Draft Decision

Evoenergy Electricity Distribution Determination 2024 to 2029

(1 July 2024 to 30 June 2029)

Attachment 5
Capital Expenditure

September 2023

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601
Tel: 1300 585 165

AER reference: AER212496

Amendment record

Version	Date	Pages
1	28 September 2023	39

Contents

5 Capital expenditure

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, and to maintain the safety, reliability, quality, and security of its network (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 and cost inputs (the capex criteria).[3] We must make our decision in a manner that will, or is likely to, deliver efficient outcomes that benefit consumers in the long term (as required under the National Electricity Objective (NEO)).[4]

The *AER's capital expenditure assessment outline* explains our and distributors' obligations regarding capex 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.

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 and is referred to as the 'capex bucket'.

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-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 revenue determination. Distributors also may not need to complete some of the programs

---

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.

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[6]
- *Regulatory Investment Test for Distribution and Transmission (RIT-D and RIT-T) Guidelines*[7]
- AER's *Asset Replacement Industry Note*[8]
- *AER's Information and Communication Technologies (ICT) Guidance Note*.[9]

We also had regard to the guiding principles in the AER's *Better Resets Handbook – Towards consumer centric proposals* which encourages networks to develop high quality, well-justified proposals that genuinely reflect consumers' preferences.[10]

Our draft 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.

5.1 Draft decision

Our draft decision is that we are not satisfied that Evoenergy's proposed total forecast capex of $520.8 million ($2023–24) reasonably reflects the capex criteria. Our substitute forecast is $416.3 million, which is 20% below Evoenergy's forecast.

We consider this forecast will provide for a prudent and efficient service provider in Evoenergy's circumstances to maintain the safety, reliability and security of electricity supply on the distribution network. Table 5.1 outlines our substitute estimate of forecast capex and compares this to Evoenergy's proposed forecast capex.

---

6 AER, *Expenditure Forecast Assessment Guideline for Distribution*, August 2022. The legal requirements of the AER under the NEL and the NER in assessing capex are outlined in section 2.1.

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

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

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

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

Table 5.1 AER's draft decision on Evoenergy's total net capex forecast ($ million, $2023–24)

	2024–25	2025–26	2026–27	2027–28	2028–29	Total
Evoenergy's proposal	88.0	90.2	100.9	115.0	126.7	520.8
AER's draft decision	83.9	85.0	88.3	81.9	77.2	416.3
Difference ($)	-4.1	-5.2	-12.6	-33.1	-49.5	-104.5
Difference (%)	-4.7%	-5.8%	-12.5%	-28.8%	-39.1%	-20.1%

Source: AER analysis and Evoenergy's proposal.

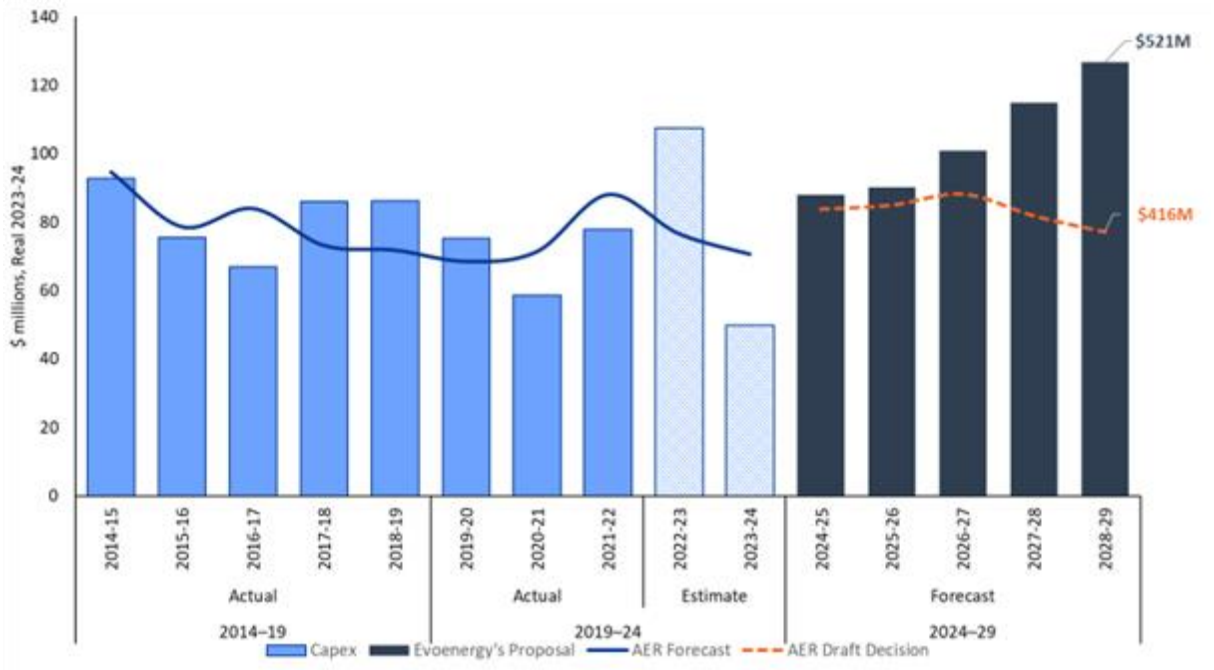
Note: Numbers may not add up due to rounding. Modelling adjustments relate to updates to the consumer price index (CPI) and real cost escalation assumptions.

