Draft Decision

SA Power Networks Electricity Distribution Determination 2025 to 2030

(1 July 2025 to 30 June 2030)

Attachment 5
Capital Expenditure

September 2024

AUSTRALIAN ENERGY REGULATOR

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Capital expenditure (capex) refers to the money required to build, maintain or improve the physical assets needed to provide standard control services (SCS).[1] Generally, these assets have long lives and a distributor will recover capex from customers over several regulatory control periods. A distributor's capex forecast contributes to the return of and return on capital building blocks that form part of its total revenue requirement.

Under the regulatory framework, a distributor must include a total forecast capex that it considers is required to meet or manage expected demand, comply with all applicable regulatory obligations, to maintain the safety, reliability, quality, and security of its network and contribute to achieving emissions reduction targets for reducing Australia's greenhouse gas emissions (the capex objectives).[2]

We must decide whether or not we are satisfied that this forecast reasonably reflects prudent and efficient costs and a realistic expectation of future demand, cost inputs, and other relevant inputs (the capex criteria).[3] We must make our decision in a manner that will, or is likely to, deliver efficient outcomes in terms of price, quality, safety, reliability and security of supply and contribute to achieving targets for reducing Australia's greenhouse gas emissions for the benefit of consumers in the long term (as required under the National Electricity Objective (NEO)).[4]

The *AER capital expenditure assessment outline* explains our and distributors' obligations under the National Electricity Law and Rules (NEL and NER) in more detail.[5] It also describes the techniques we use to assess a distributor's capex proposal against the capex criteria and objectives. Where relevant we also assess capex associated with emissions reduction proposals taking into account our *Guidance on amended National Electricity Objectives*.[6]

Total capex framework

We analyse and assess capex drivers, programs and projects to inform our view on a total capex forecast. However, we do not determine forecasts for individual capex drivers or determine which programs or projects a distributor should or should not undertake. This is consistent with our *ex-ante* incentive-based regulatory framework.

Once the *ex-ante* capex forecast is established, there is an incentive for distributors to provide services at the lowest possible cost, because the actual costs of providing services will determine their returns in the short term. If distributors reduce their costs, the savings are shared with consumers in future regulatory control periods. Our assessment of the ex-ante capex is consistent with the NEO, which in addition to providing for the lowest possible costs also recognises that services should be valued appropriately and adapt to changing circumstances to maintain efficiencies in the long term interest of consumers. This incentive-

1 These are services that form the basic charge for use of the distribution system.

2 NER, cl. 6.5.7(a).

3 NER, cl. 6.5.7(c).

4 NEL, ss. 7, 16(1)(a).

5 AER, *Capex assessment outline for electricity distribution determinations*, February 2020.

6 AER, Guidance on amended National Electricity Objectives, September 2023.

based framework provides distributors with the flexibility to prioritise their capex program given their circumstances and due to changes in information and technology.

Distributors may need to undertake programs or projects that they did not anticipate during the reset. Distributors also may not need to complete some of the programs or projects proposed if circumstances change, these are decisions for the distributor to make. We consider a prudent and efficient distributor would consider the changing environment throughout the regulatory control period and make decisions accordingly.

Importantly, our decision on total capex does not limit a distributor's actual spending. We set the forecast at a level where the distributor has a reasonable opportunity to recover its efficient costs.

Assessment approach

We provide guidance on our assessment approach in several documents, including the following which are of relevance to this decision:

- AER's *Expenditure Forecast Assessment Guidelines*[7]
- Regulatory Investment Test for Distribution and Transmission (RIT-D and RIT-T) Guidelines[8]
- AER's *Asset Replacement Industry Note*[9]
- AER's *Information and Communication Technologies (ICT) Guidance Note*[10]
- AER's *Guidance on amended National Electricity Objectives.*[11]

We also had regard to the guiding principles in the AER's *Better Resets Handbook – Towards consumer centric network proposals* which encourages networks to develop high quality, well-justified proposals that genuinely reflect consumers' preferences.[12]

Our final decision has been based on the information before us, which includes:

- the distributor's regulatory proposal and accompanying documents and models
- the distributor's responses to our information requests
- stakeholder comments in response to our Issues Paper.
- technical review and advice from our consultant's reports.

In this instance we sought technical review and advice from Energy Market Consulting Associates (EMCa). We engaged EMCa in March 2024 to assist us in reviewing certain aspects of the capex proposal, including replacement, augmentation and information and communication technology expenditure.

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7 AER, *Expenditure Forecast Assessment Guideline 2013*, August 2022.

8 AER, *RIT-T and RIT-D application guidelines (minor amendments) 2017*, September 2017.

9 AER, *Industry practice application note for asset replacement planning*, January 2019.

10 AER, *AER publishes guidance on non-network ICT capital expenditure assessment approach*, November 2019.

11 AER, Guidance on amended National Electricity Objectives, September 2023.

12 AER, *Better Resets Handbook – Towards consumer-centric network proposals*, December 2021.

5.1 Draft decision

Our draft decision is to not accept SA Power Networks' proposed total forecast capex of $2,379.1 million ($2024–25) because we are not satisfied that it reasonably reflects the capex criteria (in particular, we are not satisfied that it reasonable reflects the prudent and efficient costs, and a realistic expectation of demand and cost inputs required, to meet the capex objectives). Our substitute forecast is $2,135.2 million, which is 10.3% below SA Power Networks' forecast.

We consider this forecast will provide for a prudent and efficient service provider in SA Power Networks' circumstances to meet the capex objectives. **Table 5.1** outlines our substitute estimate of forecast capex and compares this to SA Power Networks' proposed forecast capex.

Table 5.1 AER's draft decision on SA Power Networks' total net capex forecast ($ million, $2024–25)

	2025–26	2026–27	2027–28	2028–29	2029–30	Total
SA Power Networks' proposal	465.0	479.5	486.8	469.4	478.5	2,379.1
AER's draft decision	423.9	440.2	435.5	408.5	427.1	2,135.2
Difference ($)	-41.1	-39.3	-51.3	-60.9	-51.4	-243.9
Difference (%)	-8.8%	-8.2%	-10.5%	-13.0%	-10.7%	-10.3%

Source: AER analysis and SA Power Networks' proposal.

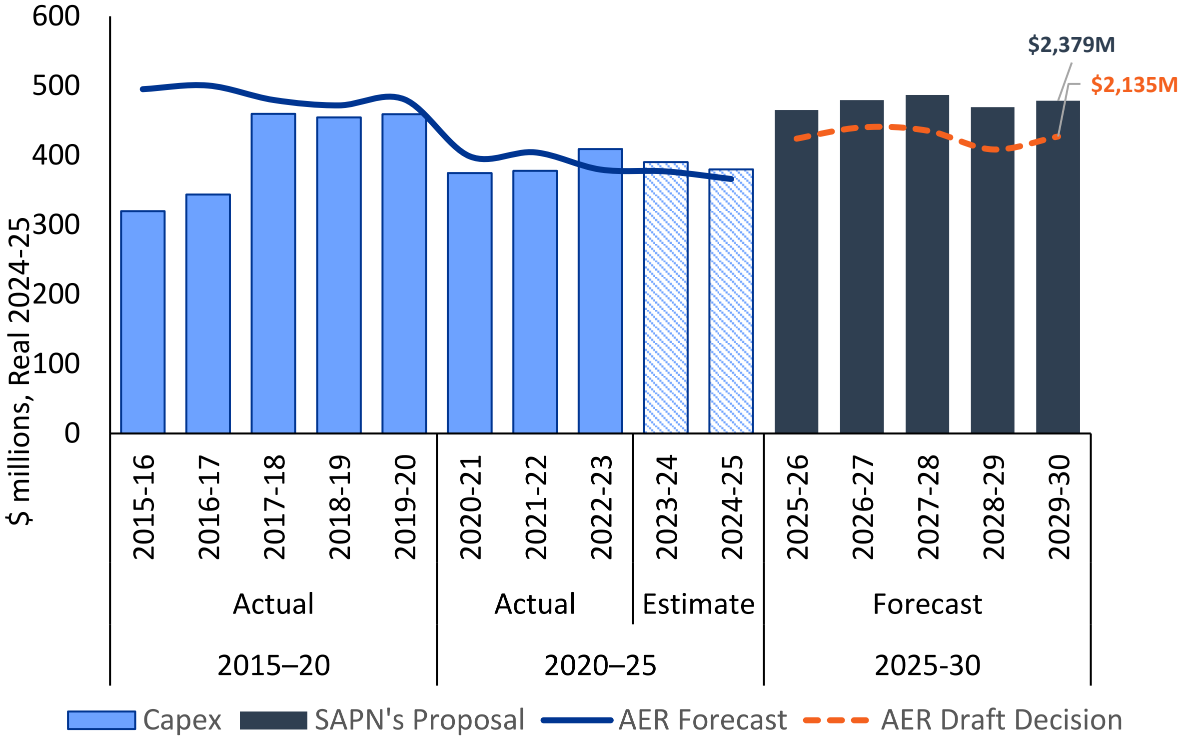
Note: Numbers may not add up due to rounding. Modelling adjustments relate to updates to the consumer price index (CPI) and real cost escalation assumptions.

5.2 SA Power Networks' proposal

SA Power Networks' proposal forecasts $2,379.1 million ($2024–25) capex over the 2025–30 regulatory control period. This represents an increase of approximately 22% compared to actual and expected expenditure over the 2020–25 period.

Figure 5.1 outlines SA Power Networks' historical capex trend, its proposed forecast for the 2025–30 regulatory control period, and our draft decision.

Figure 5.1 SA Power Networks' historical and forecast capex ($ million, $2024–25)



Source: AER RIN Database, AER Analysis.
Note: Nominal figures converted to real dollars 2024–2025.

Within the current regulatory period (2020–25), SA Power Networks expects to underspend by $14.4 million or 0.7% of the AER forecast.[13] SA Power Networks' capex for the 2020–25 period was impacted by lower economic activity and a higher rate of return, decisions by ElectraNet resulting in lower than expected connection point upgrades, and general delays in field work due to Covid restrictions in the first two years of the period.

SA Power Networks states that during the 2020–25 period, it continued to rebalance and re-prioritise how it manages its distribution network in response to increasing challenges in the operating environment.[14] This included increased replacement expenditure (repex) above forecast to manage risks, the deployment of feeder automation to reduce the number of supply interruptions, investments in transitioning to a 'two-way' distribution network, and major changes to ICT infrastructure including a new billing system and upgrading its Enterprise Resource Planning systems.

SA Power Networks considers that the declining depreciation, as some assets reach the end of their economic life, signals an opportunity for network investment given its aging network and expanding customer network service expectations.[15] SA Power Networks is proposing to increase its:

- replacement expenditure by 28.8% ($909.4 million or 31.2% of its total forecast capex) to manage and maintain its ageing network, which it considers necessary to meet its reliability and safety obligations

13 SA Power Networks, *Attachment 5: Capital Expenditure Policy 2025–30*, January 2024, p. 12.
14 SA Power Networks, *Attachment 5: Capital Expenditure Policy 2025–30*, January 2024, p. 13.
15 SA Power Network, *2025–30 Regulatory Proposal Overview*, January 2024, p. 15.

- augmentation expenditure by 44.2% ($505.5 million or 17.3% of its total forecast capex) to accommodate increasing growth for its services, including business and residential growth, electrification, and customer expectations (such as bushfire management, safety and reliability including worst served customers).

Table 5.2 provides a breakdown of SA Power Networks' capex proposal in more detail.

Table 5.2 SA Power Networks' forecast capex categories verses current period actual/estimates ($ million 2024–25)

Category	SA Power Networks' 2020–25 capex	SA Power Networks' 2025–30 capex	Change from 2020–25 (%)	Proportion of total capex
Replacement	706	909.4	28.8%	31.2%
Connections	704	745.2	5.9%	25.6%
Augmentation	350.5	505.5	44.2%	17.3%
ICT	366.2	300.8	-17.9%	10.3%
Fleet	113.7	154.9	36.2%	5.3%
Property	73.3	115.8	58.0%	4.0%
CER	41	90.7	121.2%	3.1%
Non-network capex - other	29.8	50.4	69.1%	1.7%
Capitalised overheads	27.5	42.8	55.6%	1.5%
Gross Total	**2412.0**	**2915.5**	**20.9%**	**100%**
Customer contribution connections	-435.5	-514.5	18.1%	
Disposals	-24.6	-21.8	-11.4%	
Net Total	**1,951.9**	**2,379.2**	**21.9%**	

Source: AER analysis.

Note: Numbers may not add up to total due to rounding.

5.3 Reasons for draft decision

We reviewed SA Power Networks' capex drivers, programs and projects to inform our view on a total capex forecast that reasonably reflects the capex criteria. We conducted top-down analysis such as examining trends and forecast costs compared with historical capex, and inter-relationships between cost categories. To complement this, we conducted bottom-up analysis of SA Power Networks specific major programs and projects.

Our capex assessment focused primarily on the material capex categories that either represented a significant uplift in expenditure, had stakeholder interest or are new and evolving areas such as CER and the innovation fund. Capex that was relatively small and forecast using established modelling approaches and inputs in line with our expectations, meant that we did not need to undertake a more detailed analysis of the individual programs and projects. An example of this was SA Power Networks' capitalised overheads forecast. Our draft decision is reflective of this approach as set out in Table 5.4 and Table 5.5 below.

Further, in considering the scope of our review we had regard to how SA Power Networks' has performed against the Better Resets Handbook expectations for capex.[16]

Our assessment against each expectation is set out in **Table 5.3**.

Table 5.3 Better Resets Handbook capex expectations

Capital expenditure expectations	AER Position
Top-down testing of the total capex forecast and at the category level.	SA Power Networks has not met this expectation as the total forecast capex is 22% above current period actual/estimate spend. There is a material increase above current expenditure for most of SA Power Networks' capex categories, with the exception of connections (5.9% increase) and ICT (17.9% decrease) as set out in table 5.2 above. SA Power Networks has also applied the AER's repex model but given this has low coverage at 33% of total repex, we do not consider this to be a formative top down test of SA Power Networks' capex.
Evidence of prudent and efficient decision-making on key projects and programs.	SA Power Networks has made improvements in its modelling and forecasting for several key projects and programs in the business as usual areas. SA Power Networks has broadly met this expectation. However there is insufficient data provided and a clear justification to demonstrate how it is making prudent investment decisions for some of the proposed replacement and augmentation expenditure.
Evidence of alignment with asset and risk management standards.	SA Power Networks has met this expectation. SA Power Networks provided detailed information on its planning and asset management practices which is largely consistent with good industry practices. Key asset management documents outline the processes and approach to quantitative cost-benefit analysis. SA Power Networks has a quality management system certified to ISO 9001:2015 and have aimed to align the Asset Management Framework with ISO 55000:2014.
Genuine consumer engagement on capital expenditure proposals.	SA Power Networks has met this expectation. SA Power Networks have undertaken an extensive customer engagement in preparation of its proposal. Stakeholder submissions indicated that overall, the consumer engagement was conducted well and the documentation provided has made it clear what customer expectations are on desired service outcomes. This has been considered in a number of capex proposals, including reliability augmentation and CER.

16 AER, *Better Resets Handbook – Towards Consumer Centric Network*, December 2021, pp. 19–23.

While we have not accepted SA Power Networks' total capex forecast, we are broadly supportive of SA Power Networks' forecasting approach and consider that SA Power Networks has largely provided us with good quality information and supporting evidence that demonstrates the prudency and efficiency of its expenditure in most areas of capex. This has resulted in us accepting a number of significant investment programs, including ICT and enhanced cyber security expenditure. In these cases, SA Power Networks appropriately identified the risks and options, provided robust analysis considering the timing and delivery of projects, together with reasonable cost estimates.

However, we have identified a number of key components of SA Power Networks' forecast that are not prudently required to maintain the safety, reliability or security of the network and contribute to achieving emissions reduction targets, or reflect the efficient costs of doing so. These are SA Power Networks' proposed replacement, augmentation, Adelaide CBD reliability program and innovation fund expenditures.

