RIT-D Options Screening Notice

Providing increased supply capacity for the Riverstone East and Schofields Development Area

22 November 2024

Endeavour Energy

POWER together

1. Introduction

The Riverstone East and Schofields development area is located within the north-west of Sydney. It is approximately 25km north-west of Parramatta. The area is currently largely undeveloped and has been recently rezoned for residential housing and a limited area for enterprise business land use.

The Riverstone East and Schofields development area includes the multistage development at Riverstone East, the enterprise area at Riverstone West and residential growth areas at Schofields West and Alex Avenue.

These new residential areas will include their own town centres, schools, community facilities and future small scale commercial zoned spaces. The overall objective of the development area is to provide new residential housing in north-west Sydney and it has been a focus area for NSW government and local government. The area is also well served with public transport including the new Metro rail line and the dedicated bus lanes with stations and access points in close proximity to the development area.

The development area is planned to add approximately 20,000 new residential dwellings and to require 149MVA of electricity supply capacity by 2044. The existing infrastructure supporting these precincts, namely the Schofields ZS and Riverstone ZS and the existing 11kV network are not sufficient to provide the supply necessary to support the future development of the area.

We are commencing this RIT-D to determine the most efficient means of providing supply to the Riverstone East and Schofields development area. Although we expect there to be significant market benefits associated with providing supply to the Riverstone East and Schofields development 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 a RIT-D to investigate, and consult on, how to most efficiently provide supply to future load developments in the Riverstone East and Schofields Development 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 is likely to occur from late 2024/25, and based on the connection enquiries received to date, load 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 Riverstone East and Schofields development 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 Riverstone East and Schofields development 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

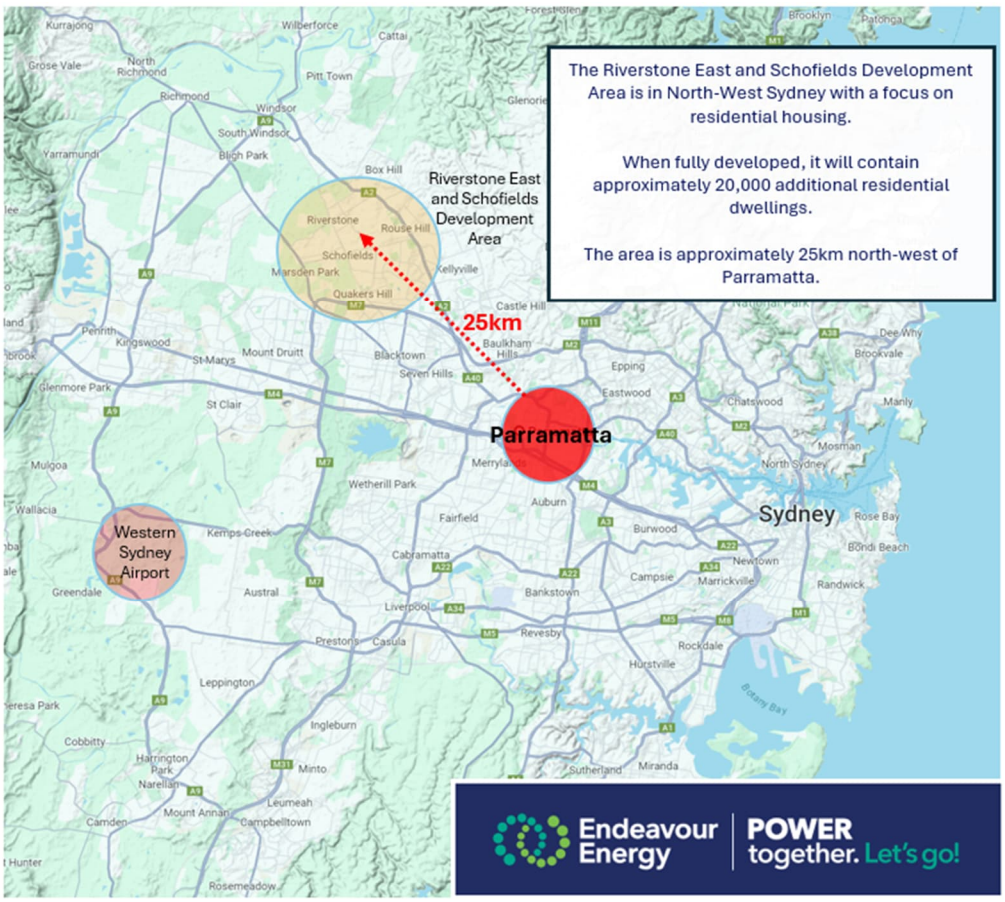
This section sets out the key assumptions and methodologies that underpin the identified need for this RIT-D. These assumptions have been used in making our determination that there will not be a potential credible non-network option, or SAPS option, on a standalone basis, or that forms a significant 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 Riverstone East and Schofields development area is located approximately 25km north-west of Parramatta.

Figure 1 below shows the location of the Riverstone East and Schofields development area in relation to Parramatta.

Figure 1 – Location of the Riverstone East and Schofields Development Area in Western Sydney



The development area has been identified by the NSW Department of Planning and Environment (DPE) as an area of substantial growth.

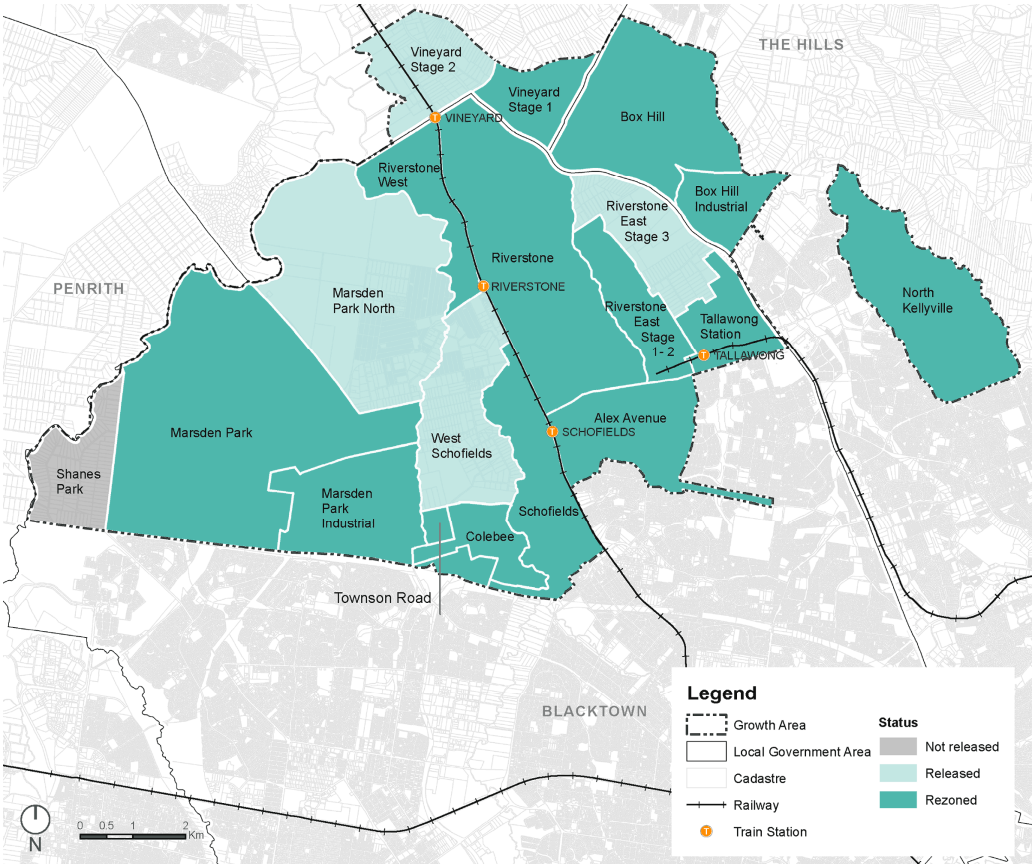
DPE's Land Use and Infrastructure Implementation Plan states that the North West Priority Growth Area is forecast to contribute approximately 12% of the homes needed to meet demand in Sydney over the next 20 years.[1]

