Business case: Hindley Street Substation 66kV Replacement

2025-30 Regulatory Proposal

Supporting document 5.3.10

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SA Power Networks

Empowering South Australia

Contents

Glossary

Acronym / term	Definition
AER	Australian Energy Regulator
BAU	Business as Usual
Capex	Capital expenditure
CB	Circuit Breaker
CBD	Central Business District
DER	Distributed Energy Resources
EDC	Electricity Distribution Code
ESCOSA	Essential Services Commission of South Australia
GIS	Gas Insulated Switchgear
HI	Health Index
HV	High Voltage
kV	kilovolt
LV	Low Voltage
MW	Megawatt
MVA	Megavolt Ampere
NEM	National Electricity Market
NER	National Electricity Rules
NPV	Net Present Value
Opex	Operating expenditure
PoE	Probability of Exceedance
RCP	Regulatory Control Period
SCS	Standard Control Services
SLD	Single Line Diagram
VCR	Value of Customer Reliability

1 About this document

1.1 Purpose

This business case is driven by the need to address significant reliability and safety risks associated with SA Power Networks' ageing and poor condition assets at the Hindley Street substation, used in the provision of Standard Control Services (**SCS**).

This document describes the need, identifies, and evaluates options to address the need, and selects a preferred option for investment which is proposed to be delivered as part of our replacement program for the 2025-30 Regulatory Control Period (**RCP**).

1.2 Expenditure category

- Network capex: Replacement Expenditure (repex)

1.3 Related documents

Table 1: Related documents

Doc number	Title
5.3.1	Network asset replacement expenditure business case
5.2.5	Resourcing Plan for Delivering the Network Program
	Hindley Street Substation NPV Model
	Circuit Breaker Asset Plan
5.3.12	CBD Reliability Business Case

2 Executive summary

This business case recommends capital expenditure (**capex**) of $28M ($June 2022 exclusive of overheads) to replace all outdoor 66kV switchgear, buswork and structures at the Hindley Street substation in 2026.

The Hindley Street substation is one of four critical zone substations supplying the Adelaide CBD and is part of the meshed 66kV metropolitan east network. It is supplied via two 66kV cables, one from Whitmore Square and one from North Adelaide / Croydon.

The existing outdoor 66kV yard at the Hindley Street substation is extremely congested, with overhead pipework structures, a string bus and three aged bulk oil Circuit Breakers (**CBs**) manufactured in 1954. These are the only three of this type of CB remaining in the network.

The age and condition of the existing switchgear poses a significant reliability and safety risk to both our personnel and the public, with thousands of pedestrians passing by every day within a few metres of deteriorated CB bushings and cable terminations. Catastrophic failure of a CB, or failure with an explosion or fire, is likely to result in an extended substation outage with approximately 43MW of CBD load at risk. Only 21MW of the 11kV load can be transferred to other CBD feeders.

Catastrophic failure is also a significant safety risk to our personnel and the public because it often results in oil catching on fire and porcelain debris.

Most of the disconnectors at the Hindley Street substation, are defective or inoperable and no longer provide safe points of isolation. The configuration of the existing bus structures does not allow for piecemeal replacement of equipment with a modern equivalent. A single major plant failure, even if not catastrophic, will incur a lengthy replacement timeframe because the existing layout is congested and cannot accommodate an additional line or transformer bay.

We considered a range of options to address the need. The **recommended option** is to replace the aged outdoor 66kV switching equipment and bus with a new indoor Gas Insulated Switchgear (**GIS**) switchboard at a total cost of $28M ($June 2022 exclusive of overheads). The project is efficient with benefits outweighing costs with a positive Net Present Value (**NPV**) of $25.1M.

The project will address all reliability and safety risks associated with the existing 66kV outdoor equipment and structures and provide additional spare bays for future lines and transformers. The upgrade will also allow for all 66kV protection and transformer relay panels to be removed from the control building which is extremely congested. The switchboard will be located in a new multi-story building on an adjoining SA Power Networks property that is currently leased to a third party. The new building and switchgear can be fully constructed while the substation remains in service, followed by a staged cutover of the incoming 66kV lines and transformers. Construction is planned to commence in 2026.

Other options were investigated and found to have a lower NPV or to be non-viable, due to unacceptable safety risks and extended outages impacting thousands of customers.