Replacement expenditure is required to maintain the safety, security and reliability of the network. We observed that SA Power Networks' overall reliability performance (with the exception of the Adelaide CBD) has been improving and it is meeting its jurisdictional reliability standards.

We recognise the increasing age of SA Power Networks distribution network but consider the risks and resulting expenditure to be overstated and we have determined a substitute repex which is 15% less than what SA Power Networks' proposed. This is 9% above SA Power Networks actual/estimated repex for the current 2020–25 period, reflecting a more modest uplift compared to what was proposed by SA Power Networks.

Augmentation expenditure (augex) supports the network to address changes in demand and network utilisation. We have accepted a majority of SA Power Networks' proposed augex, including expenditure for worst serviced customers, managing bushfire risks and resilience. We have developed an alternative forecast, as some demand-driven augmentation projects can be prudently deferred, and network performance does not justify the level of increase in reliability augex that SA Power Networks proposed

We consider SA Power Networks should be seeking to utilise all options to get the most out of what is available from its existing network before proceeding to building more. We have adopted the demand forecast proposed by SA Power Networks subject to SA Power Networks addressing our concerns regarding duplication between the trend and specific loads, as well as updating the forecast for more recent data.

We acknowledge that SA Power Networks needs to improve the reliability in the Adelaide CBD and a program of works is necessary. However, we consider SA Power Networks' proposed program did not consider all viable options from a system wide planning perspective, including a more effective configuration of the network in the CBD.

Our draft decision is to include a placeholder alternative forecast expenditure of $12.2 million based on historical expenditure given the absence of information and the need to undertake further work. This is 87% less than SA Power Networks' proposed $90.7 million, however, the assessment is on-going and we expect this component of SA Power Networks' expenditure proposal be revised for the final decision.

We recognise the importance of innovation investment in supporting the energy transition. SA Power Networks proposed $20 million in innovation ($16 million in capex and $4 million in opex). We consider that SA Power Networks needs to do further work on its innovation plans with its customers. We found that there was no firm plan, with a continuously evolving scope and related costs.

As a placeholder, we have not included SA Power Networks' proposed innovation funding in our draft decision. We expect SA Power Networks to provide further information in its revised proposal, including a firm list of projects, scope of works, costs, options and expected benefits that clearly demonstrate the transformative nature of the investment. Similar to the CBD reliability program, we expect this component of SA Power Networks' expenditure proposal to be revised for the final decision.

Table 5.4 sets out our draft decision for SA Power Networks' by capex category.

Table 5.4 AER draft decision by capex category ($ million 2024–25)

Category	SA Power Networks' proposal	AER draft decision	Difference ($/%)		Difference over total capex (%)
Replacement	909.4	772.6	-136.8	-15.0%	-5.7%
Connections	745.2	745.2	-	0.0%	0.0%
Augmentation	505.5	423.5	-82.0	-16.2%	-3.4%
ICT	300.8	300.8	-	0.0%	0.0%
Fleet	154.9	140.7	-14.2	-9.2%	-0.6%
Property	115.8	115.8	-	0.0%	0.0%
CER	90.7	90.7	-	0.0%	0.0%
Non-network capex - other	50.4	34.4	-16.0	-31.8%	-0.7%
Capitalised overheads	42.7	38.7	-4.0	-9.4%	-0.2%
Gross Total	**2,915.5**	**2,662.5**	**-253.0**		
Less customer contributions	514.5	514.5	-	0.0%	0.0%
Less Disposals	21.8	21.8	-	0.0%	0.0%
Modelling adjustments		9.0	9.0		0.4%
Net Total	**2,379.1**	**2,135.2**	**-243.9**		**-10.3%**

Source: SA Power Networks' capex model and AER analysis.

Note: Numbers may not sum due to rounding. Modelling adjustments relate to updates to the consumer price index (CPI) and real cost escalation assumptions.

Table 5.5 summarises our views on each of the capex categories and whether they are prudent and efficient and reflect the capex criteria, and the reasons for this. Further detail and reasons on capex for the draft decision are contained in Appendices A.1 to A.5.

Our findings on each capex driver are part of our broader analysis and should not be considered in isolation. We do not approve an amount of forecast expenditure for each individual capex driver or project/program. However, we use our findings on the different capex drivers to assess a regulated business' proposal as a whole and arrive at a substitute estimate for total capex where necessary. Our decision on total capex does not limit a regulated business' actual spending.

Table 5.5 Summary of findings and reasons, by capex category

Issue	Findings and reasons
Replacement	We have not included all of SA Power Networks' replacement expenditure in the total forecast capex. SA Power Networks' proposed $909.4 million ($2024–25) for replacement capex. Our draft decision is to include $772.6 million for replacement capex. This is $136.8 million or 15% less than what SA Power Networks proposed. Our reasons for this are set out in Appendix A.1.(Replacement)
Connections	We have included SA Power Networks' connections forecast in the total forecast capex. SA Power Networks' proposed gross connections expenditure of $745.2 million ($2024–25) (5.9% higher than the current period) and $255.2 million ($2024–25) in net connections capex. The difference of $490.1 million is due customer connection contributions, which is 12.5% higher than the current period as a result of an expected stronger financial environment. Forecast net connections expenditure will decrease by 5% relative to the current period due to the higher customer contributions. SA Power Networks' forecast increase in overall connection works is driven by economic recovery and strong growth, particularly in major customer and embedded generation connections.[17] SA Power Networks' modelling and forecasting approach for each of the connection categories (minor, medium, major, real estate developments) is consistent with our previous distribution determinations. SA Power Networks has introduced a new large embedded generation connections category for increasing demand and complexity for CER connection services and large load connections, such as firm and flexible load/export combinations, which we consider reasonable. For each of the five categories of connections, SA Power Networks calculated the proportion of the customer contribution to the connection costs on the basis of its Connection Policy 2025-30[18] having regard to: • recent historical contribution levels • independently forecast connection services activity across each category • applying the incremental rebate formula consistent with SA Power Networks' Connection Policy. Forecast customer contributions for each connection category were estimated by applying the Incremental Revenue Rebate, with regard to recent historical contribution levels, to the gross connections forecast • determining net expenditure (gross expenditure minus customer contributions). We consider this approach to be reasonable and is consistent with SA Power Networks' approach for the 2020–25 period.
Augmentation	We have not included all of SA Power Networks augmentation expenditure in the total forecast capex. SA Power Networks proposed $505.5 million ($2024–25) for augmentation capex. Our draft decision is to include $423.5 million for augmentation capex. This is $82 million or 16.2% less than what SA Power Networks proposed. Our reasons for this are set out in Appendix A.2 (Augmentation, including the Demand Forecast).

17 SA Power Networks, *Attachment 5 – Capital expenditure* – January 2024, p. 56.

18 SA Power Networks, *Attachment 17 – Connection Policy 2025–30* – January 2024.

<table>
<tr><th>Issue</th><th>Findings and reasons</th></tr>
<tr><td>ICT</td><td>We have included SA Power Networks’ proposed ICT forecast in the total forecast capex.

SA Power Networks has proposed $300.8 million in ICT capex for the next period, with $165.3 million attributed to recurrent ICT and the balance of $135.5 million to non-recurrent capex.

SA Power Networks’ proposed ICT expenditure is largely in line with actual or estimated expenditure for the current period. This included a small component related to cybersecurity ($6.4 million); with a majority being opex ($64 million).

We consider that the ICT proposal has clearly articulated a program that is prudent and efficient and aligns with our ICT Guideline.[19] We found that SA Power Networks’ approach to forecasting recurrent ICT to be reasonable and SA Power Networks provided sufficient evidence demonstrating that the non-recurrent ICT expenditure, including cyber security, was required.

Our reasons for this are set out in Appendix A.4 (ICT).</td></tr>
<tr><td>Fleet</td><td>We have not included all of SA Power Networks’ proposed fleet forecast in the total forecast capex. We have applied a modelling adjustment to the fleet forecast to reflect the lower network expenditure in line with our draft decision because SA Power Networks’ fleet forecast is dependent on the level of replacement and augmentation expenditure.

Our draft decision is to include $140.7 ($2024–25) in fleet expenditure.

SA Power Networks proposed $154.9 million ($2024–25) for its fleet forecast. SA Power Networks’ fleet is forecast to increase by 36.2% from the current period due to the:
• timing of standard and unchanged vehicle replacement cycles (base forecast of $128.8 million)
• need to increase fleet volume to support a forecast increase in network capital growth (trend escalation of $23.2 million)
• opportunity to acquire Electric Vehicles (EVs) where it is efficient (step change of $2.9 million).

We accept SA Power Networks’ forecasting approach for its fleet capex is reasonable because:
• SA Power Networks has used asset replacement cycles consistent with the 2020–25 Final Determination and which we consider are comparable with other Australian energy network businesses. While for most vehicle asset classes, the 2025–30 forecast remains similar to the 2020–25 period, the cyclical nature of fleet replacements mean some variations in volumes will occur when comparing one regulatory period to another. SA Power Networks’ forecast base expenditure for 2025–30 ($108.5 million ($2022–23))[20] remains reasonably consistent to the fleet expenditure forecast approved for the 2020–25 period ($97.3 million ($2019–20))[21]
• the network uplift trend reflects increased fleet unit costs during 2020–25.

SA Power Networks’ EV options analysis considered suitability as well as the total cost of ownership taking into account expected purchase and operating costs, along with the projected residual value at the end of the vehicle's life. An approach based on cost-effectiveness and suitability is consistent with good investment decision making. We also consider that SA Power Networks’ modelling inputs, including vehicle costs and vehicle life, to be reasonable. SA Power Networks’ EV options analysis did not include the benefits of any emissions reduction.</td></tr>
</table>

19 AER, *Guidance Note – Non-network ICT capex assessment approach for electricity distributors*, 28 November 2019.

20 SA Power Networks, *Attachment 5.10.1: Business case: Fleet 2025–30 Regulatory Proposal* – January 2024, p. 12.

21 SA Power Networks, *Attachment 5.10.1: Business case: Fleet 2025–30 Regulatory Proposal* – January 2024, pp. 13–14 and AER, *Final Decision, SA Power Networks Distribution Determination 2020 to 2025 – Attachment 5 Capital expenditure*, June 2020, p. 51.

Issue	Findings and reasons
Property	We have included SA Power Networks' proposed property forecast in the total forecast capex. SA Power Networks proposed $115.8 million ($2024–25) for its property forecast comprising recurrent replacements and refurbishments, and depot renewals ($61.7 million to maintain functions, capability and services) as well as new depots and a workshop – Mount Barker depot ($16.9 million), Port Augusta depot ($10.1 million) and the transformer workshop ($27.1 million). SA Power Networks' property forecast is to increase by 58% compared to the current period reflecting a change to property asset lifecycle management and the deteriorating condition and capacity limitations of its properties. We consider SA Power Networks' forecasting approach for its property forecast is reasonable because: • during the 2020–25 period, SA Power Networks improved its approach to property asset lifecycle management, resulting in more accurate risk visibility, reflected in actual/estimated property expenditure • SA Power Networks' option analysis for the Mount Baker and Port Augusta depots, and transformer workshop have positive net present values. Further, SA Power Networks' Multi Criteria Analysis used for unquantifiable (qualitative non-market price) benefits supported its preferred options • SA Power Networks obtained cost estimates for all projects in the recurrent property expenditure program from independent sources. Key rates included costing data for previous refurbishments as well as recent costing data for the new Seaford depot during the 2020–25 period • SA Power Networks have existing building panel arrangements in place with several construction vendors in the market to provide resources or skills as required to deliver the program over the 2025–30 period.
CER	We have included SA power Networks' proposed CER forecast in the total forecast capex. SA Power Networks proposed CER expenditure of $90.7 million ($2024–25) that included a range of programs including integration, compliance, network visibility and demand flexibility. We recognise that SA Power Networks' customer engagement revealed strong support for it maintaining a high level of export service, on the condition that the costs of these investments would be recovered from export customers only, via export tariffs. We consider that the proposed CER expenditure will provide net benefits to customers. Our reasons for this are set out in Appendix A.5 (CER).
Other non-network capex, including the innovation fund	As a placeholder, we have not included SA Power Networks' other non-network capex forecast in the total forecast capex. SA Power Networks proposed $50.4 million ($2024–25) in other non-network expenditure which included $16 million in innovation funding. Our draft decision is to include $34.4 million for other non-network capex. This is $16 million or 32% less than what SA Power Networks proposed because we have not included the proposed innovation fund expenditure. Our reasons for this are set out in Appendix A.3 (Innovation Fund)

Issue	Findings and reasons
Capitalised overheads	We have included $38.7 million of SA Power Networks' capitalised overheads in the total forecast capex. This is $4 million (or 9.4%) less than the $42.7 million ($2024–25) in capitalised overheads proposed by SA Power Networks. This is because capitalised overheads are an allocated portion of total forecast capex, requiring a modelling adjustment based on our alternative forecast of total capex. The adjustment to capitalised overheads reflects this impact for the capex categories for which overheads have been allocated. We consider SA Power Networks' forecast capitalised overheads is reasonable because: • the forecast is based on the historically observed ratio of network overheads to direct costs of network projects experienced in 2020–25 • the underspend of its capitalised overheads in the 2020–25 period reflects improvements to its internal cost attribution for capex projects • the forecast increase in capitalised overheads is largely consistent with the proposed uplift in the proposed capex categories that include capitalised overheads • the forecast aligns with our expectations given the proposed capex expenditure program.
Customer contributions	We have included SA Power Networks' customer contribution forecast in the total forecast capex. SA Power Networks proposed $514.5 million in customer connection and augmentation contributions. The customer connections are based on the established connections policy and aligns with proposed connections expenditure and for this reason we consider the forecast is reasonable.
Disposals	We have included SA Power Networks' asset disposal forecast in the total forecast capex.
Ex post review	We are required to provide a statement on whether the roll forward of the regulatory asset base (RAB) from the previous period contributes to the achievement of the capex incentive objective. The capex incentive objective is to ensure that, where the RAB is subject to adjustment in accordance with the NER, only expenditure that reasonably reflects the capex criteria is included in any increase in value of the RAB. We may exclude capex from being rolled into the RAB when a distributor has overspent the amount of capex above the forecast that does not reasonably reflect the capital expenditure criteria.[22] We have reviewed SA Power Networks' capex performance for the 2018–19 to 2022–23 regulatory years. SA Power Networks incurred total capex below its regulatory forecast for the ex-post review period. On this basis, the overspending requirement for an efficiency review of past capex is not satisfied. We are satisfied that including this actual capex in the RAB is likely to contribute towards achieving the capex incentive objective.

[22] AER, *Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, July 2024, p. 16.

A Reasons for decision on key capex categories

This appendix sets out our assessment of key capex categories and programs/projects within SA Power Networks' total revised capex forecast and the reasons for our decision. This appendix includes:

- replacement expenditure (including the CBD reliability program) (A.1)
- augmentation expenditure (A.2)
- innovation fund (A.3)
- information and communication technology (A.4)
- consumer energy resources (A.5).

A.1 Replacement expenditure

Replacement expenditure or repex must be set at a level that allows a distributor to meet the capex criteria. Replacement can occur for a variety of reasons, including when:

- an asset fails while in service or presents a real risk of imminent failure
- a condition assessment determines that it is likely to fail soon or degrade in performance, such that it does not meet its service requirement and replacement is the most economic option[23]
- the asset does not meet the relevant jurisdictional safety regulations and can no longer be safely operated on the network
- the risk of using the asset exceeds the benefit of continuing to operate it on the network.

The majority of network assets will remain in efficient use for far longer than a single five-year regulatory control period (many network assets have economic lives of 50 years or more). As a result, a distributor will only need to replace a portion of its network assets in each regulatory control period.

A.1.1 AER's draft decision

We are not satisfied that SA Power Networks' proposed $909.4 million ($2024–25) for replacement capital expenditure (repex) reflects the capex criteria.[24] Our decision is to include $772.6 million for repex in our alternative capex estimate. This is $136.8 million or 15% less than what SA Power Networks proposed. Our alternative estimate does not include uplifts in all repex asset categories because SA Power Networks has not demonstrated that all the proposed uplift above the current level of expenditure is required. Our draft decision repex forecast is 9.4% above SA Power Networks actual/estimate repex for the 2020–25

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23 A condition assessment may relate to assessment of a single asset or a population of similar assets. High-value/low-volume assets are more likely to be monitored on an individual basis, while low value/high volume assets are more likely to be considered from an asset category wide perspective.