Residential development plans in the area have been further underpinned by the introduction of Sydney Metro's Northwest line connecting Tallawong Station (located within the Schofields area) with key employment areas across West Sydney, North Sydney and the Sydney Central Business District (CBD).

Together with existing Sydney Rail connections, Sydney Metro and Sydney Rail transport links have made the area an attractive location for residential development.

Figure 2 below shows the NSW Department of Planning's layout for the North West Sydney area and shows the precincts, LGA boundaries, zoning and rail network. The Riverstone East and Schofields development area is a subset of the NSW Government's North West Sydney area plan and we have further defined this geographic area for this study.

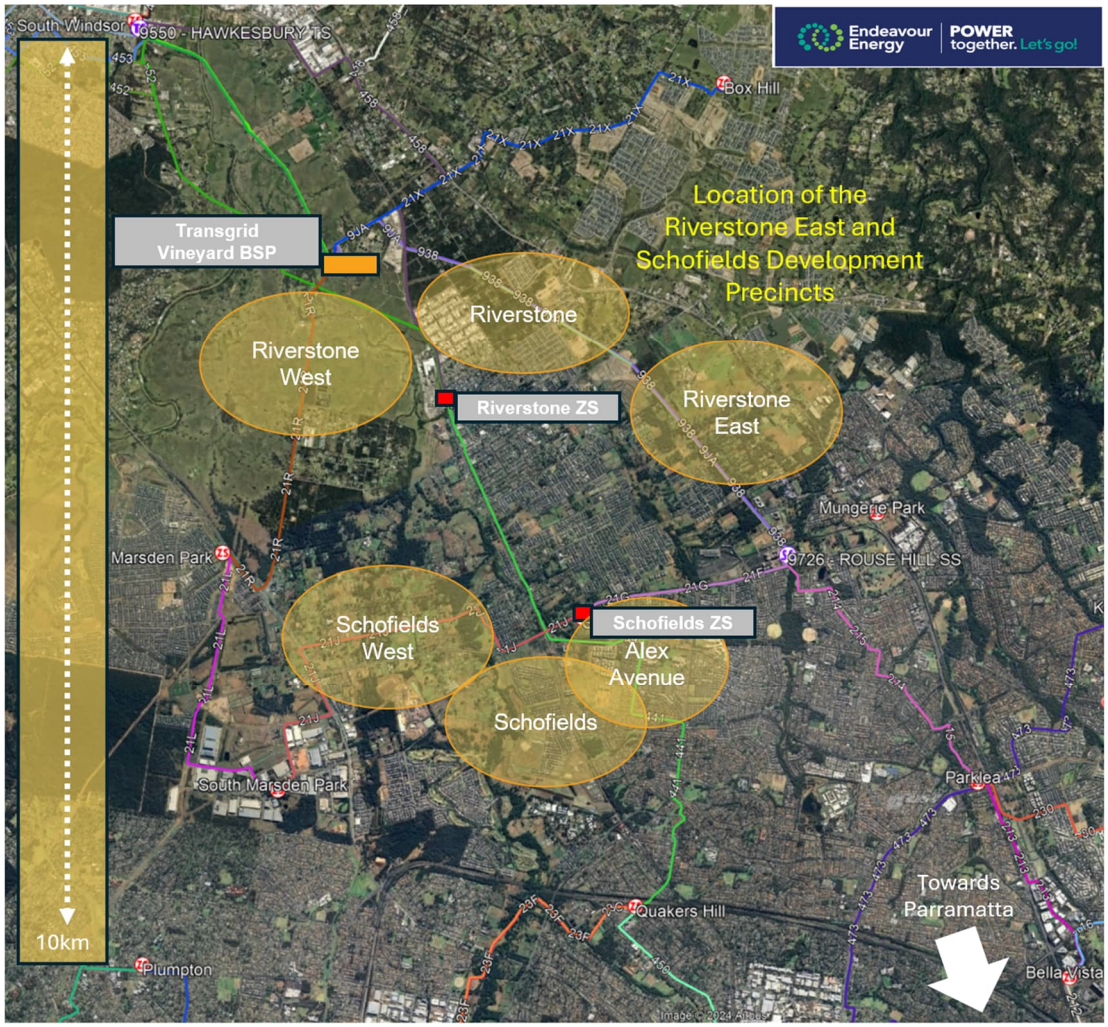
Figure 2 – NSW Department of Planning's layout for the North West Sydney area



[1] NSW DPE, *North West Priority Growth Area Land Use and Infrastructure Implementation Plan*, May 2017, p 8.

Figure 3 shows the Riverstone East and Schofields development area and the precincts that have been used in making the demand forecast to define the identified need and the electricity supply requirements for the development area. The precinct names are based on information available to Endeavour Energy during the time of our planning process and may not be the final place-names for these areas. The final place-names may be determined by the sales & marketing operations of property developers in conjunction with the local government authority (LGA).

Figure 3 – Riverstone East and Schofields development area and the precincts proposed for new residential housing



2.2 Load characteristics and demand forecast

The Riverstone East and Schofields development area will comprise land zoned primarily for residential use and will also include community facilities such as schools, sporting facilities and town centres with shopping and commercial use. There will also be some land area allocated and zoned for enterprise use.

Based on the proposed precincts, the development area will include approximately 20,000 new residential dwellings by 2044 and will require 149MVA of electricity supply capacity by 2043/44.

Table 1 below shows the proposed Riverstone East and Schofields development area precincts and the corresponding new housing lots estimated to be completed by 2044. 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.