5.2 Evoenergy's proposal

Evoenergy's proposal forecasts $520.8 million ($2023–24) capex over the 2024–29 regulatory control period. This represents an increase of approximately 51% compared to actual and expected expenditure over the 2019–24 period.

Figure 5.1 outlines Evoenergy's historical capex trend, its proposed forecast for the 2024–29 regulatory control period, and our draft decision.

Figure 5.1 Evoenergy's historical and forecast capex ($ million, $2023–24)



Source: AER analysis.

Evoenergy estimates that its actual capex in the current 2019–24 regulatory period will be $7 million (or 2%) lower than its capex forecast.[11] Figure 5.1 above shows Evoenergy expects to

[11] Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), p. 5.

underspend against our forecast in three years (2020–21, 2021–22 and 2023–24) and overspend in two years (2019–20 and 2022–23).[12]

Over five years variances will typically arise between a networks' forecast and actual capex, particularly at a category level. Evoenergy forecasts that actual gross connections capex ($164 million) will be higher than forecast ($124 million) because of a significant forecast increase in connections works in 2022–23 and 2023–24.[13] Evoenergy also estimates that its total non-network capex for the current regulatory period will be $25 million or 38% higher than the forecast.[14] This is because property and other non-network capex costs have been adversely affected by increased construction and IT costs during the period.[15] Capex categories where Evoenergy expects to underspend its forecast include replacement expenditure (by $12.1 million or 11%) and augmentation expenditure (by $6.1 million or 10%).[16]

The significant increase in Evoenergy's capex forecast compared to the 2019–-24 regulatory control period is primarily due to an increase in forecast augmentation expenditure of $133 million or 274%. This is evident in the later years of the 2024–29 regulatory control period as shown in figure 5.1 above.

This increase in augmentation is due to an increase in forecast demand, driven in part by the ACT Government's policy on achieving a net zero emission target by 2045. This represents a significant shift towards electrification and is most prevalent in the demand for electric vehicle (EV) charging services. Evoenergy has proposed a number of zone substation and low voltage feeder upgrade programs to meet the forecast increases in demand across the ACT.

In addition, Evoenergy is also proposing a 24% uplift in its forecast replacement expenditure to address reliability performance and the aging of its network assets.

Table 5.2 provides a breakdown of Evoenergy's capex proposal in more detail.

12 Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), p. 6.

13 Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), pp. 10–11.

14 Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), p. 13.

15 Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), p. 15.

16 Evoenergy, *Evoenergy-Appendix 1.1 2019–24 period capital expenditure,* January 2023 (Public), p. 6.

Table 5.2 Evoenergy's forecast capex categories verses current period actual/estimates ($ million 2023–24)

Category	Evoenergy 2019–24 capex	Evoenergy 2024–29 capex	Change from 2019–24 (%)	Proportion of total capex
Augmentation	48.6	181.6	273.6%	31.4%
Replacement	95.0	117.6	23.8%	20.4%
Connections	168.5	122.5	-27.3%	21.2%
Property	21.9	2.9	-86.6%	0.5%
ICT	34.7	39.0	12.4%	6.8%
Fleet	12.5	13.8	10.5%	2.4%
Non-network capex - other	16.2	12.3	-24.1%	2.1%
Capitalised overheads	82.8	87.6	5.8%	15.2%
Gross Total	**480.4**	**577.5**	**20.2%**	
Customer contribution connections	130.5	52.6	-59.7%	
Disposals	4.2	4.15	-0.2%	
Net Total	**345.7**	**520.8**	**50.6%**	

Source: AER analysis.

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

5.3 Reasons for draft decision

We reviewed Evoenergy's 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 Evoenergy's 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 area's such as electrification and CER. 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. 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 Evoenergy has performed against the Better Resets Handbook expectations for capex.[17]

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

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

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.	Evoenergy has not met this expectation as the total capex is 50% above the historical expenditure. Most of the increase in the expenditure is driven by the ACT Government policy on achieving the net zero emission target by 2045.
Evidence of prudent and efficient decision-making on key projects and programs.	Evoenergy has broadly met this expectation. However, there is insufficient data provided and a clear justification for Evoenergy's proposed replacement expenditure and the demand forecast that forms the basis for the increase in augmentation expenditure.
Evidence of alignment with asset and risk management standards.	Evoenergy has met this expectation. Evoenergy has provided detailed information on its planning and asset management practices which is largely consistent with good industry practices.
Genuine consumer engagement on capital expenditure proposals.	Evoenergy has met this expectation. Stakeholder submissions indicated that overall, the consumer engagement was conducted well.

While we have not accepted Evoenergy's total capex forecast, we are broadly supportive of Evoenergy's forecasting approach. However, we have identified two key components of Evoenergy's forecast – augmentation and replacement expenditure – that are not prudently required to maintain the safety, reliability or security of the network, or reflect the efficient costs of doing so.

As augmentation expenditure is largely driven by demand, the effective management of a customer's electricity consumption is an important consideration. How much electricity is consumed and when it is consumed, impacts on the network's capacity to deliver services, particularly at peak times. Network tariffs can be used to facilitate retail tariffs that encourage customers to reduce individual peak demand, resulting in reduced network augmentation needs and long-term costs to all consumers.