24 NER, cl.6.5.7(c).

period, reflecting a more modest uplift compared to what was proposed by SA Power Networks.

A.1.2 SA Power Networks' proposal

SA Power Networks has proposed $909.4 million ($2024–25) in repex.[25] This is an increase of 28.8% over the actual/estimated repex in the current period. Repex represents 31.2% of the total capex proposed.

SA Power Networks submits that its repex expenditure is primarily guided by a response to the risks posed to network services and performance. SA Power Networks stated that:

- the underlying driver for the proposal is that network assets are aging to a point of noticeable deterioration of condition
- this deterioration will drive an increase in asset failures; and
- this will have a flow-on effect to service performance with an increasing risk to reliability and safety.[26]

SA Power Networks engaged with consumers during the development of its regulatory proposal on the identified drivers for its repex. It has put forward repex required to:[27]

- respond to customers' concerns, identified through its consumer and stakeholder engagement process, regarding customer service level recommendations, particularly around equity between regions and customers
- comply with regulatory obligations, with a specific focus on meeting jurisdictional feeder category targets for the Adelaide CBD
- maintain reliability for the entire SA network by geographic region
- maintain safety in relation to the risks of harm to workers, consumers and the community.

SA Power Networks considers that to meet the needs outlined above it will have to increase replacement rates above current levels to maintain service levels.

The repex proposal comprises of conductors, underground cables, poles, pole top structures and individual programs to maintain and improve reliability in the CBD and to maintain safety throughout the network.

SA Power Networks used three approaches to forecasting its proposed repex:

- a risk-cost model that quantifies the level of service risk into monetary values. This covers 67% of the proposed repex[28]

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25 This number include a repex efficiency adjustment of $27.1 million that SA Power Networks has put forward if an ICT program is accepted (see section A4). Before the efficiency adjustment, the proposed repex is $936.4 million.

26 SA Power Networks, *5.3.1 – Network asset replacement expenditure* – January 2024, p. 20.

27 SA Power Networks, *5.3.1 – Network asset replacement expenditure* – January 2024, p. 21.

28 This covers: poles, underground cables, conductors, switching cubicles, distribution transformers, reclosers, service lines, power transformers, circuit breakers (excluding Hindley Street and Northfield substations) and protection relays.

- the use of historic expenditure for asset categories, where not enough data or data quality concerns exist for the risk-cost model. This covers 28% of the proposed repex[29]
- independent business cases for specific programs of work that are not business-as-usual. This includes the CBD reliability program, the Hindley Street substation replacement and the Northfield substation replacement. This covers 5% of the proposed repex.[30]

A.1.3 Reasons for decision

Our assessment approach for this category uses a combination of a top-down and bottom-up approach. We use the repex model[31] to guide us in pinpointing areas for a more comprehensive bottom-up evaluation. Our review examined SA Power Networks':

- use of the risk-cost model with a key focus on the high voltage (HV) conductor, underground cables and CBD cables replacement programs
- reliability performance and historic expenditure to maintain reliability and safety of the network services required under the NER; and
- the independent business case drivers and costs.

We engaged engineering consultants EMCa to review SA Power Networks' proposed repex. EMCa reviewed 2 key component drivers of SA Power Networks' repex: the conductor replacement program and the underground cable expenditure (non-CBD), with a focus on the risk-cost model, as well as reviewing the underlying need for the uplift in these programs.

Submissions to the Issues Paper support the proposed repex's focus on maintaining reliability. The District Council of Streaky Bay, Adelaide Hills Council and SA Power Networks' Regional and Remote Customers sub-committee all support maintaining reliability at the geographical level. However, stakeholders are also cognisant of the significant uplift in expenditure and query whether all of it is required.[32]

Our main concern is with the elements of the forecast that rely on risk-cost model because we consider a number of the inputs and assumptions used in the model overstate the risk, and the cost, and as a result, the extent of the need to replace assets. We also consider there is an alternative option that needs to be explored for the Adelaide CBD reliability program (discussed in section A.1.3.3 below).

We have accepted the two individual replacement projects for the Northfield[33] and Hindley Street[34] substations. SA Power Networks has provided detailed cost estimates for both projects in response to information requests[35] and we consider the need has been established and the costs outlined in these estimates are reasonable.

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29 This covers: pole top structures, powerlines other, substation other, telecommunications and mobile plant.

30 This covers: the Hindley Street substation and Northfield gas insulated substation (GIS).

31 AER's repex model is a top-down assessment tool to provide a high level understanding of how a DNSP performs compared to other DNSPs on replacement capital expenditure.

32 Department for Energy and Mining, *Submission - 2025-30 Electricity Determination - SA Power Networks*, May 2024, pp. 1–2.

33 Ensuring Reliable Supply for Adelaide's Eastern Suburbs - Northfield GIS Final Project Assessment Report.

34 SA Power Networks, *5.3.10 – Hindley Street Substation 66kV Replacement* – January 2024.

35 SA Power Networks, *Response to AER IR#018 - onsite follow up questions Confidential*, 7 June 2024.

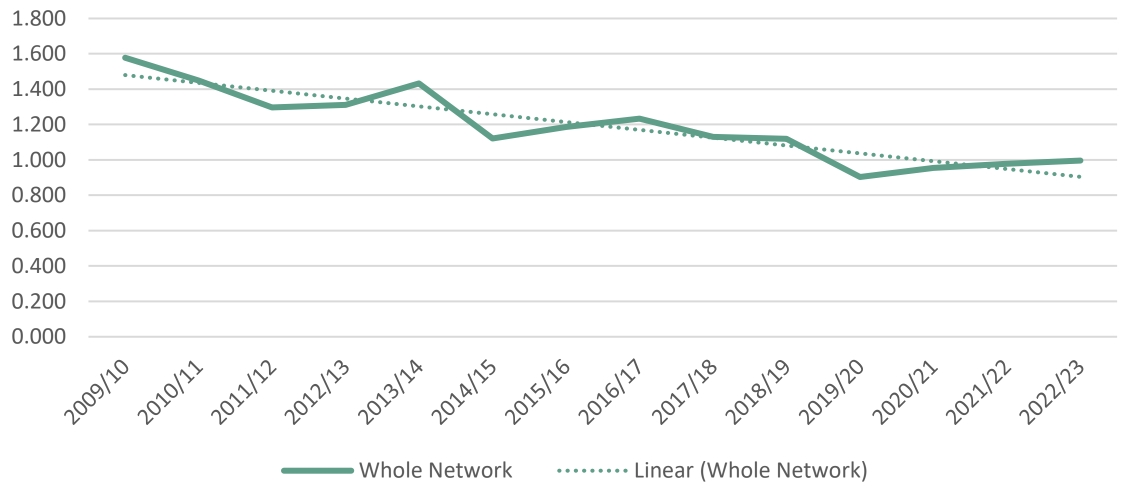
A.1.3.1 Performance

In support of the proposed repex, SA Power Networks raised concerns of a risk of deterioration in reliability performance as a driver for the uplift in expenditure from the current period, with a particular focus on System Average Interruption Duration Index (SAIDI) performance. We have reviewed SA Power Networks' SAIDI and System Average Interruption Frequency Index (SAIFI) normalised[36] performance at a whole of network and feeder category level to understand if there is a deterioration in performance.

While SAIDI can be informative of reliability performance it mostly relates to the network outage response and restoration times. SAIFI, on the other hand is mostly related to the reasons for supply failure and is a more meaningful measure of asset performance and to determine if there is asset deterioration on the network.

Figure A.1 below shows the historic SAIFI performance for the whole network over the last 14 years. Although there is expected variation in performance between years, the trend indicates there is not a worsening of performance. This consists of an ongoing reduction in the number of interruptions for Urban, Short Rural, and Long Rural feeder categories, with all exhibiting a downward long term trend, indicating an improved performance across the period. The performance over the last 5 years (2019–2023) supports this long-term trend, where we observe an improved performance for all feeder categories except for the CBD feeders which is reflected in the recent deterioration in performance in Figure A.1. Further, all feeder categories, except the CBD, are meeting jurisdictional targets.[37]

Figure A.1: Whole of Network SAIFI normalised performance from 2009/10 to 2022/23



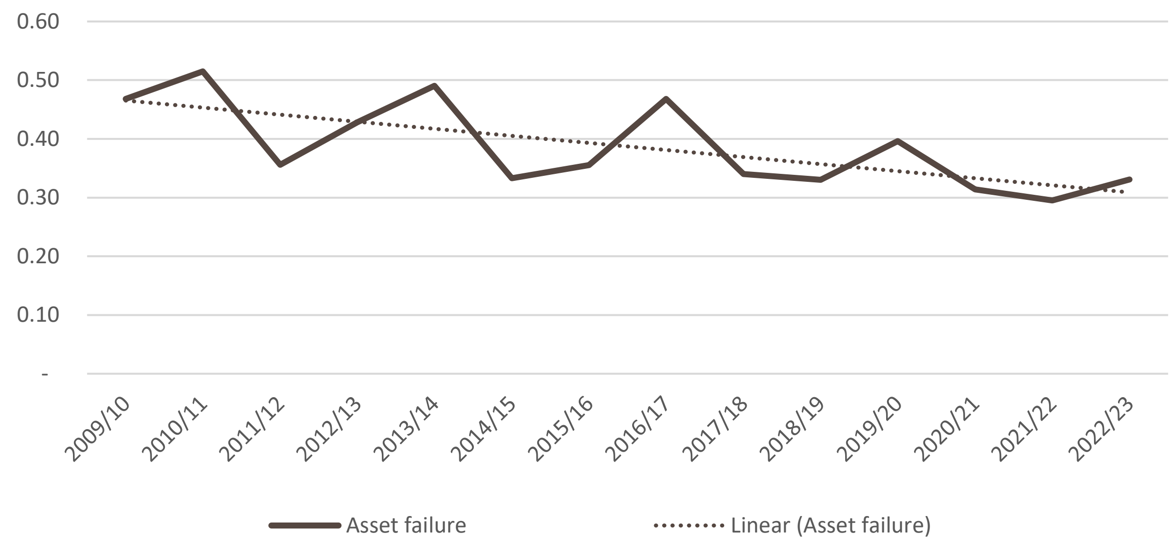
Source: AER annual RIN data analysis.

Asset failure accounts for the main reason for an outage and is a reasonable justification for asset replacement (Figure A.2 below sets out the SAIFI due to asset failure). Our analysis of SA Power Networks' outage performance does not indicate that asset failure is becoming more common, rather, the trend indicates that the rate of asset failure has been reduced.

36 Performance measures are 'normalised' to remove the impact of supply interruptions deemed to be beyond the network service provider's reasonable control.

37 Jurisdictional standards are set out in the Electricity Distribution Code of South Australia administered by ESCOSA. SAIFI Standards are; CBD – 0.15, Urban – 1.15, Short Rural – 1.65, Long Rural – 1.75.

Figure A.2: Whole of Network Asset Failure SAIFI 2009/10 to 2022/23



Source: AER annual RIN data analysis.

Our analysis of SA Power Networks' historic SAIFI data shows that the primary cause, other than asset failure, of changes in normalised SAIFI performance is from vegetation.[38] On average, vegetation caused outages account for over 23% of the outages (excluding planned outages) over the past 5 years.[39] Vegetation is predominately addressed through the vegetation management program.

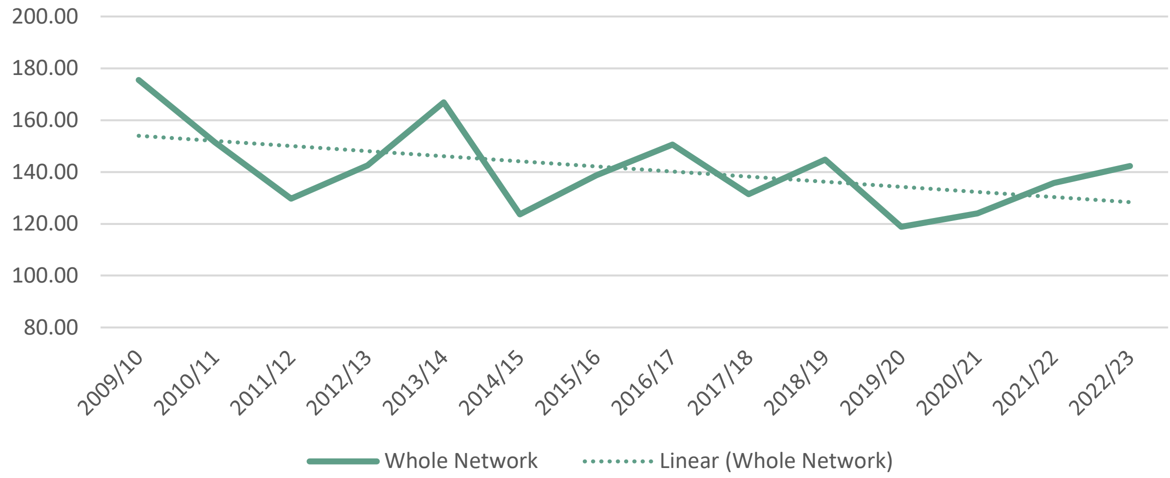
Figure A.3 below shows the historic SAIDI performance for the whole network over the last 14 years. Although there is expected variation in performance between years, the trend indicates there is not a worsening of performance. However, it can be seen that the performance in the last 5 years (2019–2023) is beginning to worsen. This is predominately being driven by the Rural Long and CBD feeder performance. Both Urban and Short Rural feeders are not demonstrating a SAIDI deterioration in performance. However, as stated above, SAIDI is generally not an appropriate metric to determine the need for replacement but is rather a reflection of responsiveness to outages. Moreover, SA Power Networks is currently meeting all its feeder category jurisdictional targets, except for the CBD.

SA Power Networks has proposed a rural restoration program as a part of its reliability augex proposal, this is discussed in A.2.3.2 below. It has also proposed a material CBD performance improvement program, this is discussed in A.1.3.3.

38 AER, Annual reporting RIN data analysis from 2009–23.

39 AER, Annual reporting RIN data analysis from 2009–23.

Figure A.3: Whole of Network SAIDI normalised performance from 2009/10 to 2022/23



Source: AER annual RIN data analysis.

A.1.3.2 Repex Modelling

Below we set out our approach to repex modelling and our concerns with SA Power Networks' repex forecast using its risk-cost model approach.

AER's repex model

As a part of our assessment, we have applied our repex model against SA Power Networks' proposal as a top-down check. Our modelling indicates that SA Power Networks generally use assets longer than other networks but also have higher unit costs than the NEM median for some asset categories. However, given the low coverage of the repex model for SA Power Networks' assets (around 33% of total repex[40]) we have focused on a bottom-up review rather than rely on this top-down assessment.

SA Power Networks' risk-cost model

SA Power Networks has developed an in-house risk-cost model that it used to forecast 67% of its repex proposal. The model calculates the risk in monetary terms and optimises the investment path to meet specific scenarios (e.g. maintaining reliability). We consider SA Power Networks' model adds robustness and rigour to its forecasting approach for various capex elements. This is a good approach and is aligned with our expectations for DNSPs. However, we do have concerns that a number of elements, including the calibration, inputs and assumption may be overstating the need to invest.

To determine the level of investment, SA Power Networks calibrated the risk-cost model using available historic performance data up to 2021–22. SA Power Networks then used the model output 'reliability risk value' for 2021–22 as the benchmark of the desired level of performance that meets its maintain service levels scenario.

For each year following 2021–22, the model determines the change in risk value based on the probability of failure, the likelihood of a consequence and the cost of consequence. The model then determines which individual network assets (e.g. individual conductors, cables

40 The lower coverage is due to unique characteristics such as stobie poles and drier weather in South Australia, which makes it more difficult to reliably compare with other DNSPs.

and poles) should be replaced to bring the risk value back to the 2021–22 risk value level. This is done by first investing in net positive value (NPV) assets, and then by investing in least negative NPV assets to address any residual risk.