Table 1 – Riverstone East and Schofields Development Area precinct development summary

Proposed Precinct	Estimate of total additional residential housing lots by 2044	Details
Riverstone East	3,600 to 8,700	In addition to the residential housing lots, there are planned community facilities including town centre, schools and sporting facilities. There is a potential increase in housing density which may provide a higher number of residential lots.
Riverstone	2,800	Residential dwellings expected to commence from 2024 onwards. Including community facilities, town centre and shopping centre.
Riverstone West	-	88 hectares of employment land for light industrial enterprise development expected. No residential lots planned.
Schofields	1,250	Residential dwellings expected to commence from 2024 onwards.
Schofields West	2,050	In addition to the residential housing lots, there are planned community facilities.
Alex Avenue	2,400	Residential dwellings expected to commence from 2024 onwards including a town centre and shopping area.

Table 2 shows the assumptions that have been used to develop the demand forecast from the underlying residential growth plans for the area. For the employment lands within the development area, we use the values provided by the proponents of network connection applications as the basis for our aggregated demand forecast including our assumptions of the timing and rate of development of the area.

Table 2 – Riverstone and Schofields development 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 (peak annual demand) for the area based on the development plans and the assumptions set out in Table 2.

Table 3 - Demand forecast for the Riverstone East and Schofields Development Area

Demand Forecast (MVA)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037	2042
Riverstone ZS	23.7	25.4	28.5	31.1	33.7	34.3	35.0	35.8	36.7	39.1	41.1
Schofields ZS	39.9	50.0	59.5	67.1	73.9	82.9	86.6	90.3	93.9	100.2	105.3
Total Demand	63.6	75.4	88.0	98.2	107.6	117.2	121.6	126.1	130.6	139.3	146.4
Demand Forecast (MVA)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037	2042
High Forecast	70.0	82.9	96.8	108.0	118.4	128.9	133.8	138.7	143.7	153.3	161.1
Central Forecast	63.6	75.4	88.0	98.2	107.6	117.2	121.6	126.1	130.6	139.3	146.4
Low Forecast	57.2	67.9	79.2	88.4	96.8	105.5	109.4	113.5	117.5	125.4	131.8

Based on the central demand forecast set out above, 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. We believe that the +/- 10% variation for the High and Low scenarios is reasonable, although they are relatively small variations, this area has well advanced development plans for other related infrastructure including roads and public transport and sales & marketing activity from property developers. We have a high level of confidence in the demand forecasts used in this study and have been monitoring this area for a number of years in gathering data and information to inform our forecasts.

2.3 Expected pattern of use

Due to the similarities in the expected residential housing development proposed in the Riverstone East and Schofields development area and the adjacent Schofields ZS and Riverstone ZS supply area, we have used the pattern of use from both of the Schofields and Riverstone Zone Substations.

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 Schofields ZS which has 40% of residential homes with a rooftop solar installation. The average size of rooftop solar system in the adjacent Schofields ZS service area is 6.8kW. We expect similar sizing and penetration in the residential areas of the new development area.

Specifically, the demand profile for the Schofields precincts (which includes the Schofields, West Schofields and Alex Avenue precincts) are based on the Schofields ZS load profile.

The demand profile for the Riverstone precincts (which includes the Riverstone East, Riverstone, and Riverstone West precincts) are based on the existing Riverstone ZS.

The existing supply capacity currently servicing the Riverstone East and Schofields Development Area has been included in our assessment of the identified need.

Figure 4 and Figure 5 below show the load duration curves (LDCs) for the existing Schofields and Riverstone Zone Substations. Both of the zone substations exhibit reverse power flow over the course of the year with Schofields ZS having a reverse power flow for approximately 20% of the year (based on the analysis of all of the half hour periods in the year 2023/24).

Figure 6 and Figure 7 show the peak load profiles for a summer day for both the existing Schofields and Riverstone Zone Substations.

Figure 4 – Schofields ZS Load Duration Curve (based on 2023/24)

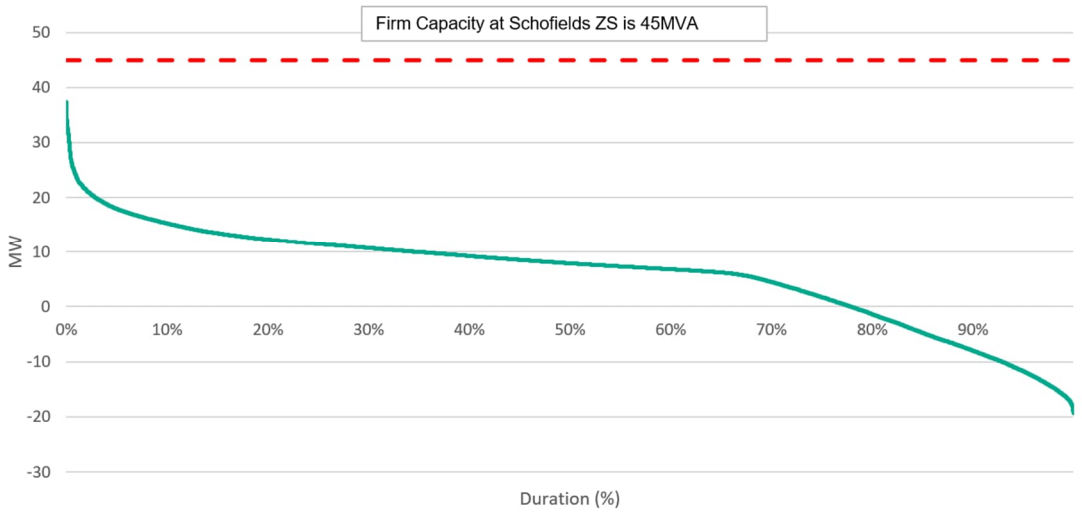
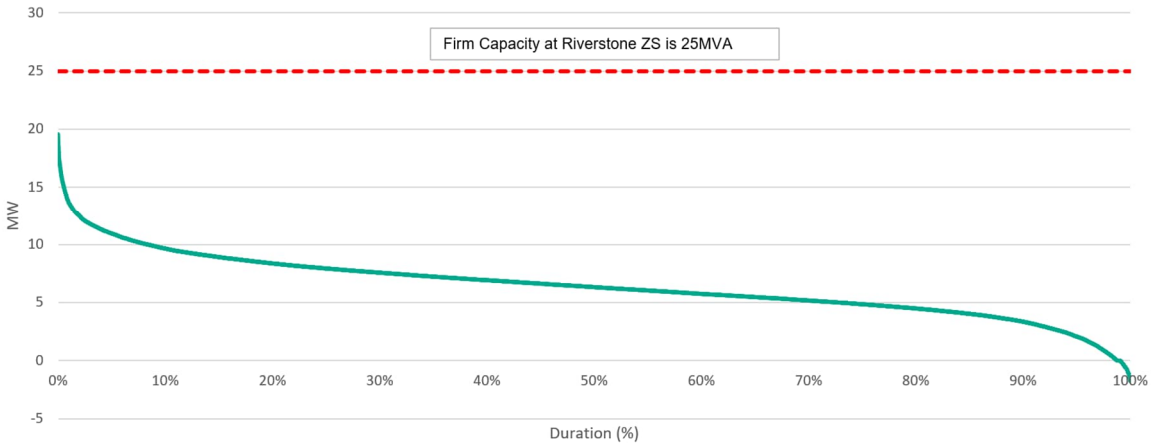


