CITIPOWER

AUGMENTATION

BRUNSWICK MODERNISATION

CP BUS 3.03 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Overview

The Brunswick area is situated north of Melbourne's CBD in the inner-northern suburbs of Melbourne, with demand growth driven by infill growth and electrification. The Brunswick area is currently served by four operational zone substations – West Brunswick (WB), Brunswick (BK), Fitzroy (F) and Collingwood (CW).

The Brunswick (BK) and Fitzroy (F) zone substations are approaching their end of life and must be managed towards failure.

Some parts of the Brunswick supply area are also serviced by low capacity 6.6kV distribution networks. 6.6kV networks are effectively 'islanded' from more modern, higher capacity 11kV distribution networks.

We have an ongoing Regulatory Investment Test for Distribution (RIT-D) that sets out our preferred option to manage the BK and F zone substations towards retirement, which are to offload F to CW and BK to WB. These works are scheduled to commence in FY25 and continue into the 2026–31 regulatory period. Given the offload projects are ongoing, they are assumed to proceed for the purposes of assessing our preferred option to manage forecast demand growth.

To manage forecast load growth in the Brunswick area, the preferred option is to install a third transformer at the CW zone substation. This option is preferred because it addresses the identified need and provides the highest net economic benefits for customers.

Expenditure forecasts for the preferred option are shown below in table 1.

TABLE 1 EXPENDITURE FORECASTS: BRUNSWICK SUPPLY AREA ($M, 2026)

PROJECT	FY27	FY28	FY29	FY30	FY31	TOTAL
Offload F to CW	8.1	19.5	-	-	-	27.5
Offload BK to WB	18.8	-	-	-	-	18.8
New third transformer at CW	-	-	-	6.1	6.1	12.2
Total	**26.9**	**19.5**	**-**	**6.1**	**6.1**	**58.5**

2. Background

The Brunswick area is situated north of Melbourne's CBD in the inner-northern suburbs of Melbourne. Brunswick is characterised by historical low-density dwellings and is home to many people who work in the CBD.