We support Evoenergy's proposed tariffs which include elements to charging EVs outside network peak demand periods. However, we consider Evoenergy should do more to address the increasing EV charging demand as it emerges in the 2024–29 period. We require Evoenergy to investigate controlled load tariffs as an additional option to alleviate the need for augmentation expenditure. Our response to Evoenergy's proposed tariffs is discussed further in attachment 19 – tariff structure statement.

Table 5.4 sets out our draft decision for Evoenergy by capex category.

Table 5.4 AER draft decision by capex category ($million 2023–24)

Category	Evoenergy proposal	AER draft decision	Difference ($)	Difference (%)
Augmentation	181.6	103.9	-77.7	-42.8%
Replacement	117.6	94.4	-23.2	-19.7%
Connections	122.5	122.5	-	-
Property	2.9	2.9	-	-
ICT	39.0	39.0	-	-
Fleet	13.8	13.8	-	-
Non-network capex - other	12.3	12.3	-	-
Capitalised overheads	87.6	81.6	-6.1	-6.9%
Gross Total	**577.5**	**470.6**	**-107.0**	**-18.5%**
Less Customer contribution connections	52.6	54.2	1.6	3.0%
Less Disposals	4.2	4.2	-	-
Modelling adjustments		4.1	4.1	
Net Total	**520.8**	**416.3**	**-104.5**	**-20.1%**

Source: Evoenergy's 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 (including the exclusion of external contract labour cost escalation).

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 that we have not accepted for the draft decision are contained in Appendices A.1 to A.3.

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
Augmentation	We have **not** included Evoenergy's augmentation expenditure in the total forecast capex. Evoenergy proposed $181.6 million ($2023–24) for augmentation capex. Our draft decision is to include $104.6 million for augmentation capex. This is $77.7 million or 43% less than what Evoenergy proposed. Most of the reduction is demand driven and concerns EV demand related projects that are largely deferred because the network will be able to accommodate the current projected level of demand from EVs over the 2024–29 regulatory control period. We have determined a lower demand forecast than proposed by Evoenergy and require Evoenergy to update its forecasting approach and modelling inputs. This will also take into account more recent data, including the ACT Government's updated position on its integrated energy plan and the CSIRO's forecast on EV charging profiles. Our lower alternative demand forecast has the effect of reducing the augmentation capex by deferring projects to future regulatory control periods. However, we anticipate that the demand forecast will change from the draft decision and this will have an impact on Evoenergy's proposed augmentation expenditure for its revised proposal. Our reasons for this are set out in Appendices A.1 (Demand) and A.2 (Augmentation).
Replacement	We have **not** included Evoenergy's replacement expenditure in the total forecast capex. Evoenergy proposed $117.6 million ($2023–24) for replacement capex. Our draft decision is to include $94.4 million for replacement capex. This is $23.2 million or 20% less than what Evoenergy proposed. We consider Evoenergy has not sufficiently demonstrated the need for an uplift in replacement expenditure above the historical trend. This reduction brings Evoenergy's expenditure in line with its historic average levels. Our reasons for this are set out in Appendix A.3.
Connections	We have included Evoenergy's connections forecast in the total forecast capex. Evoenergy proposed $122.5 million in connections. This is 27% less than the $168.5 million actual and estimated connections for the current period. Evoenergy had a large one-off connection project that resulted in higher than usual expenditure. However, taking this into account, the forecast expenditure is not materially different from historic expenditure and aligns with ACT housing growth expectations. We consider the proposed connection expenditure is reasonable.
Property	We have included Evoenergy's proposed property forecast in the total forecast capex. Evoenergy proposed $2.9 million for property capex. Evoenergy's property capex is largely for on-going maintenance and a significant step down from the $21.9 million actual and estimated expenditure for the current period. Given the size and nature of the property capex, we consider the proposed expenditure is reasonable.
ICT	We have included Evoenergy's proposed ICT forecast in the total forecast capex. Evoenergy's proposed ICT expenditure is largely in line with actual or estimated expenditure for the current period and over 40% of the proposed expenditure is recurrent in nature. Evoenergy has not proposed any capital expenditure related cybersecurity expenditure but rather an opex step change of $14.6 million which we accepted as a placeholder and is discussed further in attachment 6 – opex. On this basis, we consider Evoenergy's ICT capex is reasonable.

