation and capability perspective, these options are identical in their supply aspects.

However, due to the specifications of indoor equipment required for Option 3, this option will emit more SF6 fugitive emissions than Option 2.

Endeavour Energy is considering this option upon developer feedback that an indoor arrangement would provide better visual amenity for the surrounding area. The developer is aware that the indoor arrangement imposes additional cost on the project and Endeavour Energy's customers. Accordingly, the developer has agreed to make an external contribution towards this option.[4] This reduces the effective cost of the option in the RIT-D assessment, in line with the AER RIT-D guidelines.[5]

The total capital expenditure for this option (before the external contribution) is estimated to be $39.5 million in real 2023/24 dollars, with operating costs assumed to be 0.4 per cent of total capital expenditure.

The construction of the Lowes Creek ZS would commence in 2024/25 with commissioning in 2026/27.

3.4 Option 4 – Establish a staged Lowes Creek ZS using an outdoor switchgear arrangement with one transformer in 2027 and a second transformer in 2032

Option 4 involves the Lowes Creek ZS using an outdoor switchgear arrangement being established over two stages, where:

- in Stage 1, Lowes Creek ZS with one 45MVA transformer is established with a connection from the existing 132kV feeder 9L6 in 2026/27; and
- in Stage 2, an additional 45MVA transformer, 132kV bus bar, 132kV transmission feeder bay and 11kV busbar is installed in 2031/32 to provide the substation with firm 45MVA capacity.

Stage 1 results in the zone substation having an installed capacity of 45MVA and following the commissioning of Stage 2, the installed capacity would be 90MVA.

The total capital expenditure for this option is estimated to be $42.3 million in real 2023/24 dollar terms, with operating costs assumed to be 0.4 per cent of total capital expenditure. This option is the highest cost option

[4] The value of the external contribution is considered commercially sensitive and therefore is treated as confidential. To meet reporting requirements under section 4.3 of the RIT-D guidelines we have disclosed the full cost of Option 3, before subtracting the external contribution, while net economic benefits for Option 3 are presented inclusive of the external contribution. To maintain confidentiality, we have redacted the PV of market benefits and costs, noting that we will provide these values to the AER upon request.

[5] AER, *RIT-D application guidelines*, October 2023, p 58-60.

out of the four credible options being considered. The higher costs reflect higher mobilisation and demobilisation costs required to stage the Lowes Creek ZS build out.

The construction of the Lowes Creek ZS would commence in 2024/25, with commissioning in 2026/27, and augmentation to the Lowes Creek ZS with a second transformer would commence in 2030/31, with commissioning in 2032/33.

4. Assessment of non-network solutions and SAPS

Following a review of the expected future load demands in the South Creek West residential growth area and the nature of the existing load and network capability, Endeavour Energy has determined that there is unlikely to be a non-network option, or SAPS option, that could form a potential credible option on a standalone basis, or that could form a significant part of a potential credible option for this RIT-D.

This section sets out the assessment behind this determination, which draws on the assumptions outlined in the sections above, and considers the required technical characteristics that a non-network option or SAPS option would need to meet the identified need.

4.1 Requirements that a non-network option would need to satisfy

We have considered the requirements that a non-network option would need to meet:

- to be able to form a credible stand-alone option; or
- to defer the network investment.

A viable non-network option that maintains supply to all customers must be capable of reducing the estimated shortfall on the network from the firm capacity at Oran Park zone substation. Under the central scenario, by the end of 2024/25 a shortfall is estimated to exist for 8 days in the year and is at a maximum of about 34 MWh per day in the summer period. By 2028/29, a shortfall is estimated to exist for 53 days in the year and at a maximum of about 206 MWh per day in the summer period under the central scenario. The requirement for support from non-network options is therefore substantive in both the number of days expected to be required and the magnitude of the support needed.

In addition, we note that for any non-network solution to be effective it would need to locate near, and essentially connect to, the new load connection points. We consider that any such co-location would be extremely difficult at the required capacity given the substantial land requirements for many non-network options, the planning approvals, issues with community acceptance and these being in addition to and in competition with the underlying developments expected in these areas. Further, the lack of existing load in the area negates the potential for demand reduction approaches.

Table 6 below summarises the expected network support requirements out to 2028/29 for any non-network solutions to form standalone options under the central scenario. We note that the requirements would increase further beyond 2028/29 as more customers connect to the South Creek West area network.

Table 6 – Network support required for a standalone option under the central scenario

Year	Peak load reduction required (MW)	Days required	Hours required	Total MWh required
FY25	13.0	8	26	34
FY26	20.5	16	53	72
FY27	26.0	21	69	77
FY28	28.8	28	87	124
FY29	39.9	53	169	206

Table 7 below sets out the requirements for non-network options to defer network expenditure in a cost effective manner, i.e., for them to be coupled with a network option in order to form a combined credible option.

Given that the comprehensive NPV assessment of the network options is yet to be undertaken (and will be part of the DPAR), the deferral assessment has been undertaken in this screening report using the preliminarily preferred network options involving establishment of Lowes Creek ZS with two transformers in 2027, i.e., Option 2 as the lowest cost option.

Table 7 – Network support required to defer a network option under the central scenario

Deferral period	Deferral year	Peak load reduction required (MW)	Days required	Hours required	Total MWh required	Deferral value[6]
1 year	FY26	20.5	16	53	72	$1.02 million
2 years	FY26	20.5	16	53	72	$2.01 million
	FY27	26.0	21	69	77	

The required characteristics for non-network solutions set out above demonstrates that the amount of demand reduction and/or local storage/generation that would be required to represent a credible option for this RIT-D is in an order of magnitude which does not appear realistic, given the existing load in the area. We therefore do not consider it technically feasible that non-network technologies can form standalone credible options that meet the entire identified need.