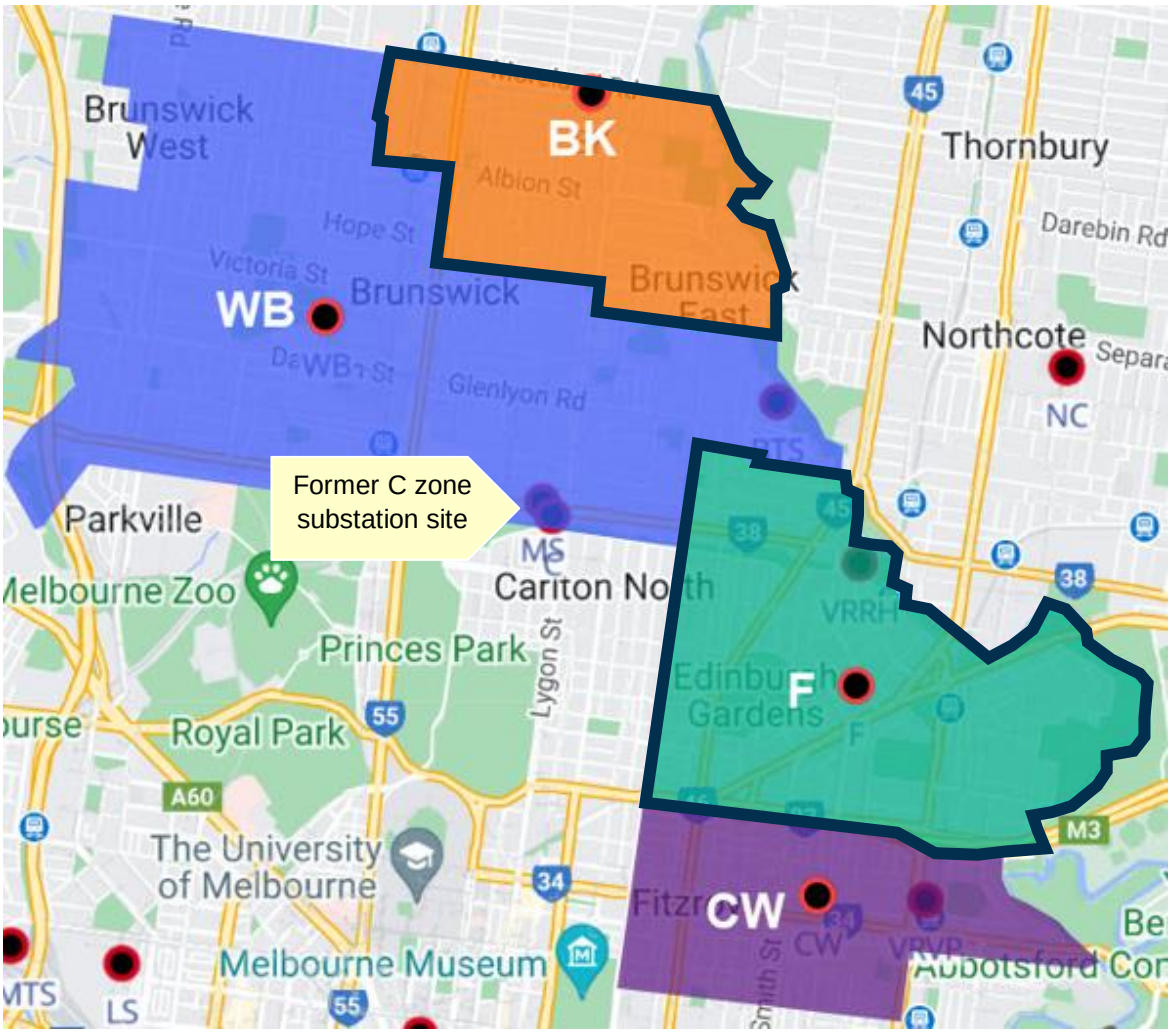
2.1 Existing distribution network

The Brunswick area of our network is supplied by the Brunswick terminal substation (BTS) and West Melbourne terminal station (WMTS). This area is further serviced by four operational zone substations that distribute power throughout the Brunswick local area—West Brunswick (WB), Brunswick (BK), Fitzroy (F) and Collingwood (CW).

A further Brunswick (C) zone substation was decommissioned in 2022 after reaching its end-of-life.

Figure 1 shows the locations of theses zone substations, including those discussed in this business case.

FIGURE 1 MAP OF BRUNSWICK AND FITZROY SUPPLY AREAS



2.1.1 Two zone substations are being managed towards retirement

Two of the zone substations in the Brunswick supply area, Brunswick (BK) and Fitzroy (F), were constructed in the early 1960s and are approaching their end-of-life. These zone substations are serviced by transformers that are over 70 years old and are in poor condition that is unsatisfactory to maintain a safe and reliable electricity supply for our customers. One transformer at F has been permanently declared out of service due to oil analysis indicating an internal thermal defect that is a safety issue.

A disruptive failure at either of these zone substations would result in outages or load shedding, presenting a significant risk of supply interruptions for Melbourne's inner-northern areas.

2.1.2 Upgrading legacy 6.6kV networks with modern 11kV networks

The Brunswick area is serviced by a combination of 6.6kV and 11kV distribution networks. The 6.6kV distribution network is a legacy technology that was industry standard practice when these areas were first electrified. The 11kV distribution network is modern industry practice for efficiently servicing areas of greater population density due to its higher network capacity, better voltage performance and lower line losses.

Utilising two different operating voltages means that the area is supplied by two 'islanded' networks that cannot be operationally interconnected. This constrains our ability to restore supply to customers during outages because we cannot use the 6.6kV network to support the 11kV network and we cannot use the 11kV network to support the 6.6kV network.

2.2 Strategic approach to the brunswick supply area

To manage the retirement of poor condition assets at our F and BK zone substations, and to address our inability to reconfigure the network, we undertook a strategic review in the lead up to the 2021–26 regulatory period that investigated how to efficiently modernise supply in the Brunswick area. Our review, supported by GHD as an independent technical adviser, considered both network and non-network options.