Issue	Findings and reasons
Fleet	We have included Evoenergy's proposed fleet forecast in the total forecast capex. Evoenergy's proposed capex fleet expenditure of $13.8 million is comparable to its actual or estimated expenditure of $12.5 million for the current period. Evoenergy's vehicle replacement criteria are also in line with other Australian energy network businesses. On this basis, we consider the proposed fleet expenditure is reasonable.
Other Non-network capex, including spares	We have included Evoenergy's other non-network capex forecast in the total forecast capex. Evoenergy proposed $12.3 million in other non-network expenditure which is significantly lower than the actual and estimated capex of $16.2 million for the current period. This category includes corporate services business support such as its non-system assets program and equipment. We consider Evoenergy's proposed expenditure on other non-network expenditure is reasonable.
Capitalised overheads	We have included $81.6 million of Evoenergy's capitalised overheads in the total forecast capex. This is $6.1 million (or 7%) less than the $87.6 million in capitalised overheads proposed by Evoenergy. 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. Evoenergy have applied the AER's direct cost approach to capitalised overheads without adjustments and the forecast aligns with our expectations given the proposed capex expenditure program. On this basis, we consider Evoenergy's proposed capitalised overheads expenditure is reasonable.
Customer contributions	We have included Evoenergy's customer contribution forecast in the total forecast capex. Evoenergy proposed $52.6 million in customer contributions. The customer connections are based on the established connections policy and aligns with proposed connections expenditure and for this reason we consider to be reasonable.
Contingent project	We have **not** accepted Evoenergy's proposed contingent project. Evoenergy has proposed a contingent project that would be triggered where evidence emerges that the speed of the energy transition, in particular the uptake of EVs and electrification, is greater than assumed in the capex forecasts put forward in its regulatory proposal, where this requires Evoenergy to undertake a material program of works during the next regulatory period. We consider Evoenergy's proposed program of substation and feeder works contingent project should not be classified as a contingent project for the 2024–29 regulatory control period. We consider the triggers are either too broad, not specifically clear and lack sufficient detail, including network specific locations, and require further justification. For this reason, we do not consider this project may be reasonably required to be undertaken to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for distribution services over the 2024–29 period. Evoenergy informed us that it is proposing to resubmit a new contingent project in the revised proposal and is considering a specific load driven contingent project to upgrade the Mitchell zone substation with an estimated cost of at least $50 million. Our reasons for this are set out in Appendix B.
Disposals	We have included Evoenergy's asset disposal forecast in the total forecast capex.

Issue	Findings and reasons
Ex post review	Evoenergy incurred $4.3 million ($nominal) of capex above its forecast regulatory allowance for the ex post review period. We are satisfied that Evoenergy's capex in the 2017–18 to 2021–22 regulatory years should be rolled into the regulatory asset base. Our ex-post review is set out in Appendix C.

A Reasons for decision on key capex categories

This appendix sets out our assessment of key capex categories and programs/projects within Evoenergy's total capex forecast that we have not included in our alternative estimate and the reasons for our decision. This appendix includes:

- Demand forecast (A.1)
- Augmentation (A.2)
- Replacement (A.3).

A.1 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.[18] Reasonable demand forecasts based on the most current information are important inputs to ensuring efficient levels of investment in the network.

A.1.1 AER's draft decision

We are not satisfied with Evoenergy's proposed demand forecast and have substituted a lower demand forecast at both the system wide and zone substation levels. This reduction is driven by our alternative estimates for both Electric Vehicles (EV) and non-EV block loads.[19] Non-EV block loads include residential and commercial loads forecast for homes, offices, and other large development projects such as supermarkets, hospitals and data centres.

Our alternative demand forecast for the 2024–29 regulatory control period is:

- 38 MVA[20] for system wide peak demand growth, which is 44% lower than Evoenergy's proposed demand forecast of 68 MVA
- 43 MVA for zone substation demand growth, which is 70% lower than Evoenergy's proposed demand forecast of 140 MVA.

Figures A.1 and A.2 show a comparison of historical actual maximum demand at the system wide and zone substation levels with Evoenergy's proposed forecast and our alternative forecast.