Similarly, the amount of load reduction that would be required in order to enable a deferral of network augmentation by one year is also unrealistically high, particularly when considering the low deferral value. We therefore also do not consider it commercially feasible that non-network technologies can be coupled with a network option to form a credible option.

4.2 Assessment of specific non-network technologies

In addition to our general assessment of whether non-network options are likely able to form a potential credible option on a standalone basis, or form a significant part of a potential credible option for the South Creek West residential growth area, we have considered individual non-network technologies. Our assessment is summarised in table 8.

Table 8 – Assessment of non-network technologies

Non-network technology	Assessment
Grid-scale storage	Not feasible because it would not defer network investment.
VPP	Not feasible because the precincts being addressed in the South Creek West residential growth area are new developments. Uptake initially requires customers to connect to the network, which is not feasible with the existing network infrastructure.
Residential BESS	Not feasible because it does not defer network investment. It also requires customers to connect to the network, which is not feasible with the existing network infrastructure.
Commercial direct load control	Not feasible because the precincts being addressed in the South Creek West residential growth area are new developments. Uptake initially requires customers to connect to the network, which is not feasible with the existing network infrastructure.
Behaviour demand response	Not feasible because the precincts being addressed in the South Creek West residential growth area are new developments. Uptake initially requires customers to connect to the network, which is not feasible with the existing network infrastructure.

Endeavour Energy acknowledges that non-network solutions may be able to assist in future as load continues to grow following the establishment of the initial network infrastructure for the South Creek West residential growth area.

[6] The deferral value is calculated as the net present value of deferring the preliminary preferred network option by one year using the central scenario's discount rate.

4.3 Consideration of SAPS options

Under the NER, RIT-D and RIT-D application guidelines, Endeavour Energy is required to consider whether a SAPS option can fully or partly address an identified need. In practice, this relates to consideration of whether an identified need could be fully or partly addressed by converting part of our distribution network forming part of the interconnected national electricity system to a regulated SAPS.[7] Regulated SAPS are set out in section 6B of the National Electricity Law (NEL), which defines a SAPS as a system that:[8]

- generates and distributes electricity; and
- does not form part of the interconnected national electricity system.

We consider that there is not a SAPS option that could form a potential credible option on a standalone basis, or that could form a significant part of the credible option, in this RIT-D. In particular, the load requirements of the greenfield development area are significant and therefore could not be supported by a network that is not part of the interconnected national electricity system with the ability to draw on grid-connected generation sources. In forming this conclusion, we have considered both the potential to convert part of our distribution network to a regulated SAPS as well as the potential to build a new SAPS (given the greenfield nature of the network development in this area).

We note that this conclusion does not preclude the development of embedded generation and storage by specific loads to meet part of their supply needs and/or as back-up to their grid connections. Such developments fall outside of the definition of a SAPS and are coupled with those loads continuing to also require their full demand to be able to be met from the grid.

[7] See definition of 'SAPS option' in the NER.

[8] Section 6B(6) of the NEL.

5. Conclusion

The South Creek West residential growth area is located within Sydney's south-west sector and is currently largely undeveloped and has been recently rezoned for residential housing. It is estimated to include 20,500 new residential dwellings and to require 172MVA of electricity supply capacity by 2050.

The available firm capacity in this area of our network has been exceeded since 2023/24 and expected future development will result in a large amount of load at risk and unserved energy in the area, e.g., 4.1MVA 2023/24 growing to over 100MVA by the late 2030s. Additionally, there is limited capacity within the existing 11kV distribution feeders.

Based on the extent of forecast demand for the South Creek West residential growth area, the expected cost of network options and the capacity of the existing network to facilitate non-network technologies, it is not considered feasible that a non-network solution will form a potential credible option on a standalone basis, or form a significant part of a potential credible option for this RIT-D. Further, SAPS options are unlikely to contribute to meeting the identified need because the size of greenfield development cannot be supported by a network that is not part of the interconnected national electricity system. Consequently, an Options Screening Report is not intended to be prepared for this RIT-D in accordance with clause 5.17.4(c) of the NER.

We consider that non-network solutions may be more likely to be feasible for future developments in the area as the cost of large scale battery storage continues to decrease, the widespread inclusion of solar PV in new commercial and industrial developments continues to increase, and the uptake of electric vehicles, including electric buses, offer opportunities for network support.

The load duration curve and peak load profile used in our analysis are based on our best estimate of the expected pattern of use in the area. However given the uptake of EVs, battery storage behind the meter and continued higher penetration of solar PV the load duration curve and the pattern of usage will change.

We estimate the rooftop solar penetration in the South Creek West area will exceed 30% of new residential dwellings having a solar PV system.

For example, we expect that the impact of EV charging cycles in both homes and workplaces will change the pattern of usage over time and will then impact the sizing of network infrastructure and potentially the capital investment required. Future changes to energy prices from retailers and network use of system charges are also likely to change the pattern of usage in the area over the long term.

These developments will be closely monitored as the South Creek West residential growth area develops over the next decade and non-network options will be considered as part of future network augmentations. In particular, Endeavour Energy will monitor these changes and assess whether an update to the evaluation in this RIT-D is needed should non-network options be a credible alternative to subsequent stages of network investment.

CONTACT

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