We found that a program to offload and retire F and BK by transferring their loads to nearby zone substations was the most efficient solution, where F would be offloaded to Collingwood (CW) and BK would be offloaded to West Brunswick (WB).

The program included upgrading the 6.6kV network in the area to 11kV, which would support enhanced ability to operationally reconfigure our network in the event of an outage to improve supply reliability for customers. This option was proposed as part of the 2021–26 regulatory reset.[1]

Alternative options, for example redeveloping C and offloading F and BK to the redeveloped C, were considered but were not the preferred at the time as they did not deliver more value to customers than offloading F to CW and BK to WB.

The AER accepted the need for these works and included the corresponding expenditure in its 2021–26 regulatory determination.[2]

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1 CitiPower, Regulatory proposal 2021–2026, 2020, p. 67-69

2 Australian Energy Regulator, CitiPower Distribution determination 2021 to 2026 – Draft decision – Attachment 5 Capital expenditure, 2021, p. 56-57

2.2.1 Re-evaluation of the preferred modernisation program

Prior to commencing works to offload F to CW and BK to WB in the 2021–26 regulatory period, the global COVID pandemic created immediate changes in external circumstances that impacted our operating environment. The impacts of the pandemic were particularly acute for our CitiPower network, with peak demand and consumption in the CBD and inner-city (including Brunswick) falling by 20–30 per cent during lockdowns.

More generally:

- costs increased as a result of supply chain shortages and limited access to critical resources (such as those required to upgrade our network)
- demand reduced as working from home trends grew and our customers pursued lifestyle changes through relocating away from inner-suburban areas.

These changes cast considerable doubt on the timing of our Brunswick modernisation program that warranted holding off commencing these upgrades to ensure it was still the preferred solution.

2.2.2 Regulatory investment test for offload projects

Given this considerable uncertainty, we proceeded to re-evaluate the need for the program including re-assessing our demand forecasts, seeking new third-party cost estimates, investigating other credible options and identifying preferred timing.

Demand in the Brunswick area has rebounded since COVID with a shift towards returning to work, relocation back to inner-Melbourne areas, supported by increasing electrification and infill development.

Our re-evaluation of options is set out in our recently published Regulatory Investment Test for Distribution (RIT-D).[3] This RIT-D outlines our methodology and re-evaluation process to determine the most economic option to modernise the Brunswick area.

Pending any feedback from market participants and non-network proponents, the most economic option remains to offload both F to CW and BK to WB. These works are otherwise scheduled to commence in the current regulatory period, as shown in table 2 below.

TABLE 2 SUMMARY OF RIT-D: PREFERRED OPTION ($M, 2026)

PROJECT	FY25	FY26	FY27	FY28	FY29	FY30	FY31	TOTAL
Offload F to CW	1.2	7.7	18.8	-	-	-	-	36.4
Offload BK to WB	1.2	7.7	8.1	19.5	-	-	-	27.6
Total	**2.3**	**15.3**	**26.9**	**19.5**	**-**	**-**	**-**	**64.0**

[3] CitiPower, RIT-D: Brunswick and Fitzroy Supply Area – Notice of Determination Report (2025)

3. Identified need

The identified need in the Brunswick supply area includes the following:

- managing our end-of-life F and BK zone substations towards retirement while maintaining supply reliability
- modernising legacy 6.6kV infrastructure to improve operational flexibility and limit the impact of outages
- facilitating demand growth in the Brunswick area.

The focus of this business case, however, is the ongoing supply needs in the broader Brunswick supply area following the completion of the offload works outlined in our RIT-D. That is, following the retirement of our F and BK zone substations to our CW and WB zone substations respectively, the identified need is to facilitate ongoing demand growth.

We engaged directly with our customers to understand their perspectives on modernising our infrastructure, which are summarised below:[4]

Customer perspectives on modernisation

Customers through our engagement expressed high support for our proactive approach to modernising infrastructure, recognising the need to replace aging assets as it is essential for maintaining reliability and ensuring the network could support future electrification.

Customers prioritised holistic infrastructure planning and future-proofing the network, while preventing 'gold plating' and minimising community disruption.