3 Background

3.1 The scope of this business case

This project seeks to address the increasing risks to safety of personnel, public and reliability to customers in the Adelaide CBD due to the poor condition of the existing 66kV outdoor switchgear and equipment at the Hindley Street substation.

3.2 Regulatory context

SA Power Networks have a duty to take 'reasonable steps' to ensure the distribution system is safe and safely operated (Section 60(1) of the Electricity Act) and to maintain and operate the distribution system in accordance with good electricity industry practice (NER Clause 5.2.1(a)). Further, under the National Electricity Rules (**NER**), we are required to maintain the quality, reliability and security of supply of standard control services and maintain the reliability, safety and security of the distribution system. These duties require us to have regard to objectively determined standards of safety.

Within the CBD, we are subject to stringent network reliability service standard targets set by the Essential Services Commission of South Australia (the Commission, or **ESCoSA**) in its Electricity Distribution Code (**EDC**).

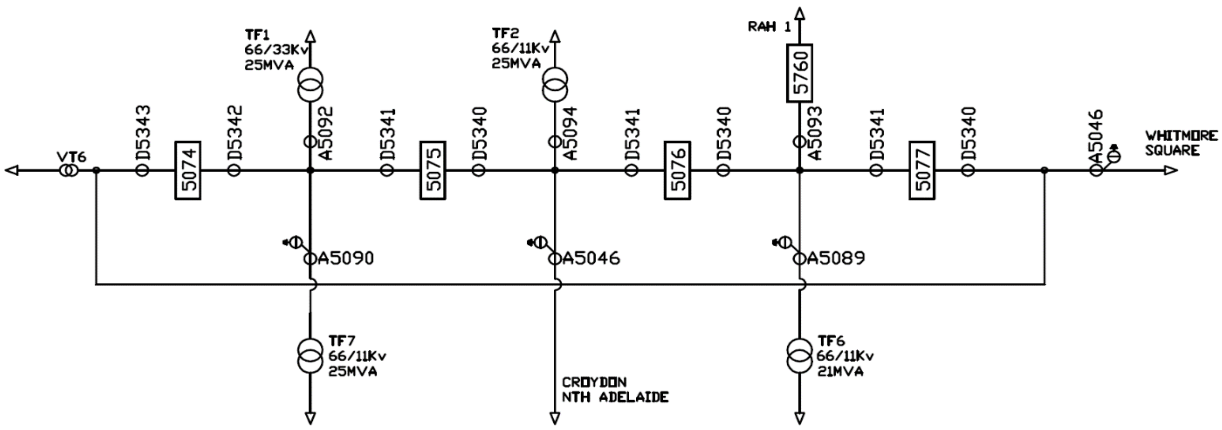
3.3 Our performance to date

The Hindley Street substation is one of four major zone substations supplying the Adelaide CBD 33kV and 11kV networks, and it forms part of the meshed 66kV metropolitan east network. The Hindley Street substation is supplied via two 66kV cables, one from Whitmore Square and one from North Adelaide / Croydon. In addition to being one of the major CBD zone substations, the Hindley Street substation provides one of two 66kV supplies to the Royal Adelaide Hospital and it supplies the western CBD medical health precinct.

The Hindley Street substation consists of three 66/11kV transformers and one 66/33kV transformer. Refer to Figure 1 below for a simplified Single Lind Diagram (**SLD**). The 66/11 transformers supply an 11kV CBD forecast load of 43.6MVA. Less than half of this load can be transferred to adjacent substations, leaving

22.7MVA at risk in the event of an entire substation outage. The 66/33kV transformer supplies a meshed 33kV network, with supply also from two transformers at East Terrace substation. The entire 33kV load can be supplied from East Terrace provided both East Terrace transformers remain in service.

Figure 1: Simplified SLD of Hindley Street Substation



The outdoor 66kV switchyard comprises of outdated overhead flexible conductors, manually operated disconnectors with ground level operating levers and five 66kV CBs. Three of the CBs are bulk oil CBs. These CBs are in very poor condition and have been in service for 69 years. Refer to Figure 2 (left).

The Hindley Street substation is located near the center of the Adelaide CBD, and adjacent the University of South Australia western campus with high pedestrian traffic directly outside the substation wall. Much of the outdoor switchyard is built above the wall height including bushings and cable terminations, posing a significant safety risk in the event of failure. Refer to Figure 2 (right).