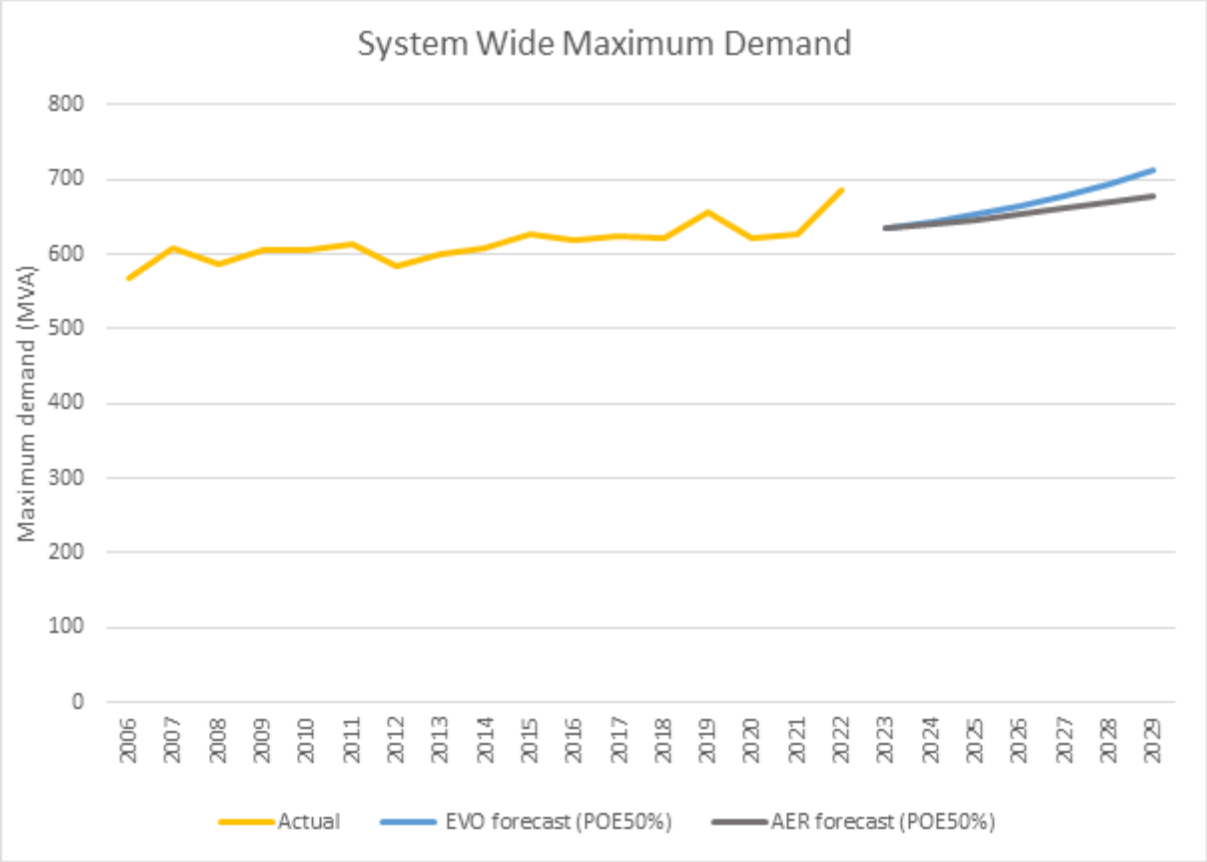
---

18 NER, cll. 6.5.6(c)(3) and 6.5.7(c)(1)(iii).

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

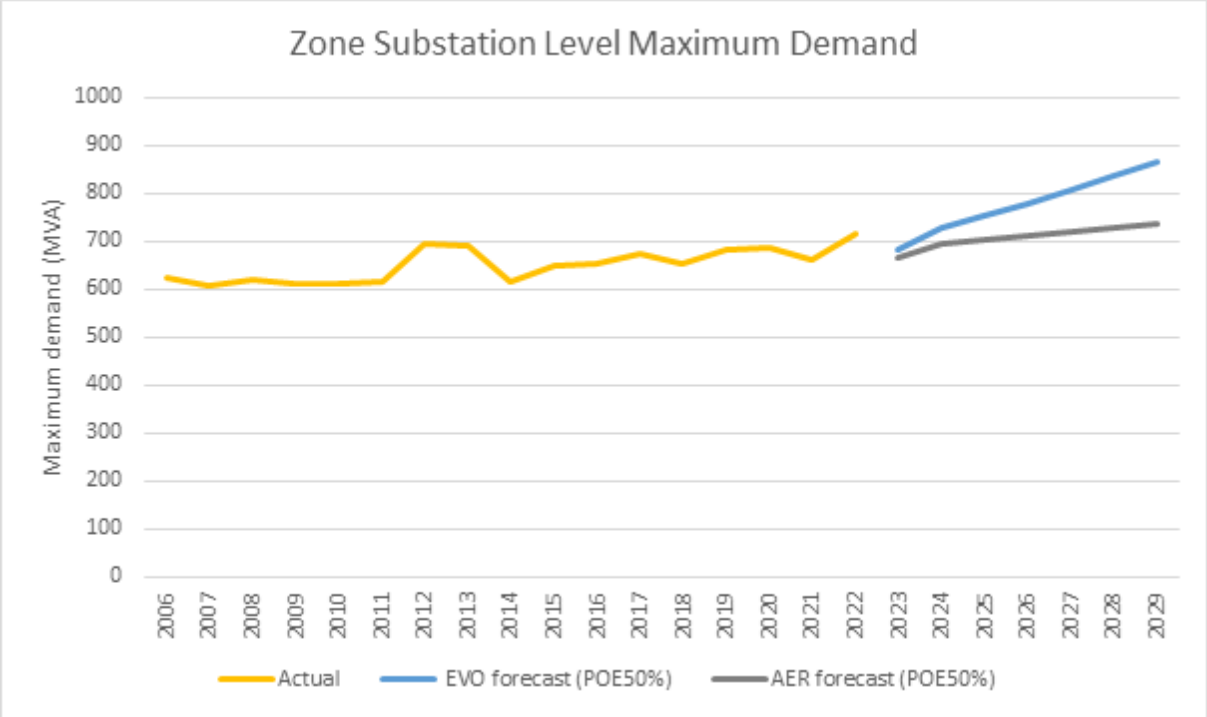
20 Megavolt amperes (MVA) is the product of megawatts (MW) and the power factor. Evoenergy has assumed a power factor of 1, which means MVA is the same as MW for the purposes of this draft decision.

Figure A.1 Comparison of Evoenergy's demand at the system wide level – historical actual, Evoenergy forecast and AER alternative forecast



Source: AER analysis

Figure A.2 Comparison of Evoenergy's demand at the zone substation level – historical actual, Evoenergy forecast and AER alternative forecast



Source: AER analysis

Having reviewed Evoenergy's demand forecasts, we have concerns with the forecasting approach and input assumptions applied in various areas of Evoenergy's modelling. We require Evoenergy to refine the forecasting approach and the modelling inputs to address our concerns in its revised proposal. Evoenergy is also proposing to update its demand forecast to align with the ACT Government's updated position on its integrated energy plan[21] and consider the latest CSIRO forecast on EV charging profiles.[22] Additionally, Evoenergy should better address the gas transition as part of its move to electrification and explain how this has been considered in its revised proposal.