Target service level to risk value threshold

Based on our analysis, we consider there is no clear link between SA Power Networks' risk-cost model and the desired service level outcomes. In a response to an information request it became clear that SA Power Networks has assumed a linear relationship between the reliability risk value and SAIDI to model service impacts without being able to support this assumption empirically.[41] It appears that SA Power Networks is unable to translate the reliability risk value to the service impacts (i.e. dollars spent to the SAIDI or SAIFI impact).

We acknowledge that there is a relationship between investment levels and network performance, however, we were unable to calculate the quantum of that impact using SA Power Networks' approach. Without this link being observable, it is difficult to be sure that the proposed investment is an efficient response to the identified need based on the output from the risk-cost model.

SA Power Networks will need to better demonstrate what the expected performance impact the proposed investment level will have on addressing its performance concerns.

Target service level

As highlighted above, SA Power Networks has used a single year (2021–22) to determine what the target service level model output threshold is. Due to the year-to-year variation observed in network performance, there is an inherent risk that the measure to maintain the service level is being understated (due to it being a good performance year) or overstated (due to it being a bad performance year). We consider that it is more appropriate to determine the maintain service level risk value using the average of 3–5 years of performance as this will mitigate the risk of under or over-estimating the underlying performance customers can expect. This also aligns with the AER's approach to setting targets that reflect expected performance.[42]

Input assumptions

Our analysis of the risk cost model has found that reliability risk is the dominant component driving the investment level, so we have reviewed the reliability input assumptions applied in the risk-cost model in more detail. SA Power Networks has taken a high-level approach to consequence assumptions including the likelihood and duration of outages to determine reliability risk values by applying historic averages by voltage level. This approach, as outlined below, has likely overstated the reliability risk cost and consequently the need to invest.

SA Power Networks' approach applies outage duration by voltage level of the entire asset voltage level population, for example, the assumed restoration for 11kV cables is determined by looking at the entire network population for 11kV cables.

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41 SA Power Network*, Response to IR#021 question 4a*, 14 June 2024.

42 AER, *Service Target Performance Incentive Scheme Guideline*, November 2018, p. 10.

We consider this approach is not reflective of the actual restoration experience for both urban and rural customers. By using an average under the voltage level categorisation, regional restoration times from historic data are being applied to assets within customer-dense urban areas when calculating the value of reliability risk. We would expect to see a difference in outage times, on average, between customers in rural areas and urban areas.

Outage data analysis demonstrates this difference for 11kV conductors. Using actual outage data for unassisted failures provided by SA Power Networks,[43] and calculating a 12 year average outage duration by voltage level and feeder category demonstrates that the expected restoration times are different to those assumed by SA Power Networks as set out in table A.1 below.

Table A.1: 11kV Network Conductor estimated restoration outage approach comparison by feeder category (minutes)

Feeder category	SA Power Networks assumed 11kV restoration outage[44]	Outage restoration by voltage level and feeder category
CBD	235.41	0.0
Urban	235.41	186.6
Rural short	235.41	237.3
Rural long	235.41	275.7

Source: SA Power Networks, *Response to IR#026*, 27 June 2024.

Further, the outage restoration is sensitive to the sampling period, and in this case SA Power Networks has used a 12-year average. This can be seen in table A.2 below. EMCa highlights that using averages of extended periods as SA Power Networks has done, does not sufficiently consider the impacts of repex and augex programs that SA Power Networks has undertaken, nor will it adequately reflect any changes to the asset condition or response practices that may impact the frequency or duration of events impacting customers. Selection of shorter and more recent sampling periods is likely to be more reflective of the reliability of the network, and would result in lower values than SA Power Networks has applied.

Table A.2: HV conductor average annual outage duration (minutes)

Annual outage duration	SA Power Networks parameter	12 year average (2011–2022)	5 year average (2018–2022)	3 year average (2020–2022)	Updated 3 year average (2021–2023)
1kV < V <= 11kV	235	235	249	247	197
11kV < V <= 22kV	344	344	392	436	418
22kV < V <= 66kV	390	390	397	414	203

Source: EMCa analysis of SA Power Networks, *Response to IR#014, Questions 26 and 32*, 15 May 2024.

It should be noted that there were a small number of events that resulted in large duration outages in the last two years. The timing of these events were adjacent to large weather

[43] SA Power Networks, *Response to IR#026 Q1, Q1 HV Conductor Failure Data,* 27 June 2024.

[44] SA Power Networks, *Response to IR#018 Q16*, 7 June 2024.

events. It is unclear whether the outage duration for unassisted failures is related or impacted by the weather events.

We consider that SA Power Networks should take into account network characteristics as well as voltage level to better reflect the differences in the network and customer experience for the outage duration assumptions. This has been done at a more granular level within the model in developing the Value of Customer Reliability (VCR) where SA Power Networks has calculated individual VCRs for each asset span.

The difference in the restoration outage assumption is likely to have a material impact on the required investment calculated under the risk-cost model.

We undertook the above test against SA Power Networks' cable risk-cost model and CBD NPV model. SA Power Networks' risk-cost model has assumed that it takes 296.82 minutes to restore CBD cables, while the historic data shows that the five-year average restoration in the CBD for cable unassisted outages is 112 minutes.[45]

SA Power Networks has also used a high-level assumption around likelihood of an outage that we consider is also contributing to an overstatement of the reliability risk. This is observed in the risk-cost model for HV underground cables where it is assumed to have a 100% chance of an outage in the event of a failure, while the actual data suggests the likelihood of an outage is 64%.[46] This results in an overestimation of the reliability risk cost within the cable model. In the 2022–23 year the cable model contains a CBD 11kV reliability risk cost of $2,197,483 and the CBD NPV model contains a risk value of $792,166 for the same 11kV cables.

The assumption that all failures result in an outage is also likely contributing to an overestimated VCR risk within the modelling for the CBD project itself meaning the $2,197,483 figure may also be overstated. This can be seen in figure A.4, which demonstrates the difference in reliability risk values once the outage duration and likelihood assumptions have been adjusted between the cable risk-cost model and the CBD NPV model.[47]

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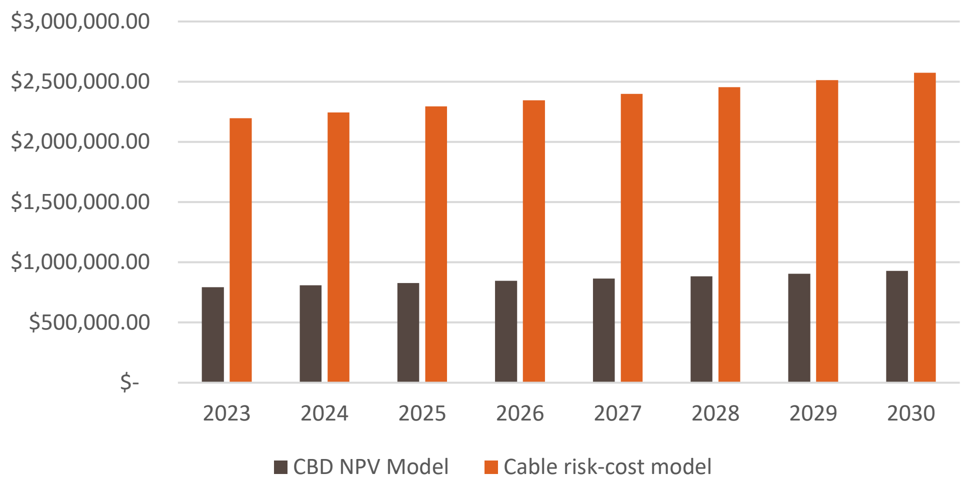
45 SA Power Networks, *5.3.12 - NPV Model - CBD Reliability - Option 2 – Public* – January 2024.

46 Analysis of SA Power Networks, *Response to IR#010 CBD Cable Faults 2011-12 to 2022-23*, 9 May 2024

47 Note that this data was taken from the do nothing scenarios in SA Power Networks, Response, *IR0#14 question 29 cable model* and from the O2_B-VCR cable tab in SA Power Networks - 5.3.12 - NPV Model - CBD Reliability - Option 2 – January 2024, for the same cable segments.

Figure A.4: Calculated reliability risk for 11kV cables in the CBD ($2024–25)



Source: AER analysis, SA Power Networks, *Response to IR#010 CBD Cable Faults 2011-12 to 2022-23*, 9 May 2024.

We are of the view that SA Power Networks should ensure the reliability assumptions used as inputs in the risk-cost model are selected to reflect assets with similar characteristics (e.g. reflecting voltage level and feeder categories) and a more accurate likelihood of an outage is used.

Model calibration

SA Power Networks has drawn from advice from its consultant Frazer Nash to develop its probability of failure model, and which has been calibrated to historical observations. We observed for HV conductors that the probability of failure modelling developed by Fraser Nash assumes an increasing failure trend, which is not consistent with recent data that shows a flat to declining trend for HV conductors (depending on the voltage level) and cables.

This also becomes apparent when looking at specific business cases that have used the risk-cost model as part of the forecast. For example, the predicted failures for 11kV CBD cables with the model is predicting 12.2 failures in 2022–23[48] however, historical actuals average 7.25 failures over the 12 years between 2011–12 and 2022–21.[49] Acknowledging there is a recent increase in outages for the most recent five-year average results in 8 failures per annum.

We asked SA Power Networks to explain the failure data used for calibration purposes. EMCa observed in the information provided by SA Power Networks that the failure rate of HV conductors has been decreasing in recent years and that this would impact the calibration of the model. EMCa confirmed that the analysis was calibrated to a single average of five years, which is considerably higher than recent performance shows. Analysis undertaken by

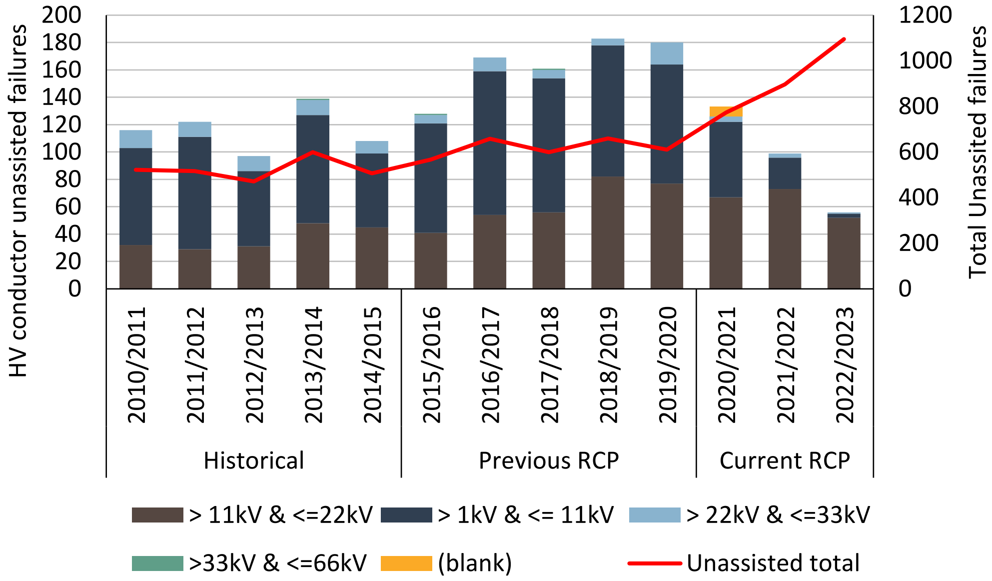
48 SA Power Networks, *5.3.12 – NPV Model - CBD Reliability - Option 2* – January 2024 (02_B-VCR cable tab).

49 SA Power Networks, *Response to AER IR#010 – CBD Cable Faults 2011–12 to 2022–-23*, 9 May 2024.

EMCa indicates that the calibration is sensitive to the averaging period that has been selected.[50]

SA Power Networks has undertaken back-casting of its asset failures to verify the rate of change in the probability of failure over time. This is a useful indicator of the robustness of the model. However, it appears that the values provided, for example conductors, appear to be dominated by the increasing low voltage failure rate, and does not reflect the observed failures of high voltage conductors. This can be seen in figure A.5 below.

Figure A.5: Historical and forecast overhead conductor failures



Source: SA Power Networks, *Response to IR#014, Question 26(a)*, 15 May 2024.

The increase in modelled failures above what has been seen historically results in an increased probability of failure and therefore an increased calculated reliability risk value in the risk-cost model.

Further, SA Power Networks should ensure the calibration of the failure model better reflects observed performance and minimises the upwards bias. This will avoid an upward bias on calculated overall network risk values that would result in an overall investment portfolio that is not prudent or efficient.

A.1.3.3 CBD reliability program

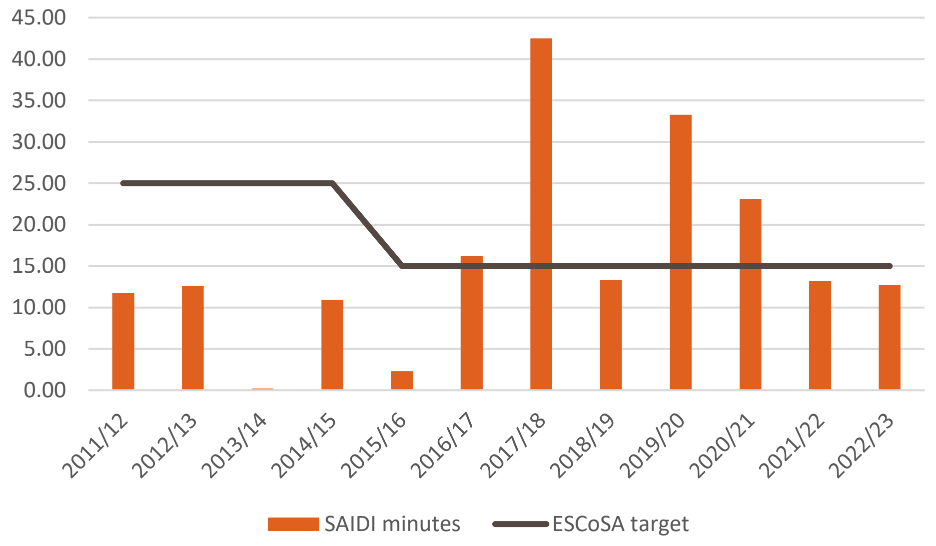
SA Power Networks proposed $90.7 million ($2024–25) to address reliability in the Adelaide CBD. The program consists of both repex ($63.7 million) and augex ($27.0 million) and includes:

- replacing 20.9km of 11kV cable in the CBD
- replacing 2km of 33kV cable in the CBD
- installing 39 automated switches (which is an augex component).

50 EMCA, *Review of aspects of proposed expenditure,* September 2024, pp. 32–33.

SA Power Networks states that this project is driven by the need to meet the SAIDI requirement for the Adelaide CBD of 15 minutes as specified in the Electricity Distribution Code set by the Essential Services Commission of South Australia (ESCOSA).[51] This target has not been met a number of times in recent years as outlined by the historical performance in figure A.6 below.

Figure A.6: Historic CBD SAIDI performance (minutes)



Source: RIN data and SA Power Networks, *Attachment 5 – Capital expenditure* – January 2024.

We are satisfied that SA Power Networks has demonstrated the need to undertake investment to improve service levels in the Adelaide CBD. As a part of the assessment we have reviewed the options analysis used to derive the forecast and the underlying modelling of the proposal (see section A.1.3.2 for our analysis of the risk-cost modelling used for the Adelaide CBD proposal).

Baseline performance

SA Power Networks has used a SAIDI figure of 22.1 minutes as the baseline performance the CBD currently experiences. This has been determined using seven years of data between 2016–17 and 2022–23.[52] This is a material assumption as it dictates the amount of risk reduction required to achieve the SAIDI target.

We consider that the proposed 22.1 minutes as the baseline is likely overstating the current level of reliability risk present in the CBD. For example, under a 5-year average baseline, performance is 18.8 minutes, or under a 10-year average baseline, performance is 17.5 minutes.[53] SA Power Networks has not provided justification for selecting the seven-year period to represent the current risk level in the CBD. SA Power Networks will need to consider a more appropriate baseline that does not overstate the reliability risk present in the CBD.