Figure 2: Bulk oil CBs below disconnectors (Left), and close proximity to CBD Street (Right)

There are presently 15 recorded defects associated with 66kV disconnectors alone, and five recorded defects associated with the 66kV bulk oil CBs. Defects include hot joints, cracked insulators, contacts not fully closed and CB oil leaks.

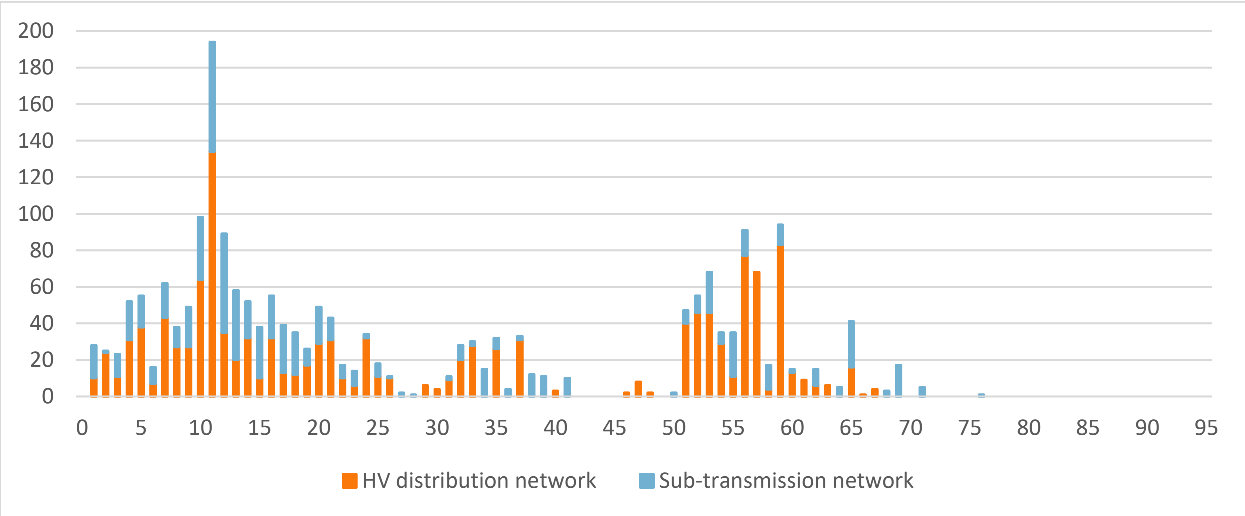
With the unsafe configuration of overhead buswork, congested layout and severely deteriorated disconnectors, significantly limits the ability to isolate individual plant items. This results in deferral of repairs and further increases safety and reliability risks. An accumulation of defects across multiple plant items is causing increasing risk to the CBD reliability and safety.

Failure of a single high voltage (**HV**) asset could rapidly escalate into catastrophic failure of the entire outdoor switchyard with a lengthy outage of the substation and significant CBD loss of supply. This is in addition to the significant safety risk to both SA Power Networks' personnel and the public, being in a busy CBD street.

3.4 Drivers for change

The three 66kV bulk oil circuit breakers are in poor condition after 69 years of service and increasingly likely to fail in the next 5 years. The typical service life for a CB in SA Power Networks' distribution system, is around 55 years, refer to Figure 3 below. The 66kV bulk oil CBs have the highest probability of failure of any HV CBs in the network, with a Health Index (**HI**) of 8.3[1].

Figure 3: SA Power Networks' CB Age Profile



The overhead disconnectors are also in very poor condition, with some unable to be switched live. In most cases there is no direct repair or replacement option. Based on the current trend, there is expected to be a significant increase in defects in the next five years. This will require interruptions to supply, to access plant for critical defect repair and maintenance.

Future augmentation drivers also exist for the Hindley Street outdoor switchyard. These are unquantified owing to the uncertainty of their timing and include:

- enabling a future 66kV connection to a new CBD substation (nominally Eliza Street);
- enabling a future 66kV connection to the East Terrace substation; and
- meeting future 11kV or 33kV demand with additional transformers.

[1] Health Index for Circuit Breakers detailed in Reference [4]: Circuit Breaker Asset Plan.