"*The risk of waiting for things to fail is just too high, especially with the growing demands on the network*" – CitiPower forum participant

*"If we're going to upgrade, we should think ahead and build in extra capacity to avoid further disruption down the line" – Citi*Power forum participant

3.1 Managing end-of-life assets

As described in section 2.1.1, BK and F zone substations are serviced by transformers that are over 70 years old and are in poor condition.

Our RIT-D for the Brunswick modernisation projects showed that offloading F to CW and BK to WB is the most economic option to address increasing risks and consequences of failure.

As the offloads will be ongoing projects at the commencement of the 2026–31 regulatory period, we have assumed that the offloads are delivered, which addresses the need to manage end of life assets. For the remainder of this business case, we assume that the need to manage end-of-life assets has been met.

[4] Forethought, Test and Validate Roundtables, 2024, pp. 58-59

3.2 Modernising legacy 6.6kV distribution assets

As described in section 2.1.2, the Brunswick area is supplied by both 6.6kV and 11kV networks. Using two different operating voltages to supply the area effectively 'islands' both networks from each other, meaning they cannot be used to support each other in the event of an outage.

Our RIT-D for the Brunswick modernisation projects showed that offload works, which include upgrading the existing 6.6kV distribution network to 11kV, are the most economic option for the area.

As the offloads will be ongoing projects at the commencement of the 2026–31 regulatory period, we have assumed that the offloads are delivered, which addresses the need to modernise legacy 6.6kV distribution assets. For the remainder of this business case, we assume that the need to modernise legacy 6.6kV distribution assets has been met.

3.3 Facilitating demand growth in the brunswick area

We are forecasting demand growth in the Brunswick area that will outstrip the capabilities of our CW and WB zone substations. This is in addition to the rebound in demand after our customers started returning to work in the CBD and relocating back to the Brunswick area.

The Brunswick area is characterised by historical low-density residential housing that was built incrementally over the last century. The area is transitioning towards higher density living as Melbourne seeks to support higher population. We expect that future infill development and electrification will drive forecast demand growth in the area.

Figure 2 and figure 3 below show forecast demand growth at the CW and WB zone substations after the F and BK zone substations are offloaded at the end-of-life. The thermal capacity of the WB zone substation also increases as the distribution feeders supplied by the WB zone substation are upgraded from 6.6kV to 11kV as part of these offloads.

FIGURE 2 DEMAND FORECAST AT CW (11KV, MVA)