Given the need to update the demand forecast to take into account further information regarding the impact of EVs in the ACT and our concerns with the forecasting approach, our alternative demand estimates in this draft decision should be regarded as a placeholder rather than a realistic expectation of the demand forecast at this stage of the review process.

Our lower alternative demand forecast has the effect of reducing the augmentation capital expenditure by deferring a number of substation and low voltage feeder projects that Evoenergy is proposing for late in the 2024–29 regulatory control period to future regulatory control periods. The impact on augmentation capital expenditure is discussed in more detail in Appendix A.2.

A.1.2 Evoenergy's proposal

Evoenergy proposed a significant uplift in demand which is driving a substantial increase in its augmentation capital expenditure for the 2024–29 regulatory control period, and of which, 90% is demand-driven.

Evoenergy is forecasting 68 MVA of system wide peak demand and 140 MVA at the zone substation level over the regulatory control period.[23] Evoenergy states the forecast demand increase is being driven by a combination of factors, including:

- the forecast increase in EV uptake as a result of the ACT Government's climate change policy and the related decline in the gas network including the legislated target of net zero carbon emissions by 2045 through electrification
- the projected growth in the trend and block loads for traditional load growth such as government, business and residential development.[24]

Evoenergy has modelled EV driven peak demand separately and added this as a block load since there is no historic data available on the uptake of EVs. The key information that Evoenergy has relied upon to forecast EV peak demand for its regulatory proposal is:[25]

---

21 ACT Government, *Canberra is electrifying: Towards a net zero emissions city, ACT Government Position Paper*, August 2023.

22 CSIRO, *Electric vehicle projections 2022, commissioned for AEMO's draft 2023 Input, Assumptions and Scenarios Report,* November 2022.

23 AER's analysis based on; Evoenergy, *Response to IR#014*, 19 April 2023.

24 Evoenergy, *Evoenergy-Appendix 1.16 Network Development Plan-January 2023_Public,* p. 25.

25 Evoenergy, *Response to IR007-Appendix 2-Briefing note: EV block load forecast 20230426-Confidential*, 26 April 2023, p. 4.

- Deloitte Access Economics' Zero Emission Vehicle Charge Rollout report commissioned by the ACT Government that forecasts passenger EV uptake, energy consumption and location by suburbs
- Evoenergy's net zero model developed in partnership with Marsden Jacobs Associates that quantifies the impacts of emission reduction targets and policies on ActewAGL, customers, and other key stakeholders[26]
- the CSIRO's 2021 electric vehicle projections report produced for AEMO as part of the 2021 inputs assumptions and scenarios report.

Since the regulatory proposal was submitted on 31 January 2023, new information has become available that impacts on the demand forecast and will need to be taken into consideration. This includes the CSIRO's 2022 electric vehicle projections on the EV charging profile and the ACT Government's updated EV forecast. As the information continues to develop, we require Evoenergy to update its forecast to reflect the latest available data where appropriate and refine its model input and forecasting approach for the revised proposal.

A.1.3 Reasons for decision

We have undertaken a bottom-up assessment of Evoenergy's forecast demand, which focussed on the forecasting methodology and inputs for modelling the demand trend used as the foundation of Evoenergy's demand forecast for the 2024–29 regulatory control period, as well as the step changes or block loads for new demand not covered in the trend. We have examined block loads associated with EV and non-EV related demand, such as residential and commercial developments, separately when reviewing the demand forecasts. We also conducted workshops and requested further information regarding Evoenergy's forecasting methods and modelling input assumptions used to forecast trend and block loads for both EV and non-EV related demand.[27]

There are two key demand forecasts that are used to determine growth on the network – system wide peak demand and zone substation peak demand. System wide peak demand is the highest demand of the year for the system whereas zone substation peak demand is the highest demands of the year at individual zone substations. These forecasts include both EV and non-EV growth.

Our assessment focused on the reasonability and robustness of the modelling approach and input assumptions, taking into account the most recent data shared with us and the dynamic nature of this work. The demand forecasting approach using a projected trend and adding block loads that are likely to occur during the forecast period is not new. However, the forecasting of EV demand in the case of ACT where there is a strong driver for EV uptake, in part arising from ACT Government policy[28] does present Evoenergy with a number of

---

26 Evoenergy, *Marsden Jacobs-Appendix 1.4 Net Zero Modelling Journey-January2023_Public*, January 2023, p. 6.

27 We held a workshop on Evoenergy's Net Zero Model forecasting approach and input assumptions on 28 March 2023 and issued 4 information requests, IR#007 (20 March 2023), IR#014 (4 April 2023), IR#027 (12 May 2023) and IR#032 (13 June 2023).

28 ACT Government, *Zero Emission Vehicles Strategy 2022-30.*

evolving challenges. This is particularly the case when considering key input assumptions such as the sale of EVs and customers' expectations for EV charging services.

Whilst we are generally comfortable with the forecasting methodologies used to develop the trend and EV related block loads, the methodology for forecasting non-EV block loads and associated post-modelling adjustments required further explanation. We have tentatively accepted the post-modelling adjustment approach for block loads in relation to EVs, and only some of the non-EV loads relating to data centres and electrification of bus depots where the individual historical impact has been limited and unlikely to be captured in the historic trend. We consider post-modelling adjustments should not double count any load that is already part of the forecast trend. We are concerned there may be potential duplications for residential and commercial developments included in provisional block loads for future development.[29] We have not accepted in principle the post-modelling adjustment approach for block loads for new developments. We consider that there remains insufficient justification overall to support the input assumptions used in the modelling process.