3.5 Industry practice

Replacing poor condition high risk CBs is common practice for distribution networks. The typical service life in the National Electricity Market (**NEM**) is significantly less than the 69 years of service the Hindley Street CBs have seen. Furthermore, most networks have either phased out or are near phasing out their populations of bulk oil CBs due to the high risks that they pose.

3.6 Other CBD expenditure

Our Regulatory Proposal for the 2025-30 RCP includes other CBD expenditure in addition to that recommended in this business case. The other expenditures are to address specific identified needs related to the Adelaide CBD. These are shown in Table 2 for transparency.

It is important to note that these expenditures do not address the specific reliability and safety risks associated with the Hindley Street substation and are included for information only.

Table 2: Proposed CBD expenditure covered in other business cases ($June 2022)

REPEX (000's)	**$99,800**
CBD Switching Cubicle Replacements [2]	$3,500
CBD Transformer Replacements [2]	$1,500
Manhole Repairs and Link boxes [2]	$2,000
Substation Equipment Replacement (General) [2]	$13,800
CBD Reliability [3]	$79,000
AUGEX (000's)	**$9,800**
CBD 33kV Substation Conversions [4]	$9,800
Total (000's)	**$109,600**

4 The identified need

The Hindley Street substation 66kV switchyard is in very poor condition, a high failure risk and in need of replacement. The reliability risk is very significant, with up to 21MW of load unable to be supplied from an alternative substation. The safety risk is also very high to both SA Power Networks personnel and the public, being located close to the center of the Adelaide CBD with high pedestrian traffic.

Failure of a single HV asset, can rapidly escalate into catastrophic failure of the entire outdoor switchyard. A lengthy outage of the entire substation will be necessary, with significant loss of CBD load and possible high risk safety consequences.

[2] Included in the Network Asset Replacement Expenditure Business Case (5.3.1).

[3] Included in the CBD Reliability Business Case (5.3.12).

[4] Included in the SAPN 2025 – 2030 Reset Business Case – Augex Safety (5.8.5).

4.1 Responding to Customer Feedback

In considering potential responses to this driver, we engaged with our customers on their desired service level outcomes balanced against price outcomes.[5] We also considered our applicable regulatory obligations / requirements. As a result of these considerations, the identified need is described as follows:

a. to respond to customers' concerns,[6] identified through our consumer and stakeholder engagement process, regarding their explicit service level recommendations that we:
   - maintain reliability service performance by geographic region;
   - invest sufficiently to maintain and improve CBD reliability to comply with ESCoSA's jurisdictional network reliability service standard target in 2025-30; and
   - maintain safety service performance in aggregate – driven by a desire to not see deterioration in the safety risk posed by the network;

c. to maintain the reliability service performance of our network; and

d. to maintain the safety performance of our distribution network in relation to the risks of harm to workers, and the community.

5 Comparison of options

5.1 The options considered

Two options were considered in addition to the base case of recurrent expenditure. The forecast capex is $2022 exclusive of overheads.

Table 3: Summary of options considered

Option	Description
The base case – Business as Usual	Continue business as usual. Maintain equipment in accordance with established routines. Accept increasing risk of failure and the corresponding consequences of possible long-term loss of supply to a major portion of the CBD and potential serious injury or loss of life. Capital Cost: $0 (maintenance and refurbishment costs captured as BAU)
Alternative options	
Option 1 – New 66kV GIS Switchboard	Replace all existing outdoor 66kV switchgear and bus arrangement with a modern indoor GIS switchboard. This option will eliminate all the identified reliability and safety risks and provide a foundation for future augmentation, including increased meshing of the 66kV network via connections to East Terrace and the future City Central Eliza Street substation. Capital Cost: $28M
Option 2 – Piecemeal CB and Termination Replacement	This option includes replacement of the three aged circuit breakers and a set of 66kV cable terminations, reducing the reliability and safety risk of a catastrophic failure. It does not remove the operational, safety and failure risks associated with the existing overhead bus and disconnectors, which are not practical to replace with a modern equivalent due to space limitations. Capital Cost: $4.5M

5 This was undertaken in an aggregate way across all of our potential network asset replacement activity, with the specific circumstances of the Hindley Street Substation not covered directly.