Figure 5 – Riverstone ZS Load Duration Curve (based on 2023/24)



The peak summer day profiles for Schofields ZS and Riverstone ZS show that peak demand is at approximately 6.30pm to 8.00pm due to air conditioning demand in the evening of a hot summer day. By 6pm on a summer evening, the rooftop solar output begins to rapidly decrease as the elevation of the sun falls below the set point angle to the roof that many rooftop solar installations utilise. The majority of rooftop solar installations are set at an angle to maximise energy yield over the course of a year which does not fully capture the summer evening sun particularly after 6pm when the sun will set at 7.30pm to 8.00pm in the summer.

Figure 6 – Peak summer day profile for Schofields ZS

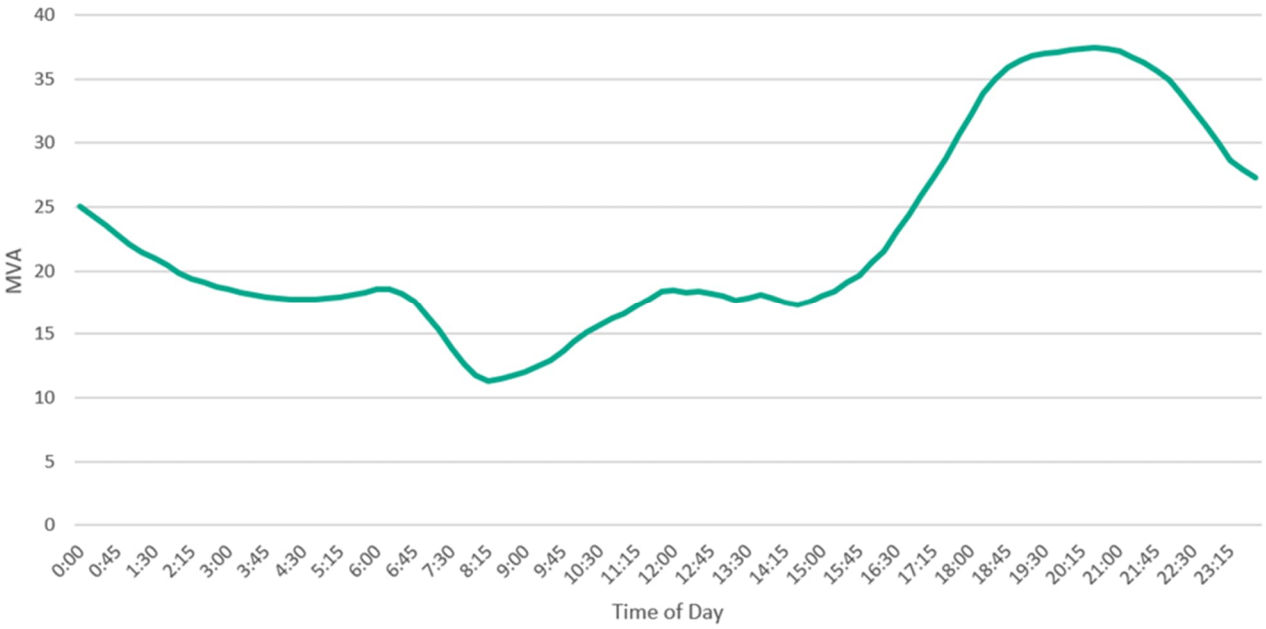
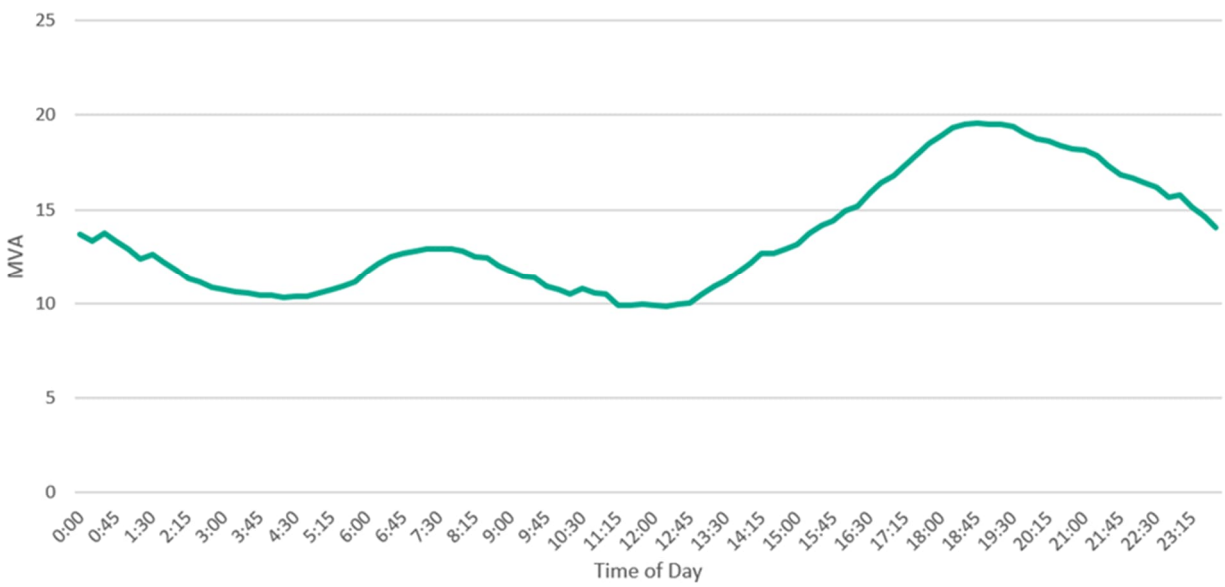


Figure 7 – Peak summer day profile for Riverstone ZS



2.4 Existing network

The Riverstone East and Schofields development area is currently serviced by the 11kV feeders from the existing Riverstone ZS and Schofields ZS. The two existing zone substations are approximately 4km apart and are well positioned and located in geographic terms to supply the area, however they are both capacity constrained and are approaching their firm supply capacity.

Table 4 below provides a summary of the existing zone substations that serve the development area.