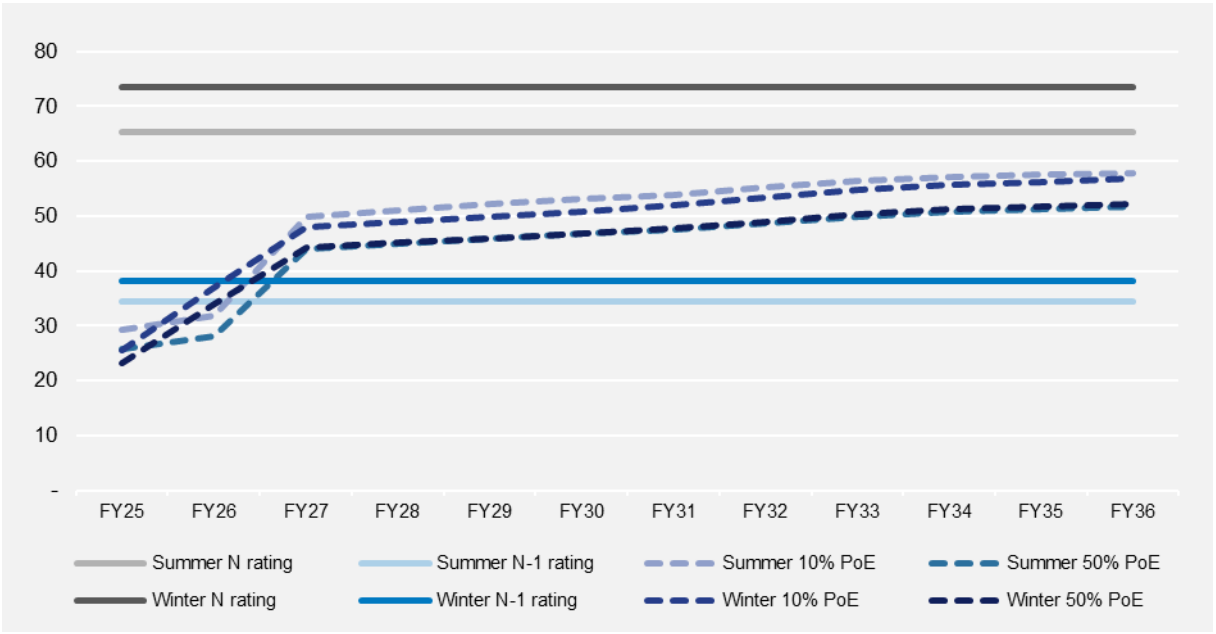
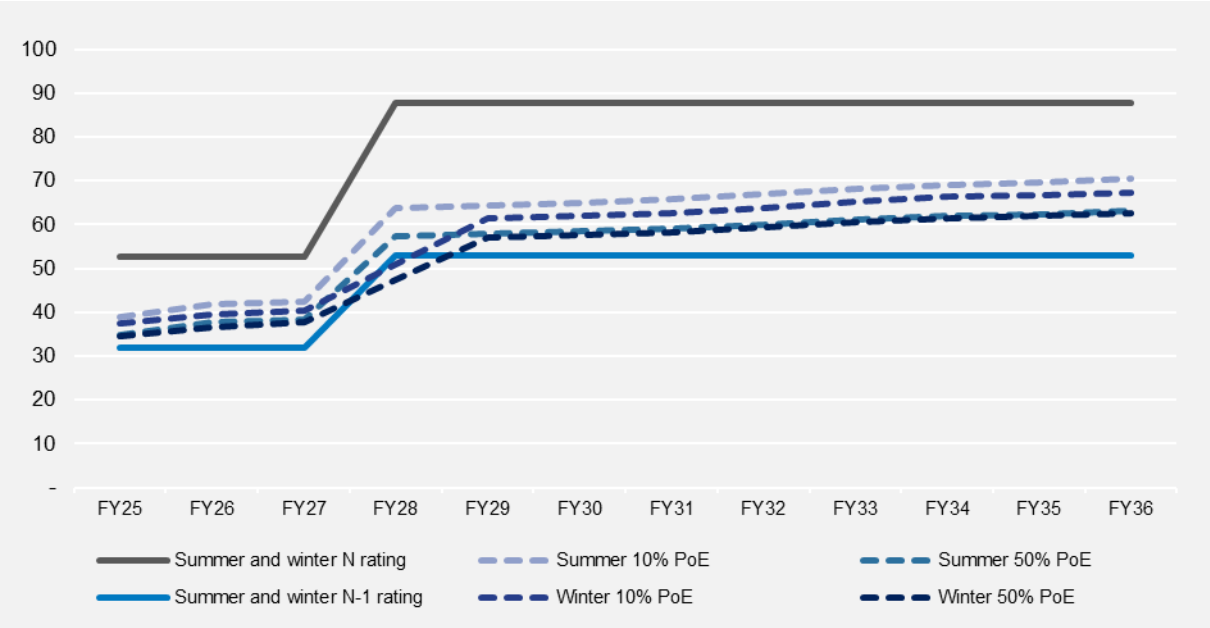
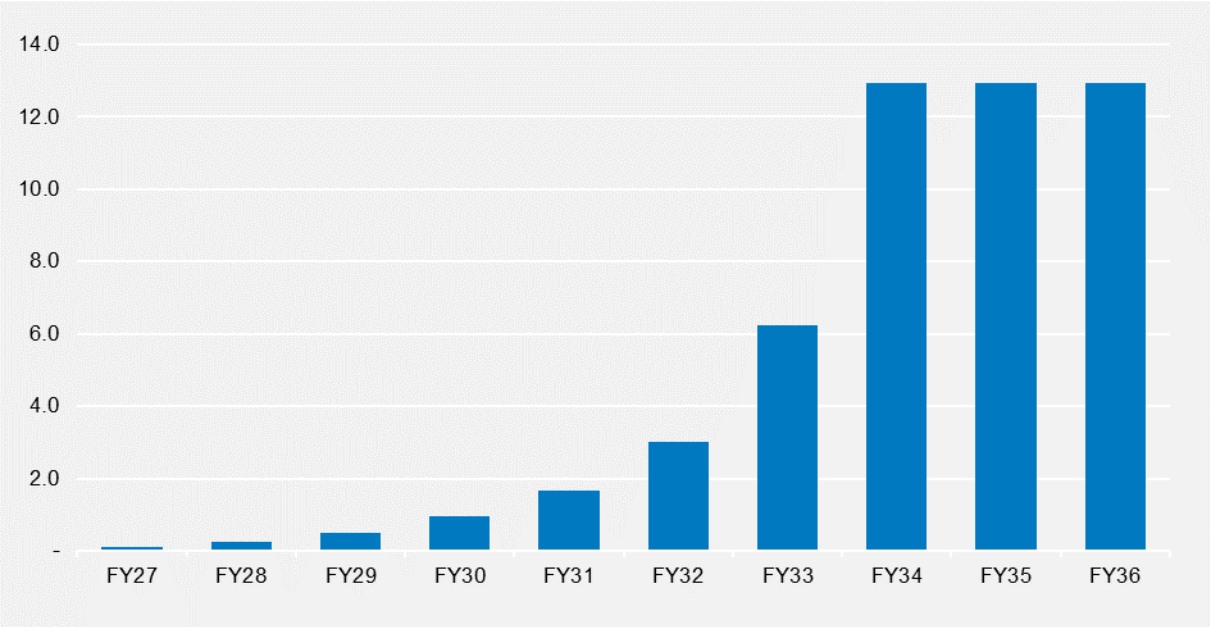