6 This is pursuant to Clause 6.5.7(c)(5A) of the NER, which requires regard to be had to the extent to which forecast capex seeks to address the concerns of distribution service end users identified by the distributor's engagement process.

5.2 Failure scenarios for the calculation of unserved energy

To calculate the benefits of capital investment, two failure scenarios are considered.

Scenario 1

A single CB (e.g., CB5076, refer to Figure 1 above) fails in a non-catastrophic manner (i.e., without explosion or fire) that renders it unable to be returned to service. E.g., internal failure with the fault cleared via fast protection. In this example, the two adjacent CBs, CB5075 and CB5077, will operate to clear the fault.

Consequences

Immediate loss of the 66kV sub-transmission cables to the Croydon substation and the Royal Adelaide Hospital (RAH1), and loss of 66/11kV transformers 2 and 6. Transformer 7 will be the only 66/11kV transformer remaining in service, resulting in immediate loss of 9.91MW of 11kV CBD load.

The initial loss of 11kV load can be restored by staged switching to adjacent substations within 24 hours, leaving Transformer 7 operating at its emergency rating of 33.7MVA. If Transformer 2 or 6 cannot be restored, additional load would need to be transferred to adjacent substations to reduce the load on Transformer 7 to its normal rating.

Restoration of Transformer 2, 6, and the 66kV sub-transmission cables relies on successful isolation of CB5076 via disconnectors. Due to defects and the difficulty in accessing these disconnectors for repairs and maintenance, it may not be possible to operate these disconnectors. In this case, a larger forced interruption would be required to disconnect the CB by manually unbolting the connections.

Scenario 2

Explosive failure of one CB resulting in collateral damage to adjacent equipment, rendering the 66kV yard inoperable.

Consequences

The immediate loss of the entire Hindley Street substation; 43.61MW of 11kV CBD load.

The maximum load able to be transferred to adjacent substations is 20.85MW. This is achieved by staged switching over a 24 hour period, leaving 22.76MW of unserved energy on the 11kV CBD network. Existing contingency plans will be enacted to establish a temporary overhead 66kV line to Transformer 2 via installation of poles along Hindley Street requiring a full street closure. Most pole footings for this contingency have already been installed. Estimated construction time to enact this contingency is 2 weeks. Once Transformer 2 is restored there will be no unserved energy at risk.

The two scenarios have been assessed in accordance with SA Power Networks Risk Assessment Framework and are presented in Table 4 below.

Table 4: CB failure risk assessment

ID	Risk Scenario	Consequence Description	Consequence Category	Consequence	Likelihood	Risk Level
1	CB Failure (non catastrophic)	Multiple CBD feeders outage	Network	3 (Moderate)	4 (likely)	High
2	Catastrophic CB Failure resulting in damage to most of the 66kV yard	Entire substation outage, CBD feeder outages >24 hours	Network	4 (Major)	2 (unlikely)	Medium
		Multiple injuries to staff or public	Safety	4 (Major)	2 (unlikely)	Medium

5.3 Calculation of the unserved energy if action is not taken

The cost of unserved energy has been calculated using the following parameters:

Common parameters

- VCR = $47.69/kWh (using the AER's VCR method published December 2022, accounting for location and type of load supplied by the Hindley Street Substation)
- Mean probability of failure = 2035 (i.e. CBs 81 years old at mean time of failure)

Scenario 1 parameters

- Weighting of scenario 1 = 95%
- Full restoration of load within 24 hours via staged switching to adjacent substations
- Disconnectors able to be operated to allow isolation of the defective circuit breaker (required for restoration of 66kV lines and 66/11kV transformers.

Scenario 2 parameters

- Weighting of scenario 2 = 5%
- Restoration of 20.85MW load within 24 hours via staged switching to adjacent substations
- Temporary 66kV line installed in 2 weeks
- No damage to Transformer 2
- No damage to indoor equipment including the protection panels and 11kV switchboard.