Table 4 – Summary of the existing zone substations in the development area

Existing Zone Substation	Summary details
Riverstone ZS	2 x 25MVA 33/11kV transformers. 50MVA Total Capacity. 25MVA Firm Capacity (N-1, assuming the loss of one transformer).
Schofields ZS	2 x 45MVA 132/11kV transformers. 90MVA Total Capacity. 45MVA Firm Capacity (N-1, assuming the loss of one transformer).
Total existing zone substation capacity	140MVA Total installed zone substation transformer capacity. 70MVA Total zone substation firm capacity.

Figure 8 below shows an aerial view of the Riverstone East and Schofields development area including the Riverstone ZS and Schofields ZS. Transgrid's Vineyard Bulk Supply Point is to the north and two of the major 132kV feeders 9JA and 938 (to the east of Riverstone ZS) are shown.

Figure 8 – Aerial view of the existing network in the Riverstone East and Schofields development area

Figure 9 below shows a simplified single line diagram for the existing Schofields ZS. Schofields ZS has three points of 132kV supply, utilising three sections of the 132kV busbar and available space for a third power transformer.

Figure 9 – Schofields ZS - Single Line Diagram

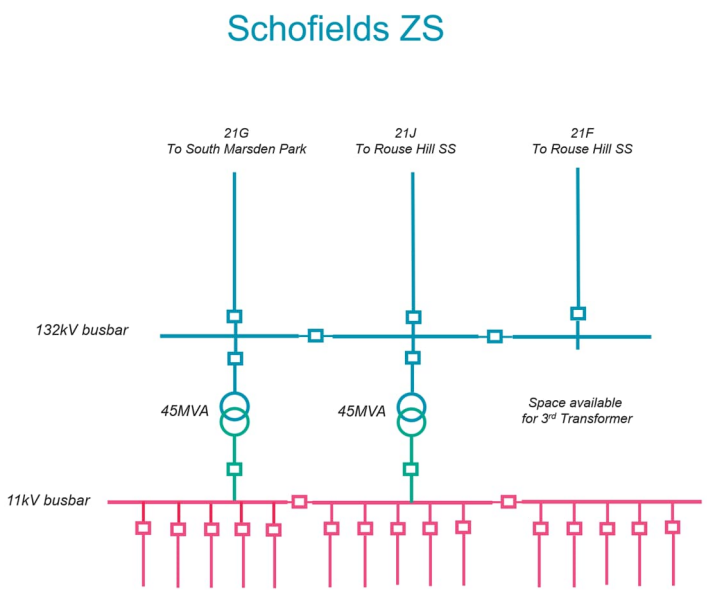
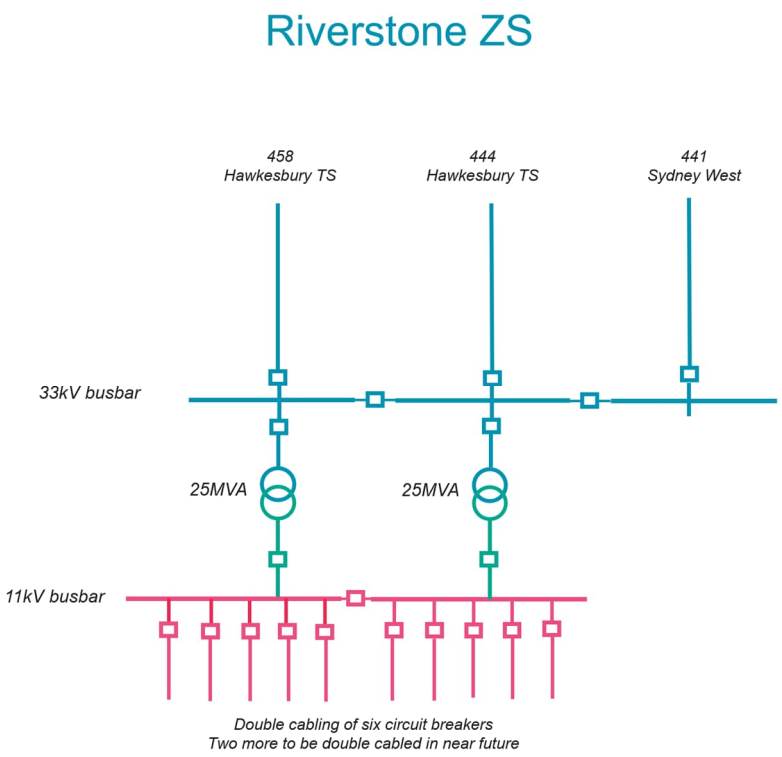


Figure 10 below shows a simplified single line diagram for the existing Riverstone ZS, which has three points of 33kV supply, utilising three sections of the 33kV busbar. The current Riverstone ZS 11kV distribution feeder arrangement is at capacity and will be constrained without further augmentation.

Figure 10 – Riverstone ZS - Single Line Diagram



Both zone substations serve areas with high levels of rooftop solar penetration which results in reverse power flows when solar generation exceeds the demand in the area. In particular, Schofields ZS is now exhibiting reverse power flow for 20% of the year and has the highest level of rooftop solar penetration in the north west area of Sydney. Table 5 shows the existing customer numbers and the solar installations in the Riverstone East and Schofields Development Area that are supplied from the existing zone substations.

Table 5 – Customer Numbers and Solar Installations in the Riverstone East and Schofields development area

Zone Substation	Customers	Solar PV installations	Solar Penetration (%)	Installed Customer Solar Capacity (MW)	Average Customer Solar Sizing (kW)
Riverstone ZS	5,822	1,478	25%	9.8	6.6
Schofields ZS	11,075	4,445	40%	30.3	6.8

Despite the high levels of penetration, rooftop solar generation does not materially mitigate peak demand which occurs between 6.30pm to 8.00pm in the summer when air conditioning use during that time period is high. With further development in the Riverstone East and Schofields development area, network constraints will become a more significant risk even with a high level of rooftop solar generation. We expect similar uptake of rooftop solar in the development area based on similar housing design and expected customer behaviour. Although Riverstone ZS is more established and has an older housing stock, it has a relatively high level of solar penetration at 25%, however we expect the new residential areas to be at 40% rooftop solar penetration.

Table 6 sets out these network constraints in the Riverstone East and Schofields development area.

Table 6 – Network constraints in the Riverstone East and Schofields development area

Network Constraint	Description
Lack of firm capacity at Riverstone ZS	The demand forecast for Riverstone ZS for the summer 2024/25 is 25.4MVA which exceeds the firm capacity of 25MVA. If one of the two power transformers at Riverstone ZS were to fail, then the remaining in-service transformer would be unable to supply the maximum demand forecast over summer 2024/25.
Lack of additional distribution feeder availability at Riverstone ZS	Riverstone ZS has 10 x 11kV feeder circuit breakers with six of these double cabled and it is planned that two more circuit breakers will be double cabled in the next two years. There are no freely available feeder circuit breakers to provide for additional distribution feeders at Riverstone ZS.
Lack of firm capacity at Schofields ZS	The demand forecast for Schofields ZS for the summer 2024/25 is 50.0MVA which exceeds the firm capacity of 45.0MVA. If one of the two power transformers at Schofields ZS were to fail, then the remaining in-service transformer would be unable to supply the maximum demand forecast over summer 2024/25.