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[51] ESCOSA, *Electricity Distribution Code*, section 2.2, p. 8.

[52] SA Power Networks, *Response to AER IR#010, Question 2 – SAIFI and SAIDI for CBD options*, 9 May 2024.

[53] SA Power Networks, *Response to AER IR#010 – CBD Questions 1 and 7*, 9 May 2024.

Options analysis

In reviewing the material provided in the proposal and subsequent information requests, it is apparent that SA Power Networks has assumed the topology of the network is fixed when the options were developed to address the identified need. SA Power Networks has only considered cable replacement and switching options using existing feeder configurations in its business case and associated modelling. SA Power Networks did not consider options from a CBD system wide planning perspective that contemplated a more effective configuration of the current network, which we consider is the approach that would be in line with industry practice. This was confirmed by SA Power Networks in a workshop on 5 June and a subsequent meeting on 17 June in response to information requests.[54]

We do not consider that SA Power Networks has examined the option of altering the network topology (through additional ties or feeder sections) either as a standalone solution or blended with cable replacements and switchgear upgrades to address the identified need. Put another way, this project appears to have been assessed as a replacement project without considering the ability to add or amend network sections in an effort to improve reliability. We consider that this is a shortcoming with the options analysis for this project.

Further, SA Power Networks has used SAIDI as a primary measure as justification of the proposed options. As discussed in the repex discussion (A.1.3.2 above), we consider SAIDI is not the most appropriate measure for the need for capex. SAIDI is a reflection of a response to an outage, not an indication of an asset failure problem. Notwithstanding this, we do consider that there is an underlying need to meet the SAIDI requirements outlined in the jurisdictional obligations and that altering topology to improve SAIDI performance is still a potential solution that should be explored.

In addition to the identified SAIDI need, there appears to be a slight increase in the cable failure trend within the CBD, which would be impacting on the SAIFI performance and should also be considered in the options analysis.

Given the need to consider the network configuration we have not accepted SA Power Networks' proposed expenditure for the purposes of this draft decision and have substituted this with an alternative placeholder estimate of $12.2 million using historic CBD cable replacement and switching augmentation expenditure. This is due to SA Power Networks' incomplete options analysis outlined above, and the inability to develop an alternate estimate using the information we have available to us. We recognise that this is a placeholder, and we expect that the resulting expenditure for the CBD reliability program is likely to exceed historical expenditure given it is prudent to address the emerging CBD reliability concerns.

We are of the view that SA Power Networks should include options that do not consider the topography as fixed and should explore augmenting the feeder configuration in the network to improve performance. These options should be explored thoroughly and incorporated in the business case and tested through quantitative options analysis. Demonstrating this would satisfy us that the costs for addressing the SAIDI performance within the CBD are the efficient costs to addressing the CBD reliability concerns.

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54 SA Power Networks, *Response to AER IR#021 – CBD and Repex risk cost model conductors*, 14 June 2024.

Conclusion

Overall, our draft decision is to include an alternative estimate of $772.6 million for replacement expenditure, and we will reassess the capex requirements at the revised proposal stage, taking into account any update to the repex proposal, including the CBD reliability program.

We have derived our alternative forecast of $772.6 million by taking a top down approach. We have accepted the repex forecast that used the historical and independent business case approaches (excluding CBD), but have adjusted the repex proposal that relies on the risk-cost model with historic expenditure (excluding poles). The alternative forecast takes into account our:

- findings that the network performance is not worsening
- concerns around the risk-cost model
- position on the proposed repex component of the CBD reliability program.

A.2 Augmentation expenditure

Augmentation is capital expenditure required to build or upgrade the network to address changes in demand and network utilisation to enable the network service provider to comply with quality, safety, reliability, security of supply and greenhouse gas emission reduction target requirements. SA Power Networks' augmentation consists of expenditure on capacity (including demand driven), reliability, bushfire, resilience, safety, strategic and environment, and the Powerline Environmental Committee Program.

A.2.1 AER's draft decision

We are not satisfied that SA Power Networks proposed augmentation forecast of $505.5 million ($2024–25) reflects the capex criteria.[55] Our decision is to include $423.5 million for augmentation in our alternative capex estimate. This is a $82 million ($2024–25) or 16.2% reduction in augmentation. Most of this reduction, $37 million, concerns a number of demand related projects that can be deferred. There is also a $22 million reduction in the maintain reliability program and a reduction of $23.5 million for the CBD reliability improvement program (discussed in section A.1.3.3 above).

We are satisfied that SA Power Networks' proposed capex on bushfire management, resilience, safety, strategic and environment and the Powerline Environmental Committee Program are prudent and efficient. However, we have concerns with SA Power Networks' proposed capacity and reliability capex forecasts.

SA Power Networks' capacity augmentation expenditure is driven by demand and compliance requirements. We are satisfied that SA Power Networks' proposal on compliance driven augmentation capex is reasonable as it has demonstrated the compliance need for the programs at appropriate forecast costs. However, we are not satisfied that the proposal on demand driven augmentation capex meets the capex criteria.

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55 We must determine whether forecast capex reflects the capex criteria under cl. 6.5.7(c) of the NER.

In developing our alternative estimate for the demand driven capex, we have adopted SA Power Networks' demand forecast as a placeholder for the draft decision. We expect SA Power Networks to update the forecast for the latest information (for example, the Electricity Statement of Opportunities (ESOO) 2024) and provide further evidence to support the reasonableness of its forecast in the revised proposal. Our alternative estimate reduces SA Power Networks' demand driven augex by $37 million. This is a 7.3% reduction on the proposed augex.

As for the maintain reliability program forecast, we have not accepted SA Power Networks' proposed reliability augmentation capital program of $103.1 million but have included an alternative estimate of $81.1 million. This is a reduction of $22.0 million or 4.4% to the proposed augex.

A.2.2 SA Power Networks' proposal

SA Power Networks proposed $505.5 million ($2024–25) augmentation expenditure.[56] This is an increase of 44.2% over the actual/estimated augex in the current period. Augex represents 17.3% of the proposed capex.

SA Power Networks' augex is made up of the following key components that we have considered:[57]

- capacity ($240.9 million)
- reliability ($103.1 million)
- bushfire ($25.6 million)
- resilience ($8.2 million)
- safety ($49.3 million)
- strategic and environment ($13.7 million)
- Powerline Environmental Committee Program ($53.7 million).

Capacity

SA Power Networks has proposed a $240.9 million investment for capacity augmentation expenditure. This includes demand-driven projects ($140.8 million) and compliance-driven projects ($100.1 million).

SA Power Networks proposes expanding/upgrading assets to meet demand and investments triggered by compliance. This comprises programs and projects extending or upgrading the sub-transmission, distribution and low voltage networks, and transmission connection points and substations.

For demand-driven projects, SA Power Networks has used AEMO's transmission connection point forecasting methodology using AEMO's forecasting portal to produce its demand forecasts. It has then reconciled the forecasts to the system demand forecasts for South

56 This number includes an augex efficiency adjustment of $16.0 million that SA Power Networks has put forward if an ICT program is accepted. See section A.4.

57 With the exception of the CDB augex ($27 million); see section A.1.3.3.

Australia in AEMO's Electricity Statement of Opportunities (ESOO) 2022 demand forecast and made further block load adjustments to the AEMO forecast.[58]

Reliability

SA Power Networks has proposed $103.1 million ($2024–25) on network upgrades to manage and maintain reliability. This is $16.1 million (18.6%) higher than the actual/expected expenditure in the current regulatory period.

SA Power Networks explains that the proposed expenditure is being driven by declining performance (SAIDI) on the jurisdictional restoration targets and customer preferences to improve reliability to worst served customers.[59]

Bushfire

SA Power Networks has proposed $25.6 million for its two bushfire risk management programs to reduce the risk of network assets starting fires and the impacts on customers when power is disconnected during high bushfire risk periods. This includes mitigations for bushfire risk and public safety power shutoff.

The bushfire augex proposal is an extension of SA Power Networks' business-as-usual repex program as part of its bushfire risk management system, targeting feeders in both high and medium bushfire risk areas.[60]

Resilience

SA Power Networks is proposing 3 mobile generators for approximately $8.2 million with a combined capacity of 9MVA. [61]

Safety

SA Power Networks is proposing $49.3 million is safety augmentation to improve the management of safety risks to the public and network workers. The expenditure consists of 5 programs including protection systems compliance and substation security and fencing programs, which covers 63% of the proposed safety augex.[62]

Strategy

SA Power Networks is proposing $5.2 million in strategic augex. The strategic programs include specific one-off programs to manage key network risks and compliance issues and optimise long term expenditure to ensure security of supply.

Environment

SA Power Networks is proposing $8.5 million for environment augmentation expenditure to continue the oil containment program and ensure it is managing environmental risks to comply with its legal requirements.

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58 SA Power Networks, *5.4.2 – Augex Capacity* – January 2024, p. 15.

59 SA Power Networks, *5.9.3 – Maintaining underlying reliability performance* – January 2024, p. 16.

60 SA Power Networks, *5.6.1 – Bushfire Risk Management Programs* – January 2024.

61 SA Power Networks, *5.8.3 – Network Resilience mobile generation* – January 2024, p. 21.

62 SA Power Networks, *5.8.5 – Augex Network Safety* – January 2024, p. 10.

Powerline Environmental Committee Program

SA Power Networks is proposing $53.7 million in augex for the Powerline Environmental Committee Program. This program is an undergrounding program to improve the aesthetics of electricity infrastructure to benefit the community, having regard to road safety and electrical safety.[63]

A.2.3 Reasons for decision

Our review has mainly focused on the capacity, reliability, bushfire and resilience related expenditure. This accounts for 75% of the total proposed augmentation expenditure. We found that SA Power Networks' approach to forecasting the proposed safety, strategic and environment proposed expenditure to be reasonable and did not require an in-depth review.

We have also accepted SA Power Networks' powerline environment program as it is an allowance determined in accordance with the Electricity (General) Regulations and approved by an independent committee.[64]

A.2.3.1 Capacity

SA Power Networks' proposed capacity augex consists of demand driven and compliance driven capital programs. We are satisfied with the compliance driven augex forecast and our focus has been on SA Power Networks' demand forecast and the capacity augex underpinned by the demand forecast.

In the sections below, we discuss each component in more detail.

Demand Forecast

Maximum demand forecasts are fundamental to a distributor's forecast capex and opex, and to our assessment of that forecast expenditure. This is because we must determine whether the capex and opex forecasts reasonably reflect a realistic expectation of forecast demand for services.[65] Reasonable demand forecasts based on the most current information are important inputs to ensuring efficient levels of investment in the network.

SA Power Networks has adopted AEMO's transmission connection point forecasting methodology and used AEMO's forecasting portal for its peak demand projections, which is aggregated and reconciled to AEMO's state-based system peak demand forecasts. We consider it to be an appropriate forecasting approach. SA Power Networks has relied on AEMO's ESOO 2022 demand forecast for reconciliation and now needs to update its forecast using the most recent available data for the revised proposal. Our assessment includes evaluating SA Power Networks' application of AEMO's forecasting methodology and the reconciliation, including the reasonableness of its specific block load adjustments.[66]

In the reconciliation, SA Power Networks made block load adjustments in relation to Battery Energy Storage Systems (BESS), data centre load and other block loads to the AEMO's

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63 SA Power Networks, *5.8.9 – Justification document: Powerline Environmental Committee: 2025–30 Regulatory Proposal* – January 2024, p. 5.

64 PLEC is convened by the Office of the Technical Regulator (OTR). Typically, projects are funded two-thirds by SA Power Networks and one third by councils and construction is completed via a competitive tender process.

65 NER, clauses 6.5.6(c)(3) and 6.5.7(c)(1)(iii).

66 Block loads are step changes occurring over the forecast period to the historical trend in demand.

system peak demand forecasts. We sought further information from SA Power Networks through a number of workshops and information requests to better understand its additional adjustments on AEMO's system peak demand forecasts.[67] In undertaking our review of the demand forecasts, we are concerned that SA Power Networks' block load adjustments may be overstated or duplicated. As a result of our review, SA Power Networks has agreed that its block load adjustments related to BESS should not have been made as the load is not expected to contribute to the peak demand, and will remove them from future forecasts.

Notwithstanding this adjustment we still have concerns about the remaining non-BESS related block load adjustments because SA Power Networks did not provide sufficient evidence to demonstrate that these adjustments were additional block loads not already included in the AEMO system demand forecast. For example, a load increase from a significant commercial development at the transmission point level could be due to a combination of a load transfer and new load driven by economic growth. In such cases, any further adjustment to the AEMO system demand forecast could lead to duplication. It is important to emphasise that block load adjustments at the system level should only be made when the loads or projected changes are not already captured in the system demand forecast and are significant at the system level. SA Power Networks has not demonstrated that it has taken steps to ensure these block load adjustments are not duplicated.

Another concern we have is SA Power Networks' application of its threshold for block loads. SA Power Networks applies a 5% materiality threshold for making block load adjustments at the relevant local levels, which we consider appropriate as it prevents potential duplications with trend projections. However, SA Power Networks appears to have applied a block load adjustment at the system level when the 5% capacity threshold is met at a transmission connection point level, which does not necessarily mean the 5% system capacity threshold is met. This would result in overestimation.

SA Power Networks has not provided conclusive supporting information to justify the appropriateness of these additional loads. We are concerned that these block loads may have already been accounted for in AEMO's forecast trend, which could lead to forecast duplication or overestimation.

Additionally, to avoid overstating the forecast, SA Power Networks needs to carefully evaluate potential overestimations in customer-requested loads, the likelihood of projects not proceeding, and the impact of project loads on seasonal and system peak time. In the revised proposal, SA Power Networks should detail the measures it has in place to mitigate the risk of overestimation in the forecast. For the purposes of the draft decision, we have adopted SA Power Networks' peak demand forecasts as a placeholder to develop our alternative estimates on demand driven capacity augex (as outlined below). However, we expect SA Power Networks to address our concerns and update its demand forecasting using the latest available information in its revised proposal. We will then reassess the peak demand forecast and its resulting demand driven augex at the revised proposal stage.

In the revised proposal, we expect SA Power Networks to:

- update the demand forecast using the latest available data and AEMO forecasts

[67] SA Power Networks, *Response to AER Information Request #012,* 14 May 2024.

- demonstrate the reconciliation between AEMO's forecast and SA Power Networks' additional block load adjustments and provide evidence on measures it has in place to ensure that the block load adjustments are not duplicated or overstated
- clearly map out the demand forecast to specific augmentation projects to demonstrate the optimal timing of the proposed projects.

Capacity

SA Power Networks' proposed capacity augex encompasses both demand-driven and compliance-driven capital programs. It has linked the demand-driven expenditure to a significant resurgence in forecast demand growth.[68] Our assessment and draft decision regarding the demand forecast is set out above. In the following section, we set out our assessment of SA Power Networks capacity augex.

We have based our assessment on SA Power Networks' proposal, additional information provided by SA Power Networks through information requests and workshops[69] and submissions from stakeholders. Further EMCa was engaged to undertake a technical review of SA Power Networks' demand driven augmentation expenditure requirements based on SA Power Networks' proposed demand forecast.

We have reviewed SA Power Networks' expenditure forecasting methodologies and the robustness of the forecast. For projects involving high voltage network elements or specific work types, SA Power Networks uses a hybrid forecasting practice that incorporates both probabilistic and deterministic planning criteria.[70] We consider the inclusion of probabilistic project selection criteria is a positive enhancement to SA Power Networks' forecasting approach. SA Power Networks should endeavour to move to a full probabilistic approach over time.

Based on the current forecasting approach EMCa is concerned that the proposed capacity augex is overstated. Whilst SA Power Networks has prudently excluded some projects by adopting a hybrid planning approach, EMCa considers that SA Power Networks has not sufficiently tested the prudency of its forecast across all capacity projects. For example, SA Power Networks will include a project to relieve a capacity constraint under N-1 conditions if the NPV is greater than zero. For projects where the NPV results are marginally around zero (either positive or negative), SA Power Networks has not undertaken further analysis to determine the project's sensitivity to the assumptions used. SA Power Networks' forecast included some projects with low net benefits that could not withstand even small variances over the relatively long study period.