We have arrived at a lower alternative forecast of demand than proposed by Evoenergy but this is not a conclusive estimate and we recognise that further work needs to be done to refine the forecasting methodology and update key inputs taking into account more recent data, such as EV sales, and research regarding EV uptake and customer charging profiles. For this reason, we consider that further assessment of the demand forecast will be necessary following Evoenergy's revised proposal, for our final decision in April 2024.

We have identified specific areas within the modelling process where Evoenergy can enhance its approach to forecasting demand that we expect Evoenergy to address in its revised proposal. We set out these improvements in more detail in the sections below on the forecast trend and, EV and non-EV block load forecasts.

Historical Trend

We are largely satisfied with Evoenergy's methodology for trending forward its historical growth. However, our assessment found that Evoenergy did not make any pre-data adjustments to the historic block loads. This means that the trend forecast has included historical block loads that should not have been included as part of the long-term trend for demand and results in an over or under estimation of the trend. For the purposes of the draft decision, we have not made adjustments to this trend because we do not have sufficient information. However, we require Evoenergy in its revised proposal to either make the appropriate historical block loads adjustments, or adequately explain why the adjustment is not necessary.

EV related demand forecast

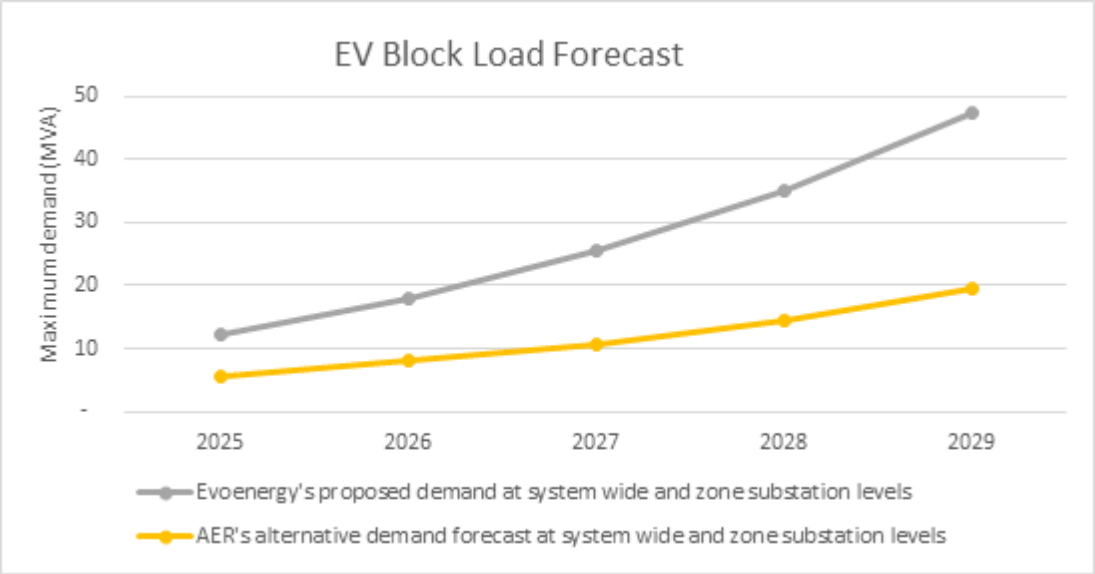
For the purposes of the draft decision, we have adopted a forecast of 20 MVA instead of the 48 MVA proposed by Evoenergy in its proposal for demand at both the system wide and zone substation levels. This represents a 59% reduction in demand compared to

[29] Evoenergy has proposed provisional block loads that are intended to cover private developments that are not included in the ACT Government's Indicative Land Release Program; *Response to IR#032_Full Response 20230627_Public*, 27 June 2023, p. 4.

Evoenergy's initial proposal and results from an updated lower demand provided by Evoenergy in April 2023.

Figure A.3 shows the comparison of Evoenergy's proposed EV forecast with our alternative forecast.

Figure A.3 Comparison of Evoenergy's proposed EV forecast with our alternative forecast (MVA)



Source: AER analysis

Evoenergy's EV forecasts are modelled separately and added as 'block loads' and are also incorporated into network studies to project feeder loads.[30] Evoenergy developed its EV forecasts by:[31]

- deriving the forecast annual electric vehicle energy consumption for passenger vehicles by zone substation using the Deloitte Access Economics report
- adjusting the energy usage to account for commercial vehicles and trucks, using data from its net zero model
- identifying the proportion of energy usage consumed during peak periods based on the CSIRO's 2021 EV charging profiles
- undertaking reasonableness checks.

We consider this approach to be reasonable and are comfortable with the EV forecasting method used by Evoenergy in the circumstances. However, we expect the EV block load forecasts would be updated based on more up to date EV charging profile assumptions.