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 Riverstone East and Schofields development area increases.

The expected unserved energy is determined from the difference between the combined firm capacity at Schofields ZS and Riverstone ZS and the demand forecast for Riverstone East and Schofields development area.

We have used the combined capacity at the two existing zone substations to determine the load at risk and the expected unserved energy.

Based on the demand forecast there will be load at risk from late 2024/25 due to the central demand forecast exceeding the firm capacity of the network.

Table 7 below shows the demand forecasts for the Riverstone East and Schofields development area with the demand in the new precincts allocated to the existing Schofields ZS and Riverstone ZS and then using the combined capacity of the existing network to determine the Load at Risk.

Table 7 – Demand forecasts and existing capacity in the Riverstone East and Schofields development area (financial years)

Demand Forecast (MVA)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037	2042
Riverstone ZS	23.7	25.4	28.5	31.1	33.7	34.3	35.0	35.8	36.7	39.1	41.1
Schofields ZS	39.9	50.0	59.5	67.1	73.9	82.9	86.6	90.3	93.9	100.2	105.3
Total Demand	63.6	75.4	88.0	98.2	107.6	117.2	121.6	126.1	130.6	139.3	146.4
Demand Forecast (MVA)	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2037**	**2042**
High Forecast	70.0	82.9	96.8	108.0	118.4	128.9	133.8	138.7	143.7	153.3	161.1
Central Forecast	63.6	75.4	88.0	98.2	107.6	117.2	121.6	126.1	130.6	139.3	146.4
Low Forecast	57.2	67.9	79.2	88.4	96.8	105.5	109.4	113.5	117.5	125.4	131.8
Capacity (MVA)	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2037**	**2042**
Total capacity	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
Firm capacity	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Load at risk	0	5.4	18.0	28.2	37.6	47.2	51.5	56.1	60.6	69.3	76.4

Figure 11 below shows load at risk for the Riverstone East and Schofields development area using the demand forecast scenarios and the capacity of the existing zone substations.

Figure 11 – Load at risk due to insufficient capacity at Riverstone East and Schofields Development Area

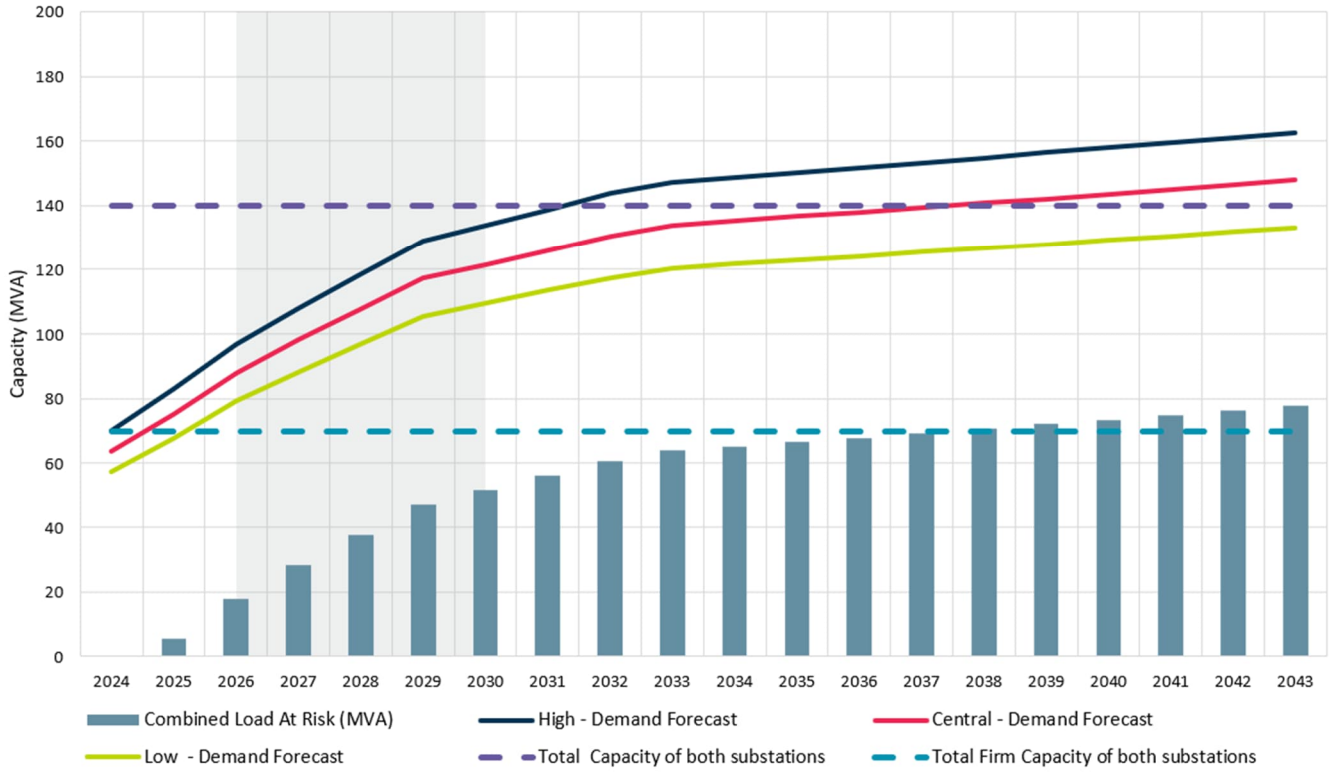
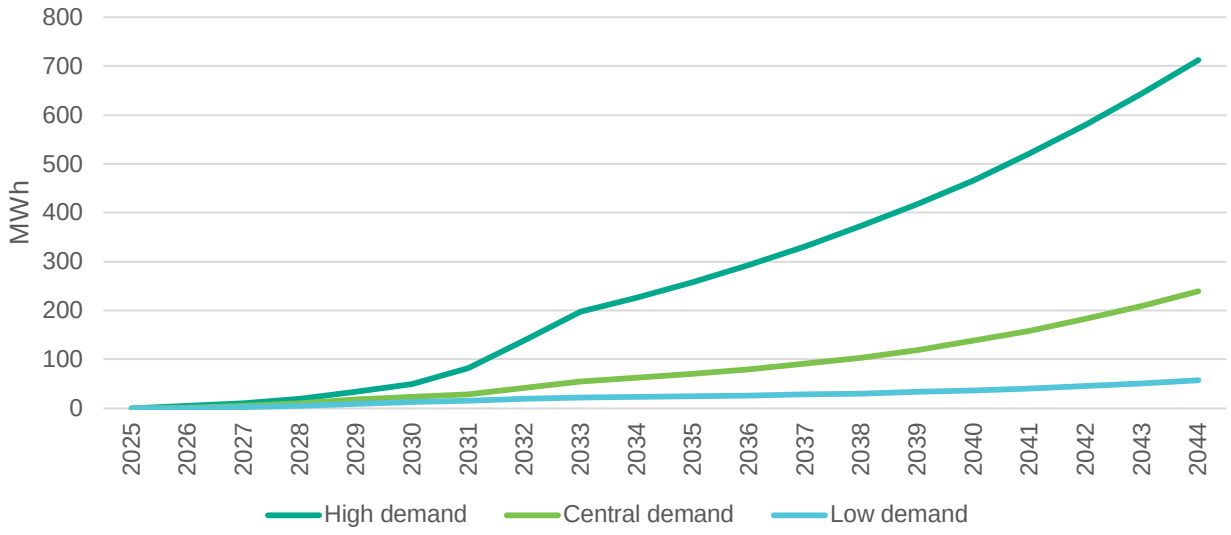