FIGURE 3 DEMAND FORECAST AT WB (6.6KV TRANSITIONING TO 11KV)



The total energy at risk across the cumulative supply area is also shown in figure 4. In both cases, the energy at risk is forecast to increase exponentially throughout the 2026–31 regulatory period, especially for the WB zone substation.

FIGURE 4 VALUE OF EXPECTED UNSERVED ENERGY ($M, 2026)



4. Assessment of credible options

Several credible options were considered to meet forecast demand growth in the Brunswick area that will be supplied by the WB and CW zone substations after the offloads from F and BK.

A summary of the costs, benefits and net present value of each option considered is described below in table 3.

TABLE 3 OPTIONS SUMMARY ($M, 2026)

OPTION		PV COSTS	PV BENEFITS	NET BENEFITS
1	Maintain status quo	-	-	-
2	Rebuild the C zone substation with transfers from CW and WB	-52.2	106.8	54.5
3	Install a third transformer and associated equipment at CW	-36.2	106.5	70.4

Further information describing each of our options can be found below. A full description of the costs, benefits and optimal timing of each option can be found in our detailed cost-benefit modelling.[5]

4.1 Option one: maintain status-quo

Maintaining the status-quo provides no mitigation of the energy at risk other than through currently available operational responses such as limited load transfers. This option will lead to increased risk of asset failures as the condition of BK and F continues to deteriorate, and increased risk and severity of supply interruptions as the forecast loads supplied by CW and WB increase.

This option fails to address the identified need to maintain reliability of electricity supply to customers within required standards and is not a credible option. All options are assessed relative to the base case.

4.2 Option two: rebuild the C zone substation with transfers from CW and WB

Following the offload projects, this option would redevelop our Brunswick (C) zone substation, which was previously decommissioned in 2022 after reaching its own end-of-life stage. This option would add approximately 110 MVA of capacity to the Brunswick area.

Our C zone substation is perfectly situated in the centre of all four existing zone substations in the Brunswick area and would be well placed to support load growth in the area. However, costs to redevelop the C zone substation would be relatively higher compared to other urban or regional zone substations because it is in a space-constrained area in inner-northern Melbourne.