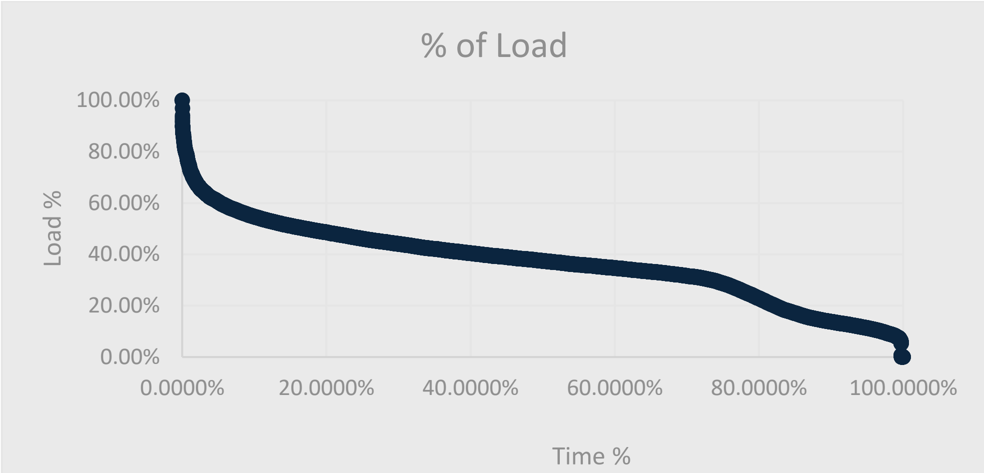
Unserved energy for access, maintenance, and defect repair

Due to the deteriorating condition of the 66kV disconnectors, it is reasonable to assume they cannot be safely operated while energised. This has become an increasing trend prompting an increase in repex for substation disconnectors. However, in the case of the 66kV disconnectors at the Hindley Street substation, there is no direct replacement owing to the bus design and lack of space. There are 15 disconnectors on the 66kV bus with a total of 15 current defect notifications assigned. Typical defects include hot joints, contacts not fully closed and cracked insulators. Consequently, an increasing number of the 66kV disconnectors require de-energisation prior to operating which interrupts supply due to a lack of capacity to transfer load to adjacent substations.

Routine CB maintenance is scheduled every six years, with five CBs on site. Assuming the maintenance and defect repair of all CBs can be bundled to minimise disruption, this will result in four eight-hour outages every six years for maintenance purposes alone. That is, one outage to isolate and earth a work area for maintenance, and another to restore every three years. The cost of unserved energy for these outages is averaged across the period.

The Hindley Street substation load duration curve based on 2018/19 data is presented in Figure 4 below. When estimating the load at risk, SA Power Networks applied the average load from 2018/19 because more recent data does not accurately represent future loads due to the effects of COVID-19 and mild summers. 50% of the time, the load is found to be at 37.7% or more of the peak load. This is used in the calculation of unserved energy for access, maintenance and defect repair.

Figure 4 – Hindley Street Substation load duration curve (2018/2019 data)



Summary of Unserved Energy

A summary of the calculated unserved energy is presented in Table 5 below. Refer to the Hindley Street Substation NPV Model for further breakdown.

Table 5: Summary of unserved energy

ID	Unserved Energy
Scenario 1	9.91MW x 24 hours
Scenario 2	43.61MW x 24 hours 22.76MW x 168 hours
Access for maintenance and defect repair	22.76MW x 16 hours x 1/6 years

5.4 Analysis summary and recommended option

5.4.1 Quantified Benefits and NPV

The costs, quantified benefits and risks of alternative options relative to the base case over a 20-year period, $M June 2022 exclusive of overheads. The Option 0 (Base Case) costs have been subtracted from all options. A central case of input parameters is presented which we consider the most reasonable and produces the proposed recommendation. A low benefits, high benefits, and weighted benefits case is presented, which does not change the recommended option. Refer to the Sensitivity Analysis for discussion.

Central case

Option	Costs		Benefits	NPV	Risk Level	Ranking
	Capex (PV)	Capex 25-30 ($2022)	(PV)		(Residual)	
Option 0 (Base Case) BAU	-	-	-	-	High	Not credible
Option 1 – GIS Switchboard	15.2	28	40.3	25.1	Minimal	1
Option 2 – CB Replacement	3.3	4.5	3.9	0.5	Low	2

Low benefits case

Option	Costs		Benefits	NPV	Risk Level	Ranking
	Capex (PV)	Capex 25-30 ($2022)	(PV)		(Residual)	
Option 0 (Base Case) BAU	-	-	-	-	High	Not credible
Option 1 – GIS Switchboard	19.5	28	9.5	-10.0	Minimal	2
Option 2 – CB Replacement	4.2	4.5	-2.4	-6.6	Low	1