Figure 12 below shows the expected unserved energy for the Riverstone East and Schofields development area based on the three (3) demand forecast scenarios.

Figure 12 – Expected Unserved Energy for the Riverstone East and Schofields development area



2.6 Proposed scenarios for the forthcoming RIT-D NPV assessment

RIT-D assessments are required to be based on a cost-benefit analysis that includes an assessment of 'reasonable scenarios', which are designed to test alternate sets of key assumptions and whether they affect the identification of the preferred option.

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 council plans, and customer enquiries;
- a high demand scenario – reflecting a 10 per cent increase in total demand, in MVA terms, relative to the central scenario. 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 10 per cent lower total demand, in MVA terms, relative to the central scenario. 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 are held constant across the scenarios, with variations considered as part of the sensitivity analysis.

A summary of the key variables/framework used for each scenario is provided in table 8 below.

Table 8 – Scenarios used in 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 $37,976/MWh	Load-weighted AER VCR $37,976/MWh	Load-weighted AER VCR $37,976/MWh
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.

3. Proposed options to meet the identified need

Two options were determined to be credible in addressing the customer need and have been assessed in comparison to the base case. The options are:

- Option 1 – Establish a new Grantham Farm ZS in 2026/27 and augment Schofields ZS in 2031/32; and
- Option 2 – Augment Schofields ZS in 2026/27 and establish a new Grantham Farm ZS in 2031/32.

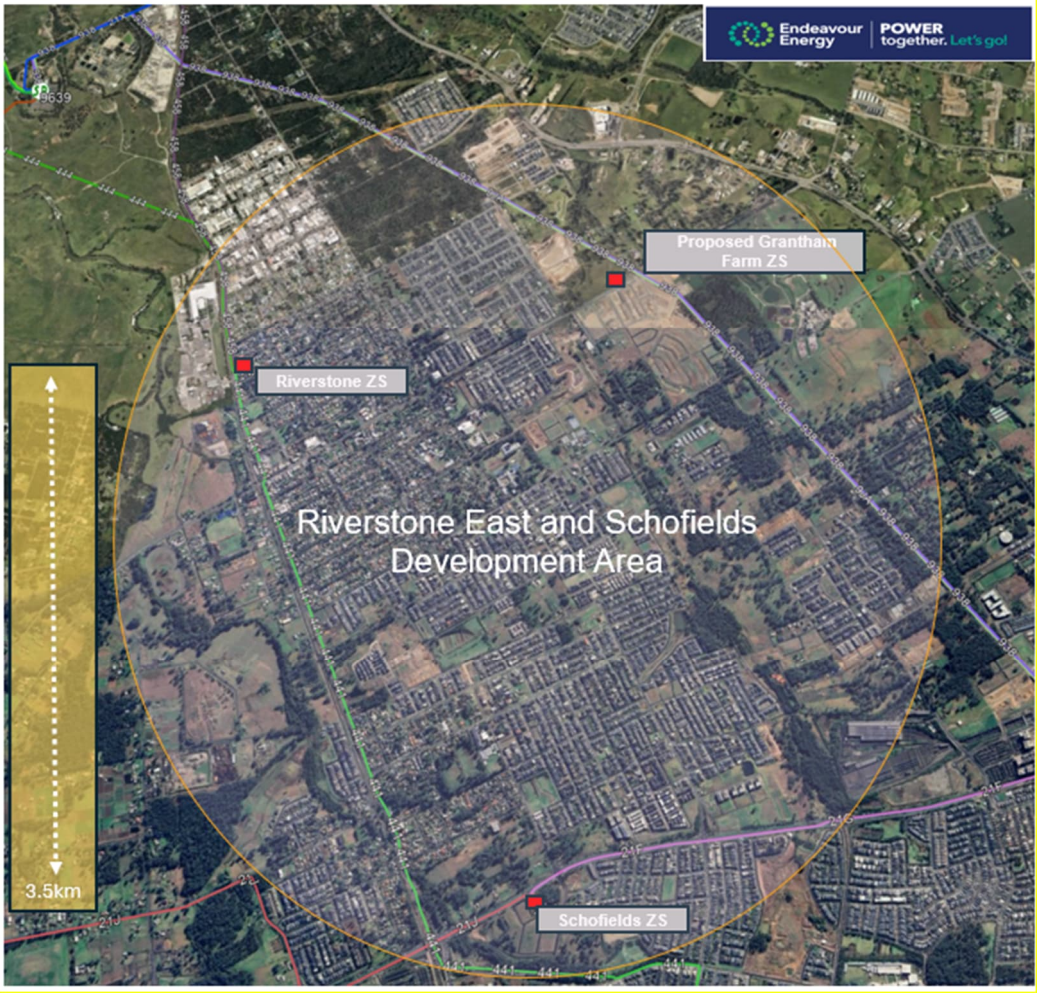
This section provides detailed information on the scope and cost of these options. It also discusses options that were considered but were not progressed further.

Both credible options involve two stages that reflect common substation works in order to continue servicing existing load and the developments set out in the demand forecast. The common substation works under both credible options are:

- augment the existing Schofields ZS to increase total firm capacity by 45 MVA; and
- establish a new Grantham Farm ZS to increase total firm capacity by 45 MVA.

Figure 13 below shows the location of the Riverstone East and Schofields Development Area in relation to existing zone substations at Riverstone and Schofields. The proposed location of the Grantham Farm ZS is shown. The proposed establishment of the Grantham Farm ZS is a key part of both of the options considered to increase the supply capacity to the development area.

Figure 13 – Riverstone East and Schofields development area in relation to existing and proposed network assets



3.1 Option 1 – Establish a new Grantham Farm ZS in 2026/27 and augment Schofields ZS in 2031/32

Option 1 provides increased supply capacity to the Riverstone East and Schofields Development Area in two stages:

- Stage 1 – establish a new 132/11kV Grantham Farm ZS with 45MVA firm capacity, commissioned in 2026/27; and
- Stage 2 – establish a third 132/11 kV 45MVA transformer at Schofields ZS, commissioned in 2031/32.