[5] CP MOD 3.05 – Brunswick modernisation – Jan2025 – Public

The rebuilt C zone substation would be established to step down the 66kV voltage levels from the sub-transmission network to 11kV on the distribution network. Once C has been redeveloped, it would then support high loads on the CW and WB zone substations through transfers to share load growth across each zone substation in the area.

This option requires sub-transmission, zone substation and distribution feeder works, including:

- rebuilding the C zone substation, including all required assets to ensure safe and reliable operation
- thermal uprating of sub-transmission lines supplied by the Western Melbourne terminal station and new sub-transmission lines to support the C zone substation.

The present value of expenditure required under this option and the benefits of a newly redeveloped C zone substation with supporting transfers relative to the status quo are described in table 4 below.

TABLE 4 OPTION TWO: BENEFITS ASSESSMENT SUMMARY ($M, 2026)

OPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Rebuild the C zone substation with transfers from CW and WB	-52.2	106.8	54.5

4.3 Option three: install a third transformer and associated equipment at CW

Following the offload projects, this option would install a third transformer at our CW zone substation, which would add 30 MVA of capacity to our CW zone substation to support load growth in the Brunswick area.

This option requires zone substation upgrades, including the installation of a third 66 to 11kV 30MVA transformer at the CW zone substation and all required assets to ensure safe and reliable operation of the transformer.

This option addresses the forecast unserved energy at CW and WB after offloading F to CW and BK to WB.

The present value of expenditure required under this option and the benefits of installing a third transformer at the CW zone substation relative to the status quo are described in table 5 below.

TABLE 5 OPTION THREE: BENEFITS ASSESSMENT SUMMARY ($M, 2026)

OPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Install a third transformer and associated equipment at CW	-36.2	106.5	70.4

4.4 Option four: non-network solution

We have recently commenced a RIT-D process and published a notice of determination and draft project assessment report to address the need to manage end of life zone substations and modernise legacy 6.6kV distribution assets in the Brunswick area. The RIT-D process demonstrated that none of

the non-network or SAPS options, or combinations of these options that could feasibly address these needs.[6]

To address the identified need of facilitating demand growth in the Brunswick area, a non-network or SAPS solution would need to address forecast energy at risk and also be required to be available at all times of the year to maintain supply reliability (following the safe decommissioning of BK and F).

Given these requirements, and the outcomes of our RIT-D process for the feeder offload projects, it is unlikely that a non-network solution or SAPS could be technically and economically viable to address the identified need.

However, we will continue to publish information on this constraint and project in the Distribution Annual Planning Report (DAPR) and apply our Demand Side Engagement Strategy for this project to ensure that non-network providers are given the opportunity to propose economic solutions that are technically and economically viable.

With the level of investment required for the most expensive credible option, this project will be subject to a new regulatory investment test for distribution (RIT–D) before investment. This will maximise the chance of a viable non-network solution being identified through the engagement of non-network service providers during the RIT-D consultation.

[6] CitiPower, RIT-D: Brunswick and Fitzroy Supply Area – Notice of Determination Report (2025)

5. Preferred option

The preferred option to address the identified need of facilitating demand growth In the Brunswick area across the 2026–31 regulatory period is option three, to install a third transformer at the CW zone substation. This option is preferred because it addresses the identified need and provides the highest net economic benefits for customers.

Without this project, the increasing risk of asset failure at F and BK perpetuates the increasing risk of supply interruptions for customers and there would be insufficient system capacity to supply forecast demand or manage forecast energy at risk.

This option would be implemented during the 2026–31 regulatory period, following the offload of F to CW and BK to WB that is commencing in the 2021–26 regulatory period and concluding in the 2026–31 regulatory period. Offloading BK to WB will include upgrading the distribution network currently supplied by the BK zone substation to function at 11kV, allowing the WB zone substation to take on loads from the BK zone substation safely.