EMCa's main concern about SA Power Networks' criteria were that:

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68 SA Power Networks, *5.4.2 – Augex Capacity* – January 2024, p. 15.

69 On-site workshop at SA Power Networks' office with EMCa on 22 – 24 May 2024.

70 As deterministic planning methods focus on the extent of the redundancy built into the network, such methods do not explicitly consider network performance or consumer benefit of any resulting network investment. In contrast, probabilistic planning methods consider network performance outcomes in terms of consumer benefit/disbenefit because the risk of supply interruptions is explicitly considered in terms of the likelihood of such an event. Consequently, probabilistic planning methods explicitly demonstrate the likely consumer costs and benefits and are more likely to be prudent and efficient.

- projects with a low but positive NPV are particularly susceptible to variances, such as changes in demand or costs
- a positive NPV does not establish that the optimal timing for augmentation is within the next period.

EMCa considers that several projects could be prudently deferred until the subsequent 2030–35 regulatory control period taking the above concerns into account. To evaluate the robustness of the forecast, EMCa has applied a minimum benefit cost ratio[71] (BCR) filter of 1.2 or lower to all projects identified from the hybrid forecasting approach (as described above), testing each project that had been included based on a positive NPV against small variances.

This analysis shows there are 9 projects with a BCR less than 1.2. Each of these projects has an economic timing beyond the current regulatory control period, with relatively low BCRs and mostly negative NPVs even with a 20-year study period. This is set out table A.3 below:

Table A.3: Projects proposed based on probabilistic risk-cost, for which BCR is less than 1.2 ($ million $2022)

Project	Start Year	Cost in period	NPV (20 year)	Benefit/ cost ratio	Economic timing	Limiting criterion[72]
Virginia sub upgrade	2028	6.9	971	1.16	2032	N-1/50PoE
Nairne sub upgrade	2028	4.6	-3,870	0.05	N/A	N/10PoE
Kingston SE sub upgrade	2025	1.5	-624	0.09	N/A	N/10PoE
Portee sub upgrade	2026	1.8	-1,001	0.01	N/A	N/10PoE
Mount Burr Sub Upgrade	2025	0.4	-180	0.53	2035	N/10PoE
Spalding 11kV sub + regulator upgrade	2027	0.4	-269	0.31	N/A	N/10PoE
Qualco sub upgrade	2027	2.5	-212	0.85	2035	N/10PoE
Hatherleigh-Robe #2 33kV line	2029	12.6	272	1.03	2034	N/10PoE
Waterloo to Riverton Tee 33kV Line Upgrade	2026	0.9	133	1.15	2033	N/PoE50
TOTAL ($2022)		**31.5**				

Source: EMCa analysis.

We consider that SA Power Networks should undertake further analysis to test the sensitivity of the project forecasts to ensure they are robust, and the proposed expenditure is truly necessary in the circumstances. Our draft decision is to exclude these projects from SA Power Networks' demand driven augex. These equate to $37 million in $2024–25.

71 Minimum benefit cost ratio refers to the lowest acceptable ratio of the total benefits to the total costs of an investment.

72 SA Power Networks, *5.4.2 – Augex Capacity – Appendix C* – January 2024.

SA Power Networks' cost benefit analysis modelling does not inform the economically optimal timing for the projects, which raises concerns about the prudency of the proposed expenditure. Furthermore, there is insufficient evidence of the correlation between the demand forecast and the associated projects. We consider that SA Power Networks needs to incorporate the optimal timing of the demand driven projects in its analysis to be included in the revised proposal. SA Power Networks needs to clearly demonstrate how the updated demand forecast influences the relevant expenditure projects and programs, and how this cannot be address through other means that avoid building more network infrastructure.

Overall our draft decision is to include an alternative estimate of $204 million for capacity augmentation expenditure by removing the $37 million (9 projects referred to in table A.3 above) from SA Power Networks' proposed capacity forecast of $241 million. We will reassess the capex requirements at the revised proposal stage, taking into account the updated demand forecast.

A.2.3.2 Reliability

The augex reliability program is to address network reliability concerns that are not being addressed through the deployment of the repex program or other augex programs. Its purpose is predominately to ensure network reliability is maintained,[73] however it can also cover programs that are designed to improve reliability for poor performing parts of the network. SA Power Networks proposes four reliability programs in addition to the CBD reliability program (CBD reliability is set out in section A.1.3.3):

- maintaining underlying reliability on the network ($72.1 million)
- 3 programs to address the worst served customers on the network:
  - low reliability feeder improvement program, targeting the worst performing feeders ($10.5 million)
  - rural long feeder supply restoration improvement program, targeting worst performing rural long feeders ($5.0 million)
  - regional reliability improvement program, targeting the poorest performing regions ($15.5 million).

The majority of the reliability program is accounted for by the forecasted maintain reliability program and worst served customers improvement programs. Our review focused on these components of the program proposal and is set out below.

Maintaining underlying reliability on the network

We engaged EMCa to provide advice on the proposed maintaining underlying reliability program and on the worst served customer improvement augmentation programs. We have reviewed SA Power Networks' reliability performance and the cost-benefit models used to justify the expenditure.

EMCa reviewed SA Power Networks' claims of a deterioration in performance and a need to meet jurisdictional targets as a driver for the maintain reliability program.

EMCa observed that SA Power Networks states in its Annual Reliability Performance Report for 2023 that the distribution system's reliability had been maintained during 2023:[74]

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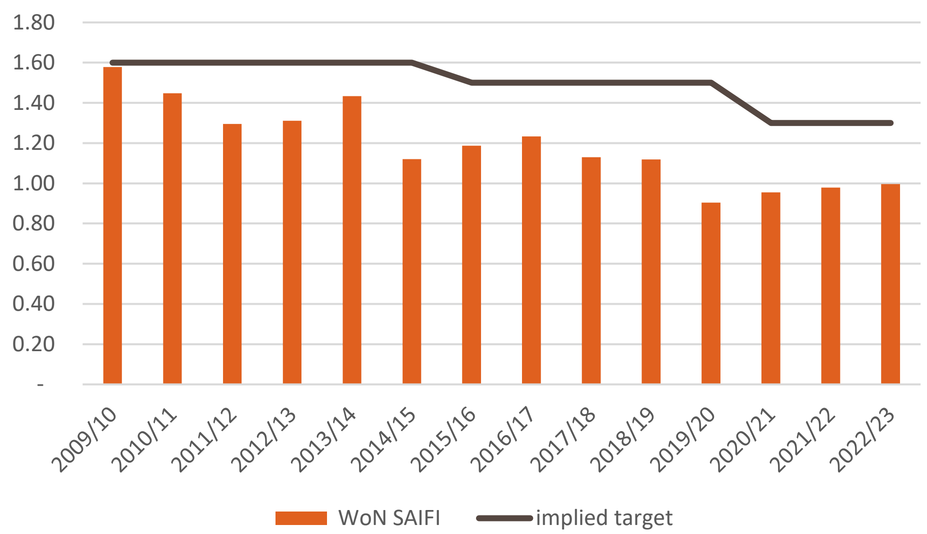
73 NER, cl 6.5.7(a)(3)(iii).

74 SA Power Networks, *Annual Reliability Performance Report*, August 2023.

- the normalised reliability of the distribution system has been maintained
- the Unplanned SAIDI (USAIDI) contribution due to equipment failure-related interruptions is stable
- the USAIDI contribution from weather related interruptions is not increasing
- the average restoration of supply times for major event days have been maintained
- the equipment failure percentage contribution to USAIDI during major event days has been stable.[75]

EMCa highlights in its analysis of SA Power Networks' SAIDI and SAIFI performance data that it is unlikely that SA Power Networks is at risk of not meeting the jurisdictional targets. Figures A.7 and A.8 highlight that SA Power Networks has been meeting its jurisdiction targets for both SAIDI and SAIFI at the whole of network level. In addition, ESCOSA's review of the jurisdictional service standards did not raise concerns about performance in SA, noting that for all feeder categories, except for the Adelaide CBD, performance has been better than the performance targets.[76]

Figure A.7: Distribution system unplanned system average interruption frequency index normalised (USAIFI) and implied whole of network jurisdictional target.

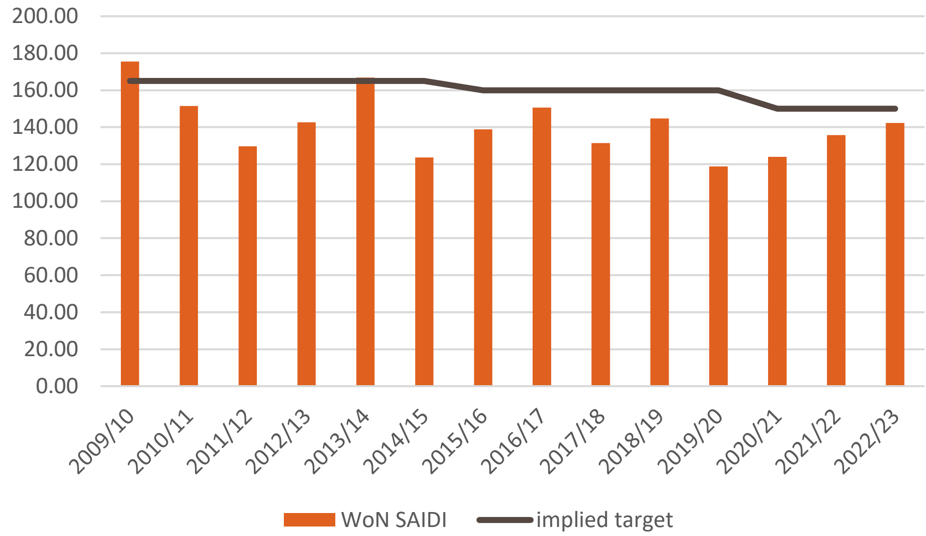


Source: RIN data and SA Power Networks, *Attachment 5 – Capital Expenditure* – January 2024.

75 EMCa, *Review of Aspects of Proposed Expenditure,* September 2024, p. 63.

76 ESCOSA, *Electricity Distribution Code review*, June 2023, p. 21.

Figure A.8: Distribution system unplanned system average interruption duration index normalised (USAIDI) and implied whole of network jurisdictional target



Source: RIN data and SA Power Networks, *Attachment 5 – Capital Expenditure* – January 2024.

EMCa notes there is a slight deterioration in performance, however it considers that SA Power Networks' investment in the current period will likely address this trend.[77]

EMCa's advice supports our analysis of the performance data at a feeder category level. It found that, with the exception of the CBD, all jurisdictional targets are being met and it does not appear there is a trend towards a worsening of performance.

Taking the above into account, we consider that actual performance does not support the proposed expenditure increase in the next period.

We do not consider that SA Power Networks has adequately justified the level of expenditure for the next regulatory period because:

- the reliability performance has met ESCOSA's reliability targets (except for the CBD)
- SA Power Networks' Annual Planning Report 2023 does not support the extent of the increase in expenditure proposed for the next regulatory period
- weather-related impacts may be more effectively mitigated by opex solutions (such as vegetation management)
- uplifts in asset replacement and other augmentation programs will improve reliability for the customers that benefit from these investments – the impact on underlying reliability performance from this investment does not appear to have been taken into account by SA Power Networks
- other reliability improvement programs should contribute to reducing outage duration, albeit only to a small extent – the proposed expenditure for low reliability feeders, long rural feeders and regional reliability programs are targeting the duration of outages experienced by customers.

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77 EMCa, *Review of Aspects of Proposed Expenditure,* September 2024, pp. 61, 63.

Taking into account the above, including advice from EMCa, we have reduced the forecast for the maintain reliability program by $22.0 million. The adjustment is based on the long-run average of revealed costs over the last eight years. Our draft decision for reliability augmentation expenditure takes into account reactive expenditure to address the impact of the juvenile grey headed flying foxes (i.e. fruit bats). Fruit bats have had an impact on SAIDI and the reliability performance of the network in recent years.[78] Currently, this is being addressed through opportunistic upgrades, which we consider appropriate to continue.

Worst served customers reliability improvement program

We have accepted SA Power Networks' proposal of $31.0 million for this program.

We were initially concerned that there was a risk of duplication between the programs. Through our analysis of the targeted feeders in the program some duplication was identified, however, the costs were immaterial and the performance benefits to effected customers outweighed the potential reduction in expenditure. Further, these programs have broad support from the community.[79]

EMCa considers that the projects undertaken for these programs face the same small variances in the NPV analysis as the capacity augex program, such as variances in input costs.

EMCa undertook the same sensitivity check it applied to the demand driven projects (the minimum benefit cost ratio (BCR) described above) to test the robustness of SA Power Networks' proposed program. EMCa found that although there were some individual projects that had low positive NPVs, as a whole, SA Power Networks' modelling was robust.

A.3 Innovation Fund

We recognise the importance of innovation investment in supporting the energy transition and protecting vulnerable customers. Trials and pilots enable businesses to test and explore new ideas, concepts and technology before committing to implementation of solutions and rolling these into business-as-usual activities. We acknowledge the potential benefits of having explicit ex-ante innovation funding within the regulatory framework, together with on-going consumer oversight, performance reporting and information sharing.

We consider funding through a distribution determination where this meets our innovation criteria.[80]

A.3.1 AER's draft decision

We are not satisfied that SA Power Networks' proposed innovation fund expenditure of $16 million ($2024–25) on capital expenditure and $4 million ($2024–25) on operating expenditure reflects the capex criteria.[81] We recognise the importance of innovation investment in supporting the energy transition, however, we consider that SA Power

78 SA Power Networks, *5.9.3 – Maintain underlining reliability program* – January 2024, p. 10.

79 For example, in submissions to the Issues Paper, the District Council of Streaky Bay and SA Power Networks' regional and remote customers sub-committee of the Customer Advisory Board support the program.

80 AER, *Final decision – Attachment 5 – Capital expenditure – Ausgrid distribution determination 2024–29*, 30 April 2024, pp. 35–41.

81 NER, clauses 6.5.7(c) and 6.5.6(c).

Networks needs to do further work on its innovation plans. As a placeholder our draft decision has not included SA Power Networks' proposed innovation fund expenditure in the total capex forecast. We require SA Power Networks to undertake further consideration of the suite of programs in conjunction with its stakeholders and provide us with firmer plans and more detail on the costs for the proposed innovation programs.

A.3.2 SA Power Networks' proposal

SA Power Networks proposed a total of $20 million ($2024–25) for its innovation fund, with $16.0 million allocated to capex and $4.0 million to opex.

SA Power Networks' innovation fund focuses on three key areas:

- community resilience initiatives (capex of $11.0 million)
- enabling and leveraging future markets (capex ranging from a minimum cost of $4.6 million)
- sustainability solutions (capex ranging from a minimum cost of $2 million).[82]

The proposed $4.0 million in operating expenditure is for enabling and leveraging future markets related projects.

Subsequently,[83] we requested SA Power Networks to reconcile the individual projects with the proposed $20 million fund. However, the additional information provided by SA Power Networks did not reconcile these projects. Instead, it provided new information reflecting a 55% increase in costs beyond the original proposal, with $21 million in capex and $10 million in opex, totalling $31 million.[84]

Additionally, there were shifts in both capital and operating expenditures across the initially proposed projects. Despite these changes, SA Power Networks stated that it does not intend to alter its original $20 million proposal it submitted in January 2024.[85]

A.3.3 Reasons for the decision

We assessed the prudency of the intended projects and costs based on the 5 criteria developed in our recent NSW distribution determination for Ausgrid (innovation criteria):[86] The innovation criteria are:

- the proposed projects in the program must be 'innovative'
- the justification for the proposed projects must be linked to the expenditure objectives
- the business has explained how the existing incentive schemes, allowances and government grants have been genuinely exhausted

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82 SA Power Networks, *5.7.7 – Innovation Fund – January 2024;* and SA Power Networks, *Response to AER's information request #002*, 13 March 2024.