Table 9 below shows the scope of works and the costs for Option 1 including the proposed staging of the works.

Table 9 – Scope of works and costs for Option 1

Stage (commissioning)	Scope	Description	Cost estimate ($M, 2023/24)
Stage 1 (2026/27)	Substation works	Purchase Land for site for Grantham Farm ZS.	6.7
		Establishment of Grantham Farm ZS including: • Two 45MVA 132/11 kV transformers and provision space for three transformers • Two 132kV bus sections and provision of space for a third bus section and a third feeder bay • Two 11kV sections of busbar with 5 x 11kV CBs per section • Outdoor switchgear arrangement	34.4
	Transmission works	• Establish a 132kV supply by connecting to the existing 132kV overhead feeder 9JA.	1.0
	Distribution works	• Establish an auxiliary supply to the new ZS and provide four (4) x 11kV feeders to provide cross zone feeder ties and initial supply to the development area.	4.1
Stage 2 (2031/32)	Substation works	Augmentation of Schofields ZS including: • One 45MVA 132/11kV transformer including bund and blast walls. • Connection of secondary systems for control and data acquisition from the new transformer.	7.6
Total		**Staged establishment of Grantham Farm ZS and the Augmentation of Schofields ZS with a third transformer**	**53.8**

The total estimated capital cost for Option 1 is $53.8 million in real 2024 dollar terms. The annual operating costs are estimated to be 0.4 per cent of total capital expenditure (excluding land costs).

The purchase of land for the establishment of a proposed Grantham Farm ZS was completed in 2022 and the associated purchase cost has been included at its estimated current market value.

3.2 Option 2 – Augment Schofields ZS in 2026/27 and establish a new Grantham Farm ZS in 2031/32

Option 2 provides increased supply capacity to the Riverstone East and Schofields development area in two stages:

- Stage 1 – establish a third 132/11kV 45MVA transformer at Schofields ZS, commissioned in FY 2026/27; and
- Stage 2 – establish a new 132/11kV Grantham Farm ZS with 45MVA firm capacity, commissioned in FY 2031/32.

Table 10 below shows the scope of works and the costs for Option 2 including the proposed staging of the works.

Table 10 – Scope of works and costs for Option 2

Stage (commissioning)	Scope	Description	Cost estimate ($M, 2023/24)
Stage 1 (2026/27)	Substation works	Augmentation of Schofields ZS including: • One 45MVA 132/11kV transformer including bund and blast walls. • Connection of secondary systems for control and data acquisition from the new transformer.	7.6
	Distribution works	Establishment of eight (8) additional 11kV feeders from Schofields ZS into the new development precincts.	4.4
Stage 2 (2031/32)	Establish Grantham Farm ZS	Purchase Land for site for Grantham Farm ZS.	6.7
		Establishment of Grantham Farm ZS including: • Two 45MVA 132/11 kV transformers and provision space for three transformers • Two 132kV bus sections and provision of space for a third bus section and a third feeder bay • Two 11kV sections of busbar with 5 x 11kV CBs per section • Outdoor switchgear arrangement	34.4
	Transmission works	• Establish a 132kV supply by connecting to the existing 132kV overhead feeder 9JA.	1.0
Total		**Staged installation of a third transformer at Schofields ZS and establishment of Grantham Farm ZS**	**54.1**

The total estimated capital cost for Option 2 is $54.1 million in real 2024 dollar terms. The annual operating costs are estimated to be 0.4 per cent of total capital expenditure (excluding land costs).

The purchase of land for the establishment of a proposed Grantham Farm ZS was completed in 2022 and the associated purchase cost has been included at its estimated current market value.

4. Assessment of non-network solutions and SAPS

Following a review of the expected future customer demand in the Riverstone East and Schofields development area and the nature of the existing customer demand 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 of the combined Riverstone and Schofields zone substations. Under the central scenario, by the end of 2024/25 a shortfall is estimated to exist for 1 day in the year and is at a maximum of about 4 MWh per day in the summer period. By 2028/29, a shortfall is estimated to exist for 46 days in the year and at a maximum of about 222 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 11 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 Riverstone East and Schofields development area. Our preliminary preferred network option would likely be commissioned in mid 2027 and therefore the FY25 and FY26 values are indicative of the load at risk and the energy at risk that is expected to exist prior to the commissioning of our network option.

Table 11 – 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	5.4	1	2	4
FY26	18.0	12	28	174
FY27	28.2	19	45	469
FY28	37.6	30	77	907
FY29	47.2	46	130	1609

Table 12 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 Grantham Farm ZS with two transformers in 2027.

Table 12 – Network support required to defer a network option under the central scenario

Deferral period	Deferral year	Peak demand reduction required (MW)	Days required	Hours required	Total MWh required	Deferral value[2]
1 year	FY27	28.2	19	45	469	$1.51 million
2 years	FY27	28.2	19	45	469	$3.02 million
	FY28	37.6	30	77	907	

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 demand 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 Riverstone East and Schofields development area, we have considered individual non-network technologies. Our assessment is summarised in table 13.

[2] 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.

Table 13 – 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 Riverstone East and Schofields development 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 would not defer network investment. It also requires customers to connect to the network, which is not feasible with the existing network in the development area.
Commercial direct load control	Not feasible because the precincts being addressed in the Riverstone East and Schofields development 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 Riverstone East and Schofields development 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 demand continues to grow following the establishment of the initial network supply assets for the Riverstone East and Schofields development area. We are expecting rooftop solar penetration of 40% in the new development area, however this will not be installed until the new residential dwellings are constructed which will not commence until the require network assets are commissioned.

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.[3] Regulated SAPS are set out in section 6B of the National Electricity Law (NEL), which defines a SAPS as a system that:[4]

- 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.

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

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

5. Conclusion

The North West Priority Growth Area has been identified by DPE as an area of substantial growth. This includes the Riverstone East and Schofields Development Area – i.e., the planned precincts of Riverstone East, Riverstone, Riverstone West, Schofields, West Schofields, and Alex Avenue within the North West Priority Growth Area.

Demand in the Riverstone East and Schofields development area is forecast to grow to approximately 149MVA by 2043/44 from a current peak demand level of approximately 64MVA. The existing network supplying the area – namely the Schofields ZS, Riverstone ZS and the existing 11kV network – are not sufficient to provide the supply capacity and the connection capability to support the projected future growth of these precincts.

Based on the extent of the forecast demand for the Riverstone East and Schofields Development 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 residential developments continue to increase, and the uptake of electric vehicles, including electric buses, begins to offer opportunities in the vehicle-to-grid capability for network support. These developments will be closely monitored as precincts in the Riverstone East and Schofields Development Area develop over the next decade and will be considered as part of future network augmentations.

CONTACT

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Endeavour Energy

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