A detailed economic assessment of the optimal timing for option three, located in our attached cost benefit modelling, shows the net economic benefits of installing the third transformer at CW are maximised if this project is commissioned by FY32, as shown in figure 5 below.[7]

FIGURE 5 TIMING OF PREFERRED OPTION ($'000, 2026)

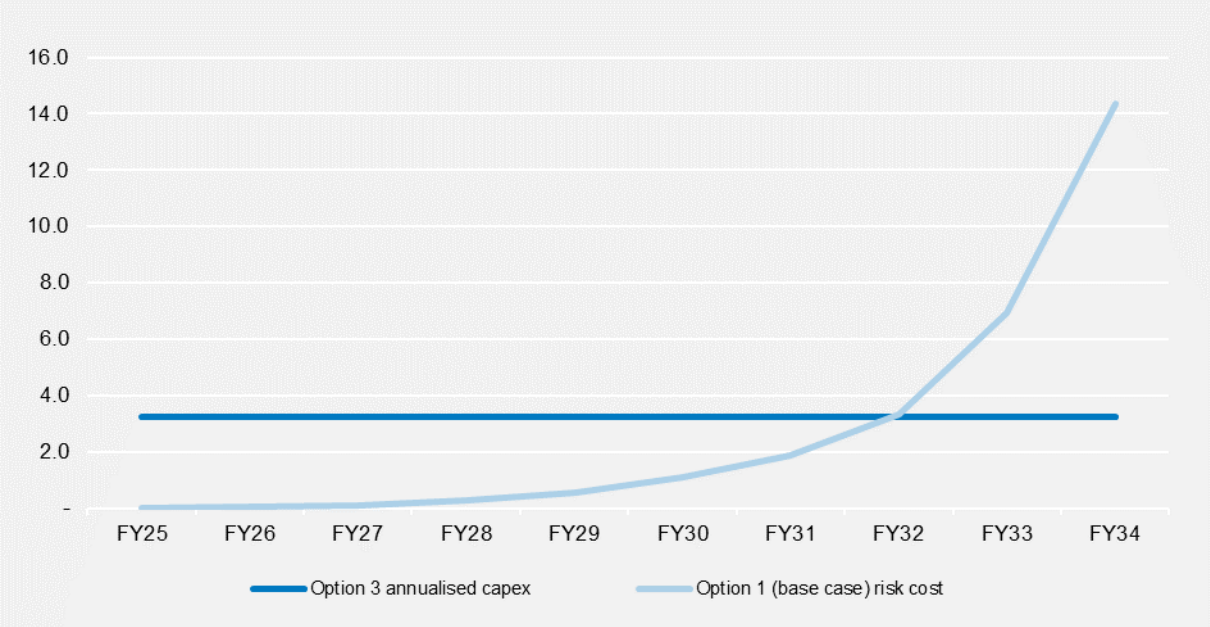


Table 6 below shows the capital expenditure forecast for the preferred option.

For completeness, the full capital expenditure forecast for the broader Brunswick supply area, including the corresponding offload projects that will be commenced in the current regulatory period, is set out in table 7 below.

[7] CP MOD 3.05 – Brunswick modernisation – Jan2025 – Public

TABLE 6 EXPENDITURE FORECASTS: PREFERRED OPTION ($M, 2026)

PROJECT	FY27	FY28	FY29	FY30	FY31	TOTAL
Install a third transformer and associated equipment at CW	-	-	-	6.1	6.1	12.2

TABLE 7 EXPENDITURE FORECASTS: BRUNSWICK SUPPLY AREA ($M, 2026)

PROJECT	FY27	FY28	FY29	FY30	FY31	TOTAL
Offload F to CW	8.1	19.5	-	-	-	27.5
Offload BK to WB	18.8	-	-	-	-	18.8
New third transformer at CW	-	-	-	6.1	6.1	12.2
Total	**26.9**	**19.5**	**-**	**6.1**	**6.1**	**58.5**

5.1 Sensitivity analysis

Sensitivity analysis was undertaken to understand the impact of increasing costs and decreasing the value of energy at risk mitigated on the net economic benefits of each option in different scenarios. Option three provides the highest net economic benefit under all scenarios and remains the preferred option. Further information on our sensitivity analysis can be found in our attached cost benefit modelling.[8]

[8] CP MOD 3.05 – Brunswick modernisation – Jan2025 – Public

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