83 SA Power Networks Innovation fund workshop, 5 May 2024.

84 SA Power Networks, *additional information on workshop discussion points*, 9 June 2024.

85 SA Power Networks, *additional information on workshop discussion points*, 9 June 2024, p. 39.

86 AER, *Final decision – Attachment 5 – Capital expenditure - Ausgrid distribution determination 2024–29*, 30 April 2024, p. 34.

- the proposed projects must be prudent from a scale perspective for a trial/pilot phase including success factors/criteria applied to trials/pilots to assess whether it proceeds to the business-as-usual phase
- there is stakeholder support for the innovation expenditure.

We have received a range of perspectives on innovation from various submissions. The majority of the third-party providers who are interested in future markets, such as Sonnen Australia Pty Ltd, Smart Energy Council, SwitchDin Pty Ltd, Tesla and Amber Electric, support the spending on innovation.

However, other stakeholders including CCP30 and Energy and Water Ombudsman of SA advocate for an in-depth review of the proposed funding. While the South Australian Department for Energy and Mining considers that SA Power Networks does not require an innovation fund and that it is already innovative without consumer funding.[87]

We found that the initial proposal was conceptually based and did not include information we would expect to see on the scope and efficiency of the intended projects. This made it difficult for us to assess it against our assessment criteria.

To further understand the proposal, we engaged with SA Power Networks through an information request[88] and conducted a workshop[89] to better understand the proposed initiatives.

In response, SA Power Networks provided additional information in June,[90] including revised forecast costs for 8 specific innovation projects. The new forecasts include $21.0 million in capex and $9.1 million in opex.[91] However, SA Power Networks did not sufficiently explain the reasons for these changes or whether they were due to adjustments in project scope or a revised project plan for utilising the fund. We are also concerned the updated forecasts and programs have not been adequately consulted with its customers. Notwithstanding the new information from SA Power Networks, it has confirmed that it does not intend to change its initial proposal.[92]

We consider SA Power Networks has numerous ideas but lacks firm plans for specific projects. SA Power Networks has indicated it will engage with its Consumer Advisory Board on project details once the innovation fund is approved.[93]

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87 Department for Energy and Mining, *Submission – 2025-30 Electricity Determination – SA Power Networks*, May 2024, p. 3.

88 AER, *Information Request IR#002*, 5 March 2024.

89 SA Power Networks Innovation fund workshop, 5 May 2024.

90 SA Power Networks, *additional information on workshop discussion points*, 9 June 2024.

91 Community resilience $3.1 million, Enabling & Leveraging the Future Market $15.2 million, Sustainability Solutions $2.7 million.

The project costs proposed by SA Power Networks in its updated response have changed significantly from its initial proposal. A primary example of this is the initial estimate for community resilience projects of $11.0 million where the updated information provided by SA Power Networks has reduced to $3.1 million across two projects. The updated information has also significantly increased the proposed costs associated with Enabling and Leveraging the Future Market projects with these costs increasing from a total of approximately $6.0 million to $15.2 million across the four projects.

92 SA Power Networks, *additional information on workshop discussion points*, 9 June 2024, p. 39.

93 SA Power Networks, *5.7.7 – Innovation Fund* – January 2024, p. 6.

The proposal and responses from SA Power Networks have shown limited evidence of clearly defined issues, the purpose of the innovation, and the intended benefits for consumers. Many projects appear similar, yet are treated as separate with no recognised synergies or efficiencies, requiring further justification for the capex associated with its innovation fund.

SA Power Networks has focused on developing technology for network solutions. While we recognise the merit in investigating and trialling emerging technologies, we question whether some of these activities could be considered business as usual and potentially funded through the capital program.

Furthermore, not all proposed projects have been demonstrated to be truly ‘innovative’, nor has it been shown that the scale of some projects is appropriate for a trial or pilot phase. SA Power Networks needs to clarify how it will use the fund for innovative initiatives and how these will transition into business-as-usual activities.

Proposed innovation projects

Based on the information provided,[94] we set out below our initial observations about the potential initiatives proposed having regard to the innovation criteria.

Community resilience

SA Power Networks proposed two projects within this initiative, an emergency services data sharing project and co-funded community resilience project involving the deployment of ARENA funded and SA Power Networks funded batteries. The implementation risks being addressed by these projects could be sufficiently addressed through the deployment of the ARENA-funded battery and existing engineering practices. Further the SA Power Networks funded battery appears to be a full roll out which should be considered as part of augex rather than the innovation fund. We consider further information will be required to support the prudency and efficiency of this proposed initiative.

Sustainable solutions

The proposed projects are centred around electrifying components of the fleet including developing 10 hybrid elevated work platforms (EWP) vehicles and associated charging infrastructure, managing visibility of the fleet for dispatch and trialling heavy all-electric vehicles.

We consider that the insulated hybrid EWPs are already available in the market and that the hybrid work platform and charging infrastructure components of this project do not satisfy the innovation criteria. SA Power Networks has also proposed expenditure for EV infrastructure in the proposed property capex,[95] and it is questionable what should be included as innovation. Further, it is unclear what the need is for the implementation of EV charging visibility given the commercial availability of this software. Notwithstanding these concerns, the proposal to trial a fully electric EWP and heavy EV may address the innovation criteria and could be prudently scaled.

94 SA Power Networks, *additional information on workshop discussion point*, 9 June 2024.

95 SA Power Networks, *5.11.7 – Recurrent Property Portfolio 2025-30 Regulatory Proposal* – January 2024, p. 36.

Enabling and leveraging the future market

SA Power Networks proposed 5 projects, which are largely ICT in nature (with the exception of the tariff transition support).[96]

Based on the information provided by SA Power Networks most of these projects may meet the innovation criteria, other than the tariff transition support project because this is not a new concept, technology/technique or activity that is innovative.[97]

Our primary concern with these projects is the evidence of prudent project scaling. These projects appear to be developing complete solutions to address the innovation need as opposed to incrementally testing components of the innovative approach. Further the projects are similar in nature and involve the development of applications that provide access to network data, network analysis, and/or integration into existing or proposed network management systems. However, the estimates seem to treat these as separate standalone projects with no efficiencies recognised between them.

Conclusion

In summary, we have the following key concerns with SA Power Networks innovation proposal and the application of our innovation criteria:

- no firm plan – although we do not expect SA Power Networks to provide detailed business cases and cost-benefit analyses for innovative projects, we do expect SA Power Networks to demonstrate firm plans, including clear expectations in undertaking the work for the desired outcomes with its customers
- continuously evolving cost and scope – SA Power Networks' forecast appears to be inconsistent with information provided. Additionally, the various forecast costs provided at different times do not reconcile with the proposed forecast
- ICT projects carry a higher risk compared to other innovation initiatives because if these efforts are unsuccessful, the financial burden on customers could be significantly higher. SA Power Networks must carefully consider the appropriate scale for trialling these projects.

On the basis of our concerns describe above, we are not satisfied that SA Power Networks has demonstrated its proposed innovation fund is prudent and consistent with the innovation criteria. We would expect SA Power Networks to provide the following supporting evidence in its revised proposal:

- a firm list of projects that:
  - reconcile with the proposed forecast expenditure
  - can demonstrate detailed cost build up and input assumptions
  - quantify the expected type of benefits and efficiencies and how these will be measured; and

96 SA Power Networks, *Response to AER's information request #002*, 13 March 2024.

97 Our final decision for SA Power Networks' 2015–20 distribution determination approved a step change for an additional four FTEs to provide support and education to small and medium businesses to help them manage the transition to cost-reflective tariffs; AER, *Final Decision SA Power Networks distribution determination 2015–20 – Attachment 7 – Operating expenditure*, October 2015, pp. 77–78.

  - detailed project timelines.

- clearly demonstrate why the projects are transformative rather than core improvement and efficiency that should be part of normal business operations
- explain how the knowledge from the innovation projects will be shared with industry, consumers, and regulators. Knowledge sharing is critical to minimise duplication between network service providers. Where similar projects have been undertaken by others, SA Power Networks should demonstrate how any shared lessons have been considered and used to inform the proposed project, and what the incremental benefit its project is
- whether SA Power Networks is the appropriate party to undertake the proposed innovation compared to a contestable market participant and if there are any ring-fencing concerns. Particularly in the case of the community resilience and enabling and leverage future market components.

A.4 Information and Communication Technology

Information and communication technology (ICT) refers to all non-network related devices, applications and systems that support SA Power Networks business operations. ICT expenditure is categorised broadly as either replacement of existing infrastructure for reasons due to end of life, technical obsolescence or added capability of the system with the acquisition of new assets.

A.4.1 AER's draft decision

We are satisfied that SA Power Networks proposed ICT expenditure of $300.8 million ($2024–25) reflects the capex criteria.[98] We have included this amount in our total capex forecast. We consider that the proposal has clearly articulated a program that is prudent and efficient and aligning with our ICT Guidance Note.[99]

A.4.2 SA Power Networks' proposal

SA Power Networks has proposed $300.8 million ICT capex in the next period,[100] with $168.8 million attributed to recurrent ICT and the balance of $135.5 million to non-recurrent capex.[101] SA Power Networks has further disaggregated ICT expenditure into 6 sub-categories:[102]

- recurrent –
  - maintain existing services
  - cyber security refresh.
- non-recurrent –
  - maintaining existing services – large upgrades and replacements

98 We must determine whether forecast capex reflects the capex criteria under cl. 6.5.7(c) of the NER.

99 AER, *Guidance Note – Non-network ICT capex assessment approach for electricity distributors*, 28 November 2019.

100 Excluding $3.4 million capex for the operational technology cyber security program which is assigned to AER category 'Other non-network'.

101 SA Power Networks, *5.1.7 – Business cases to expenditure models reconciliation* – January 2024.

102 SA Power Networks, *5.12.1 – IT Investment Plan 2025-30* – January 2024, p. 7.

- meet new or altered compliance requirements
- enable new or expanded capability
- cyber security uplift.

The proposed capex is 17.9% lower than the actual/estimated ICT capex in the current regulatory period. The majority of the expenditure is being driven by:[103]

- the commencement of the next ICT 'investment cycle' including the investment to refresh an expanded portfolio with capabilities enabled over the last decade
- the ongoing system lifecycle changes where there is announced (or imminent) end to vendor support arrangements requiring SA Power Networks to act to ensure a secure and reliable service
- the ongoing role of data and digital interactions in the delivery of customer energy services
- an uplift of cyber security risk and the importance of cyber security to customers.

SA Power Networks has undertaken consumer engagement on its ICT program as a whole with relevant stakeholders and specifically engaged with customers on its non-recurrent expenditure to 'meet new or altered compliance requirements' and 'enabling new or expanded capabilities'.[104]

Table A.4 below outlines the list of SA Power Networks recurrent ICT projects. The focus of the proposed expenditure is on maintaining existing levels of service and risk through undertaking a periodic refresh, security patching, small upgrades and small enhancements to ICT asset classes. Although there is a slight decrease in proposed recurrent ICT capex, there is an increase in total recurrent ICT expenditure. The capex decrease is a reflection of capex being reclassified to opex. This is further discussed in Attachment 6 - opex.

Table A.4: recurrent ICT total expenditure projects ($ million 2024–25)

Project	Capex	Opex	Total
Client Device Refresh	37.2	-	**37.2**
Cyber Security Refresh	3.4	17.4	**20.8**
Data, Analytics and Intelligent Systems Refresh	13.8	3.2	**17.0**
IT Applications Refresh	72.7	16.3	**89.0**
IT Infrastructure Refresh	39.5	9.9	**49.4**
Network Uplift Resourcing – Ongoing IT	2.1	12.3	**14.4**
TOTAL	**168.7**	**59.1**	**227.8**

Source: SA Power Networks – *5.1.7 – Business cases to expenditure model reconciliation*, January 2024.
Note: Numbers may not add up due to rounding.

Table A.5 below lists SA Power Networks' non-recurrent ICT projects. The majority of these projects are classified as 'large upgrades and replacements', with the primary driver being end-of-life replacement, with a secondary driver for some projects being that the current

[103] SA Power Networks, *5.12.1 – IT Investment Plan 2025-30* – January 2024, pp 8–9.

[104] SA Power Networks, *5.12.1 – IT Investment Plan 2025-30* – January 2024, p. 43.

system is no longer fit for purpose. SA Power Networks has also proposed two projects classified as 'new or expanded capability' which it has justified with a positive NPV, and two projects classified as 'new compliance', which are required to enable SA Power Networks to meet new compliance requirements.

Table A.5: Non-recurrent ICT total expenditure projects ($ million 2024–25)

	Project	Capex	Opex	Total
Upgrade	Click Replacement	4.5	16.2	**20.7**
Upgrade	Enterprise Data Warehouse replacement	16.5	2.1	**18.5**
Upgrade	Integration Platform Replacement	15.1	-	**15.1**
Upgrade	Service Order System Replacement	24.0	-	**24.0**
Upgrade	SAP Module Lifecycle Management	14.3	1.2	**15.4**
Upgrade	Consolidate Customer Portals	3.2	11.0	**14.2**
Upgrade	Customer Notification System Replacement	11.8	-	**11.8**
Upgrade	Website Replacement	0.4	2.4	**2.8**
Upgrade	Meter Data Insights Replacement	0.5	2.0	**2.4**
Upgrade	CRM Replacement	3.6	10.6	**14.3**
New	Cyber Security uplift	3.0	47.6	**50.6**
New	New Self Services	1.4	8.3	**9.8**
New	Assets & Work Phase 3	34.9	11.4	**46.3**
Compliance	Legacy Metering Transition - Towards 2030	-	4.8	**4.8**
Compliance	ESB AEMO Post 2025 Roadmap Changes	2.4	-	**2.4**
	TOTAL	**135.5**	**117.6**	**253.1**

Source: SAPN – 5.1.7 – *Business cases to expenditure model reconciliation* – January 2024.
Note: Numbers may not add up due to rounding.

SA Power Networks has proposed two cyber security programs for the 2025–30 period, comprising a 'refresh' program and an 'uplift' program. The total proposed cyber security expenditure over the next period is $71.5 million in total expenditure, comprising $6.4 million in capex and $65.0 million in opex. The majority of the cyber security expenditure is opex in nature (see Attachment 6 - opex).

SA Power Networks proposed $3.4 million in capex to maintain the current level of cyber security[105] and $3.0 million in capex to implement a comprehensive cyber security uplift program related to improving its controls in order to reduce both the likelihood and consequence of cyber threats.[106]

105 SA Power Networks, *Business Case: ICT recurrent – Cyber Security Refresh* – January 2024, p. 6–7.

106 SA Power Networks, *Business Case: ICT non-recurrent – Cyber Security Uplift* – January 2024, p. 6–7.

In addition to the ICT cyber security forecast, SA Power Networks has also proposed $32.4 million to upgrade its Advanced Distribution Management System (ADMS) with the main driver being the need to upgrade this to respond to cyber security.

Customers were generally supportive of SA Power Networks' approach to cyber security and the desired security level, but were also cognisant of the cost of the programs.[107] In response to the draft proposal, some customers and SA Power Networks' Consumer Advisory Board members believed that any investment above the minimum regulatory obligations should be paid by SA Power Networks as part of balancing its own risk.[108]

SA Power Networks' forecast is based on compliance with the requirements of the *Security of Critical Infrastructure Act* (SOCI Act), the Australian Energy Sector Cyber Security Framework (AESCSF), and a risk-based approach to managing the increasing cyber security threat level and number of systems susceptible to hacking. SA Power Networks adopted a risk-based approach as the preferred strategy in developing the forecast.

The preferred investment option was selected because it represents the most efficient option considered with benefits outweighing costs and delivers what SA Power Networks considered was a prudent reduction in cyber security risk to an acceptable level. This incorporated appropriate practices from both the AESCSF and other relevant cyber security frameworks.

A.4.3 Reasons for the decision

We have reviewed the information SA Power Networks provided in support of its proposed ICT capex. We engaged EMCa to review the prudency and efficiency of the proposed capex and related opex for the proposed non-recurrent ICT and cyber security. EMCa based its review on SA Power Networks satisfying the key aspects of our ICT assessment guideline note.[109] Where required, we sought further information from SA Power Networks through information requests.