High benefits case

Option	Costs		Benefits	NPV	Risk Level	Ranking
	Capex (PV)	Capex 25-30 ($2022)	(PV)		(Residual)	
Option 0 (Base Case) BAU	-	-	-	-	High	Not credible
Option 1 – GIS Switchboard	11.0	28	89.6	78.6	Minimal	1
Option 2 – CB Replacement	2.5	4.5	51.1	48.6	Low	2

Weighted case

Option	Costs		Benefits	NPV	Risk Level	Ranking
	Capex (PV)	Capex 25-30 ($2022)	(PV)		(Residual)	
Option 0 (Base Case) BAU	-	-	-	-	High	Not credible
Option 1 – GIS Switchboard	15.2	30.8	44.9	29.7	Minimal	1
Option 2 – CB Replacement	3.3	4.5	14.1	10.8	Low	2

5.4.2 Sensitivity Analysis

Sensitivity analysis was undertaken on the NPV calculation. The key sensitivities were found to be the outage duration or time to restore supply[7] and the failure scenario weighting. Other parameters varied include the VCR, Discount Rate and Probably of Failure set using the Mean Failure year.

The Central case uses historical averages of failure statistics for Substation Circuit Breakers. Two additional cases to the Central were considered in the sensitivity analysis: a Low Benefits case and a High Benefits case. For each, the parameters were adjusted as per the table below considering what a practical extreme case would be. The weighted NPV considers both the Central, Low and High Benefits case with the weights provided below.

Table 6: Variables applied for NPV sensitivity analysis

ID	Low	Central	High
Scenario 1 weighting	98%	95%	92%
Scenario 2 weighting	2%	5%	8%
Mean failure year	2040	2035	2030
Commercial discount rate	4.50%	4.05%	3.50%
Full restoration time (S2) [7]	1 week	2 weeks	3 weeks
VCR ($/kWh)	$23.85 (50% central)	$47.69	$52.46 (110% central)
Weights for Weighted NPV	25%	50%	25%

5.4.3 Unquantified Benefits

The unquantified benefits for each option are summarised below. Option 1 has significant unquantified benefits over the other options.

Table 7: Unquantified Benefits

Option	Benefits
Option 0 – BAU	Nil
Option 1 – New 66kV GIS Switchboard	Safety risk (risk of catastrophic CB or termination failure eliminated) • Eliminate potential multiple injuries to employees or public requiring surgery or hospitalization • Eliminate potential fatality Safety risk (risk of disconnector failure while switching) • Eliminate potential injury or fatality to SAPN personnel when operating the overhead 66kV disconnectors Reliability and operational risk • Avoid unplanned interruptions due to a failure of the outdoor 66kV buswork or disconnectors (which are replaced with this option). • Provide operational support to access, maintain and upgrade the 66kV network by providing switching and isolation points which can be operated live. Support future Augex projects beyond the 2025-30 RCP • Provides for future 66kV connections to East Terrace and Eliza Street substations • Provides for future additional 66/33kV transformers • Provides a foundation for future identified needs at Hindley Street substation, such as replacement of the 11kV and 33kV switchboards
Option 2 – Piecemeal CB and termination replacement	Safety risk (CB risk of catastrophic failure eliminated) • Eliminate potential multiple injuries to employees or public requiring surgery or hospitalization • Eliminate potential fatality

[7] Supply restoration time can vary significantly depending on the damage caused by the failure. That is, how much temporary infrastructure needs to be constructed to bypass damaged and failed equipment to restore supply.

5.4.4 Recommend Option

The recommended option is the replacement of all outdoor 66kV CBs, disconnectors, bus and structures with a modern indoor GIS switchboard; Option 1. Construction is scheduled to commence in 2026 with completion in the following year.

This is option is considered the only practical option, with numerous lengthy interruptions to supply for large numbers of CBD customers not tolerable. **The total capex is $28M ($2022 exclusive of overheads), with a NPV of $25.1M.**

5.5 How the recommended option aligns to our consumer and stakeholder engagement

The sum total of our proposed forecast network asset replacement and renewal expenditure, of which this recommended option is a component of, aims to achieve outcomes that were directly supported by our customers, as ultimately reflected in the recommendations of the People's Panel. This is noting that:

- the topic of service reliability and safety has been a key focus of our consumer and stakeholder engagement program. One of the four key themes that have framed our engagement under a desire to 'focus on what matters' to our customers has been the theme of 'a reliable, resilient, and safe electricity network';
- in engaging on this theme, and under the specific topic of 'reliability and bushfire safety' we undertook a series of deep-dive workshops called 'Focused Conversations' with a broad range of consumer, industry, and government and regulatory body representatives. In these Focused Conversations we sought recommendations on the service outcomes that customers prefer and expect;[8]
- while the specific circumstances of the Hindley Street substation were not directly discussed, we engaged in a more aggregate way across all of our potential network asset replacement, by engaging on service outcomes for customers in relation to managing reliability and safety through network asset replacement. We engaged on the overall identified need for repex by outlining:
    1. information on what impacts on the safety and reliability of our network and how these drivers have been evolving over time and how this can be managed through either asset replacement or asset upgrades;
    2. our service outcomes and expenditure performance over time in asset replacement;
    3. information on the ageing and deteriorating condition of our network assets;
    4. our approach to forecasting service performance risks for customers; and
    5. our assessment of current risk versus forecast risk for service performance outcomes to customers;
- in the focused conversations we then posed three scenarios of how we could respond to the needs, and expected outcomes for customers in relation to service, expenditure and price, these included:

[8] This was covered in workshops (1) scene setting / rationale – providing stakeholders with an overview of the factors impacting service outcomes including ageing assets, (2) delivering service outcomes through asset replacement – providing stakeholders with an understanding of the challenges and drivers associated with managing ageing infrastructure and wha this means for customers in terms of service levels) , (4) optimising asset investment – summary of focused conversations outcomes and discuss proposed investment levels) for the 'Reliability and bushfire safety' Focused Conversation. Materials presented at the Focused Conversations are available on our TalkingPower website under the page titled 'focused conversations'. [https://www.talkingpower.com.au].

1. 'Basic' – which was a base-case counterfactual of Business-As-Usual, whereby we do nothing materially different and maintain to our current level replacement expenditure, showing the decline in service performance outcomes for customers (in dollar terms) arising from forecast asset failures
2. 'maintain' – a scenario in which we undertake expenditure to maintain the current level of reliability and safety in the network in aggregate
3. 'new value' – a scenario in which we undertake expenditure to maintain the current level of reliability and safety in the network by geographic region

- as the focused conversations progressed, these three scenarios evolved, as we sought to integrate choices for customers on outcomes through network upgrades and network replacements;
- while our customers and stakeholders were consistently mindful of energy affordability concerns, the Focused Conversations arrived at a clear consensus recommendation to the People's Panel, as the next stage in our engagement program, that we should invest sufficiently in network asset replacement in order to achieve the following:

6. maintain reliability by geographic region – highlighting the importance of considering equity between regions and customers when investing in the reliability of the network;
7. improve reliability / arrest decline in reliability of the Adelaide CBD in order to achieve compliance with the jurisdictional service standard target – given the importance of complying with standards and the importance of the Adelaide CBD to the economic prosperity of South Australia and to customers in this region; and
8. to maintain safety in aggregate across our network – given the desire of our customers to not see rising risks of harm and damage increasing;[9]

- ultimately, the People's Panel deliberated on and affirmed the results of the Focused Conversations in their formal recommendation, and we have committed to taking this recommendation forward as reflected in the overall recommendation reflected in this justification document for forecast asset replacement and renewal expenditure.

6 Deliverability of recommended option

We have developed a plan to ensure that we can deliver the recommended project in this business case together among all of the increased volume of work reflected in the programs that comprise our total network expenditure forecast in our Regulatory Proposal. This plan considers the detailed implications of our proposed overall uplift in total network expenditure for our required workforce and supporting internal services of information technology, fleet, property and human resources.

We consider that our plan is realistic and achievable over the 2025-30 RCP. The details of our approach are set out in our accompanying document, *'5.2.5: Resourcing Plan for Delivering the Network Program'*.

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[9] The recommendations of the Focused Conversation are contained in documents published on our TalkingPower website under the page titled 'focused conversations'. SAPN, *final outputs and recommendations to the People's Panel for Reliability and Bushfire Safety*, October, 2023. Accessible on: [https://www.talkingpower.com.au].