SA Power Networks' ICT plan identifies $528.6 million in economic benefits forecast to be delivered by its ICT program over 2025–35, with $126.9 million forecast to be delivered over the 2025–30 regulatory control period.[110] The majority of the benefits over 2025–35 are non-financial; being risk monetisation ($272.8 million), avoided cost ($139.1 million) and customer time value ($10.7 million).[111] Realisable financial benefits, being cost savings, total $45.0 million for the 2025–30 regulatory control period and are being realised through the 'asset and works phase 3 project'.[112] Our expectation is that SA Power Networks should continue to develop ways to demonstrate efficiency gains and value from ICT for customers, and demonstrate this in the next regulatory control period.

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107 SA Power Networks, *IT Investment Plan 2025-30* – January 2024, pp 43–45.

108 SA Power Networks, *0.1 – Community Advisory Board Independent Report*, November 2023, p. 38.

109 AER, *Guidance Note – Non-network ICT capex assessment approach for electricity distributors*, 28 November 2019.

110 SA Power Networks, *IT Investment Plan 2025-30* – January 2024, Table 12.

111 SA Power Networks, *IT Investment Plan 2025-30* – January 2024, Table 11.

112 SA Power Networks' asset and works project is a discretionary project primarily driven by producing a net benefit through labour efficiencies in delivering its distribution network program of work. $45.0 million in cost savings is identified in the business case, which is recognised in SA Power Networks' proposal as an efficiency dividend against its network capex forecast for repex, augex and CER.

Our assessment has focussed on the non-recurrent ICT programs by having regard to the expectations and good industry practices set out in our ICT Guidance Note. We found that SA Power Networks' approach to forecasting recurrent ICT to be reasonable and note that the proposed recurrent capex is expected to decline in the 2035–30 period. This is predominately due to changes in the accounting treatment of software as a service and cloud computing implementation costs being now treated as opex instead of capex as it was treated historically.

We have reviewed this reclassification and are satisfied that it has been correctly applied. This is discussed further in Attachment 6 – opex. The remaining proposed recurrent ICT capex is mainly replacement of ICT assets to maintain services and risk levels.

Our primary focus has been on the assessment of non-recurrent ICT and cyber security, which is discussed further in the following sections.

A.4.3.1 Non- recurrent ICT

We found that SA Power Networks provided sufficient evidence demonstrating that the non-recurrent ICT expenditure was prudent and aligned with our ICT Guidance Note.[113] This included vendor advice on the cessation of support which would result in a high or extreme risk to the delivery of services by the end of the next period.

Further, EMCa found that SA Power Networks presented credible and viable options with the business cases and that SA Power Networks had selected the option that provided the highest NPV which is aligned with our ICT Guideline Note. SA Power Networks also identified options that were not considered credible and why.[114]

We are also satisfied that there is sufficient evidence that SA Power Networks has undertaken a robust approach in preparing its forecast ICT, including:[115]

- providing detailed bottom-up forecasts for every project, typically based on one or more of:
  - vendor budget quotes (but not tendered prices)
  - leveraging off relevant historical costs
  - third party input (i.e. consultants) either to shaping the scope or the cost or both.
- evidence of a top-down challenge[116]
- evidence of appropriate timing for the projects
- benchmarking showing its costs are reasonable compared to other DNSPs[117]
- demonstrated that forecasts do not include contingency amounts[118]

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113 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, p. 102.

114 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, p. 102.

115 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, p. 103.

116 SA Power Networks, *Response to AER IR#018. Question 34*, 7 June 2024.

117 SA Power Networks, *Response to AER IR#018. Question 35*, 7 June 2024.

118 SA Power Networks, *Response to AER IR#018. Question 37*, 7 June 2024.

- demonstrated assumptions around benefits to be reasonable[119]
- demonstrated costs to be reasonable.[120]

However, EMCa identified two compliance projects that are not yet compliance requirements (and have too much uncertainty around when they will become requirements).[121] These include the following projects:

- Energy Security Board AEMO post 2025 market changes ($2.4 million in capex)
- legacy metering transition.

SA Power Networks has proposed that the Energy Security Board AEMO Post 2025 Market Changes proposed expenditure be used as a placeholder and it will provide further certainty in the revised proposal.[122] We support this and have included $2.4 million as a placeholder for this project. We expect SA Power Networks to demonstrate in the revised proposal that this project has become a compliance requirement and is necessary for inclusion in the forecast capex.

SA Power Networks in its initial proposal did not put forward a need for capex for the legacy metering transition. However, in response to an information request in late July,[123] SA Power Networks submitted new forecasts that identified the need for capex for this program. We consider this new information and should be included in the revised proposal. It will also be necessary for SA Power Networks to demonstrate that it is a compliance requirement for inclusion in the forecast capex.

We consider SA Power Networks' proposed non-recurrent ICT capex is appropriate given a significant amount of the ICT programs will reach end of life (with no vendor ongoing support) and SA Power Networks has put forward robust analysis demonstrating the preferred replacement options are prudent and efficient.

A.4.3.2 Cyber Security

We consider SA Power Networks' proposed cyber security ICT capex to be prudent and efficient. SA Power Networks provided sufficient information that demonstrated the level of cyber security risks it faces and that the proposed programs would address this risk appropriately.

We engaged EMCa to assess the prudency and efficiency of the cyber security proposal for capex and related opex. We also engaged EMCa to review SA Power Networks' proposed ADMS upgrade as part of the cyber security assessment. EMCa took into consideration SA Power Networks understanding of its risks and proposed controls to manage the cyber security risk it faced.

EMCa found that SA Power Networks has demonstrated it is facing an increasing cyber security profile and that it is prudent to invest to address this risk. Further, EMCa is of the

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119 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, p. 103.

120 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, p. 103.

121 EMCa, *Review of Aspects of Proposed Expenditure,* August 2024, pp. 104–105.

122 SA Power Networks, *5.12.1 - IT investment Plan 2025-30* – January 2024, p. 59.

123 SA Power Networks, *Response to AER IR#027*, 10 July 2024.

view that SA Power Networks has provided sufficient evidence to justify the level of expenditure for both the cyber refresh and uplift programs. This included a detailed transparent gap analysis that clearly identified the risks and necessary controls to manage the risk.

We are satisfied that cost estimates and benefits (particularly for the uplift) were developed in a robust top-down and bottom up manner. EMCa considered the costs and benefits to be reasonable.[124]

We also consider that the proposed ADMS upgrade was prudent and efficient. The vendor has indicated that the current version of ADMS will no longer be supported in 2027. SA Power Networks has identified that there is a cyber security risk once the current system will no longer be supported. We are of the view that the proposed option and associated costs of the ADMS upgrade are justified.

A.5 Consumer Energy Resources

CER integration includes solar photovoltaic systems (PV), energy storage devices, electric vehicles and other consumer appliances that are capable of responding to demand or pricing signals. Increasing CER represents a change in the way that consumers interact with electricity networks and the demands that are placed on networks.

CER expenditure enables SA Power Networks to accommodate more rooftop solar on the network. This allows more customers to connect their rooftop solar and export more of the electricity they generate back to the grid. CER integration capex includes:

- augmenting the network to physically provide greater PV export capacity
- ICT capex to develop greater visibility of the low-voltage network and manage changes being driven by technological developments.

A.5.1 AER's draft decision

We are satisfied that SA Power Networks' capex forecast of $90.7 million to integrate CER reasonably reflects the capex criteria, and have included this amount in our alternative estimate of total capex.

A.5.2 SA Power Networks' proposal

SA Power Networks' CER integration strategy is to manage the changing role of the distribution network through an efficient combination of price signals (tariffs), non-network solutions to shift and shape loads and targeted investments in network capacity to maintain export service performance. The primary goal is to ensure that it continues to meet customer demand for the export service through the 2025–30 period.[125] SA Power Networks proposed the following initiatives related to CER integration, each with separate business cases:

- CER integration ($70.1 million). This program will increase network hosting capacity by addressing low voltage network constraints, and continue the implementation of flexible exports. SA Power Networks submitted that these activities would maintain a 95% export service level for 95% of customers (that is, customers will not experience export

124 EMCa, *Review of Cyber Security and AMDS Expenditure Forecast,* August 2024, p. 25.

125 SA Power Networks, *5.7.15 – CER integration strategy* – January 2024.

curtailment for more than 5% of solar hours during the year). SA Power Networks also proposed an opex step change of $4.4 million

- CER compliance ($5.7 million). SA Power Networks currently has a program which identifies new CER installations that are not compliant with technical standards. This expenditure will extend this program to the detection of existing installations that are non-compliant. SA Power Networks also proposed an opex step change of $2.5 million
- network visibility ($9.1 million). SA Power Networks plans to increase network visibility by acquiring and processing smart meter data. This will assist it with operational, safety, CER integration and network planning functions. SA Power Networks also proposed an opex step change of $6.8 million
- demand flexibility ($7.7 million). This program will develop flexible load connections and new customer services and operational capabilities to help customers activate smart devices, such as home batteries and EV chargers.

SA Power Networks submitted that these initiatives are intended to work together as a package to meet and manage demand for the export service. For example, its modelling considers the impact of tariffs and non-network solutions prior to forecasting distribution transformer upgrades, and only incremental benefits associated with avoided export curtailment are estimated.

SA Power Networks stated that each of its initiatives will provide customers with net benefits. These benefits include avoided dispatch costs, avoided generation investment costs and the terminal value of new capital assets (for CER integration), reductions in frequency control ancillary service costs (for CER compliance) and unserved energy (for demand flexibility), as well as safety benefits (for network visibility).

For its CER integration program, SA Power Networks also considered investment options which would deliver a 90% and 98% service level (both for 95% of customers), but selected its preferred investment option (a 95% service level) because:

- it best reflects the level of export service performance that its customers are willing to pay for, based on Focused Conversation workshop voting, People’s Panel endorsements and alignment with its Customer Values Research survey; and
- it provides the highest positive market benefits of the options considered.

SA Power Networks did not consider an option which maximises market benefits to be credible, as it was the least popular option among stakeholders in its Focused Conversation workshops even though it had a lower level of investment, and hence lower estimated bill impact, than other options considered.

A key reason for this was that stakeholders took into consideration SA Power Networks’ intention to recover the costs of these investments from export customers only, via export tariffs. Stakeholders also placed a high value on the principles of fairness and equity and felt strongly that SA Power Networks should, within the bounds of practicality, seek to provide all export customers with broadly the same level of service performance, since all export customers pay for the investments in export capacity.

SA Power Networks’ estimate of export long run marginal cost is the basis for its proposed export tariffs, and includes its forecast capex and opex related to its CER integration and compliance programs, as well as some capex related to network visibility.

A.5.3 Reasons for the decision

We reviewed SA Power Networks' CER integration strategy, respective business cases and its supporting NPV analysis, which it provided in response to our information request.[126] Our assessment was informed by both our CER strategy[127,] and distribution energy resources integration expenditure guidance note.[128] Key to our assessment was understanding whether SA Power Networks reasonably estimated customer benefits in its NPV analysis, and for its CER integration program, the extent that the potential investment options were supported by customers. We also considered stakeholder submissions on SA Power Networks' proposal.

SA Power Networks' approach to CER integration is relatively unique, in that the proposed expenditure is targeted at maintaining a particular service level rather than maximising net economic benefits. We note that, unlike the consumption service, there is not a mandatory incentive scheme in place for the export service and guaranteed service levels are not defined. Therefore, if SA Power Networks does not deliver its proposed service level it will not face any financial penalties. Under existing incentive arrangements, there is also a risk that SA Power Networks will minimise capex and opex and prioritise the delivery of the consumption service. We are committed to revisiting these issues in a future review of incentive arrangements for export services.[129]

However, we also recognise that SA Power Networks' customer engagement revealed strong support for it maintaining a high level of export service, on the condition that the costs of these investments would be recovered from export customers only, via export tariffs.

For its CER integration program, SA Power Networks' preferred investment option results in an NPV of $18.9 million. We conducted a sensitivity analysis on SA Power Networks' business case and consider that this estimate is slightly overstated because:

- benefits were quantified over an analysis period of 25 years. We consider an analysis period of 20 years is more appropriate
- the value of avoided export curtailment has decreased, based on analysis of the AER's 2024 customer export curtailment values (CECVs) compared with the 2023 CECVs applied in the analysis; and
- although its approach to estimating avoided generation investment costs is valid, the 2024 Integrated System Plan forecasts a lower level of investment in utility scale solar generation capacity. This means there is likely to be less investment avoided when rooftop solar exports are alleviated.

However, SA Power Networks did not quantify emissions reduction benefits. We found that, if these were quantified (using the forecast emissions intensity of electricity generation in South Australia and the published interim values of emissions reduction), the proposed investments will provide net benefits to customers.

Stakeholders were largely supportive of this aspect of SA Power Networks' capex proposal. The Clean Energy Council supported targeting a 98% export service level, but conceded it

126 SA Power Networks, *Response to IR#024, Q3*, June 2024.

127 AER, *Consumer energy resources strategy*, April 2023.

128 AER, *Distributed energy resources integration expenditure guidance note*, June 2022.

129 AER, *Incentivising and measuring export services performance*, March 2023.

may not be the optimal balance of costs and customer desires.[130] The Smart Energy Council supported the introduction of bi-directional network tariffs as a commitment to equity in cost recovery methods by recovering costs only from exporting customers.[131] Both SACOSS and the CAB Reset Subcommittee highlighted the risk that costs would be inequitably passed on to renters and vulnerable customers.[132] We consider that non-export customers do benefit from lower electricity prices over time as more electricity from rooftop solar is displacing more costly centralised electricity generation.

We consider that SA Power Networks' capex forecast reasonably reflects the capex criteria because:

- although it does not seek to maximise net customer benefits, the target export service level reflects the outcome of its customer engagement
- based on our analysis, the proposed investments will provide net customer benefits
- the investments will not lead to inequitable outcomes as costs will be recovered solely from export customers; and
- the proposed non-network activities are reflective of a sound overall CER integration strategy, which will increase the utilisation of existing capacity.

We also consider it appropriate that SA Power Networks reports on its export service level performance. This will place a reputational incentive on SA Power Networks to efficiently invest in the export service and provide its customers with transparency. New customers are already able to view the historical indicative export capacity available in its local area under a flexible connection offer.[133] However, SA Power Networks should report on its export service performance more prominently, either on its website or in its Distribution Annual Planning Report. In addition, our export services network performance report also includes related export curtailment metrics and expenditure incurred to provide export services.[134]

Finally, we note that export service levels beyond 2030 will not be defined by this decision, and remain uncertain. This issue will be revisited in the future, taking into account customer preferences, the impact of export tariffs and potentially new incentive arrangements for export services.

Our decision on the proposed CER opex step changes are provided in Attachment 6 - opex.

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130 Clean Energy Council, *Submission – 2025-30 Electricity Determination – SA Power Networks*, May 2024.

131 Smart Energy Council, *Submission – 2025-30 Electricity Determination – SA Power Networks*, May 2024.

132 SACOSS, *Submission – 2025-30 Electricity Determination – SA Power Networks*, May 2024; CAB Reset Subcommittee, *Submission – 2025-30 Electricity Determination – SA Power Networks*, May 2024.

133 SA Power Networks, *Flexible Exports Eligibility*, accessed 22 August 2024.

134 AER, *Export services network performance report 2023*, December 2023.

Shortened forms

Term	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulatory
capex	capital expenditure
CCP30	Consumer Challenge Panel, sub-panel 30
CER	customer energy resources
DNSP or distributor	Distribution Network Service Provider
ESCOSA	Essential Services Commission of South Australia
EV	electric vehicle
HV	high voltage
kV	kilovolts
ICT	information and communication technology
NEL	National Electricity Laws
NEO	National Electricity Objectives
NER	National Electricity Rules
NPV	net present value
NSP	Network Service Provider
opex	operating expenditure
RAB	regulated asset base
repex	replacement expenditure
SAIDI	system average interruption duration index
SAIFI	system average interruption frequency index
SCS	standard control service
USAIDI	unplanned SAIDI