Following our discussions with Evoenergy and subsequent information request regarding our concerns on the input assumptions around the demand impact of tariffs, we received

30 Evoenergy, *Response to information request #007: Appendix 2, 26 April 2023*, p. 1.

31 Evoenergy, *Response to information request #007: Appendix 2, 26 April 2023*, p. 4.

updated EV forecasts from Evoenergy on 26 April 2023. We applied this lower set of EV related demand forecasts in arriving at our alternative estimate for the purposes of this draft decision. The lower EV demand forecast reflects, in part, a more updated approach to the EV charging profile, which is a key input to the EV demand forecast. The update has used more recent advice on the convenience charging profile assumed by CSIRO in its EV modelling work for AEMO.[32] The assumed peak hour consumption for EV charging changes from 12% throughout the forecast period to a declining share of 5.47% by 2029.[33] This means the share of energy used for charging EVs is forecast to decline over time and that EV charging is to move away from the peak time (7pm – 8pm charging window).

In addition to the update from Evoenergy, we also made a further revision for the split of CBD load between East Lake and Civic zone substations. This is based on Evoenergy's response on 20 June 2023 which confirms 65% of feeders in Civic (the central business district) are connected to the City East zone substation and 35% connected to the Civic zone substation.[34]

Evoenergy is exploring the possibility of some zone substations experiencing daytime peaks and may consider further changes in its demand forecast modelling for the revised proposal.[35] If this is the case then we would require additional evidence such as trial data and data from public chargers to substantiate these impacts.

Although we have used the updated EV forecast and are comfortable with the overarching approach to forecasting, we consider there are still a number of improvements Evoenergy should address in its revised proposal:

- for the zone substation peak demand, Evoenergy should take a more sophisticated assumption than winter evening peak for EV block loads to properly account for the various hourly load profiles for EV charging across zone substations which may have different peak times
- Evoenergy should continue to update its forecasts to reflect the latest inputs from AEMO
- provide greater transparency around the underlying assumptions applied for EV demand forecasts to inform the demand forecasting and augmentation capital expenditure assessment
- further revise the assumption on EV uptake (based on the updated ACT Government forecast) and charging profile on an energy per vehicle basis and zone substation peaking time.

Non-EV demand forecast

For the purposes of the draft decision, we have adopted a forecast of 15 MVA for demand at the system wide level and 49 MVA at the zone substation level, instead of the 26 MVA and 149 MVA proposed by Evoenergy in its initial proposal, respectively. This represents a 27%

---

32 Evoenergy, *Response to information request #007; EV charging and behavioural response to cost reflective tariffs – 20230320*, *26 April 2023*, p. 9.

33 Evoenergy, *Response to IR#027-20230523-Public*, p. 8; *and Response to IR#032_Full Response 20230627_Public*, p. 21.

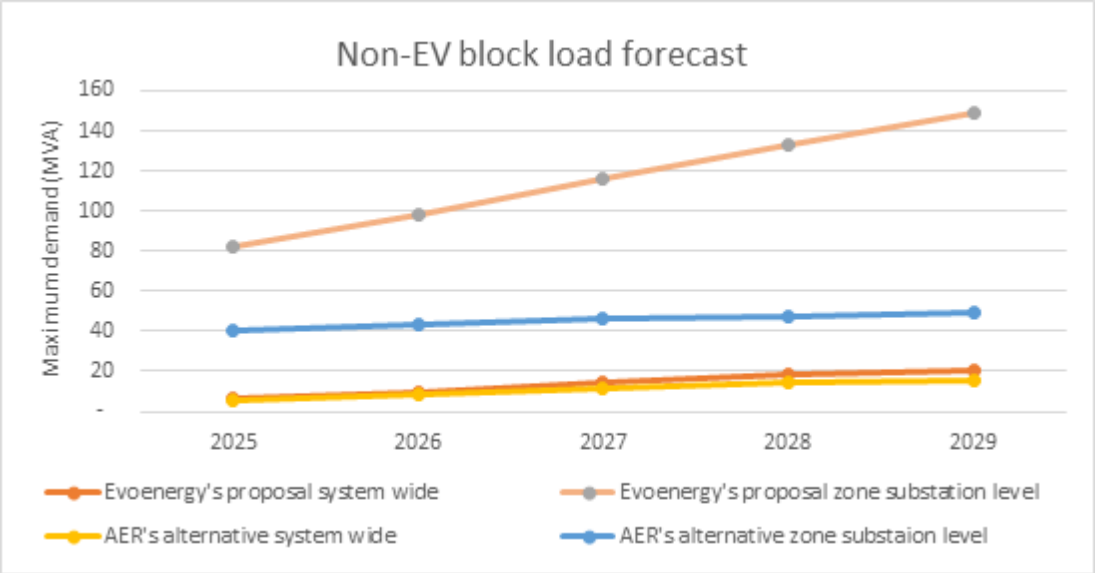
34 Evoenergy, *Response to IR#032_Full Response 20230627_Public,* 27 June 2023, pp. 19–20.

35 Evoenergy, *Response to IR #027,* 23 May 2023*,* p. 3.

reduction in demand at the system level and a 67% reduction at the zone substation level as a result of removing new development projects and provisional block loads.

Figure A.4 shows the comparison of Evoenergy's proposed non-EV forecast with our alternative forecast.

Figure A.4 Comparison of Evoenergy's proposed non-EV forecast with our alternative forecast (MVA)



Source: AER analysis

Non-EV demand forecast is broadly classified into four categories; new residential and commercial development projects, an additional block load which Evoenergy referred to as 'provisional block loads for future development', data centre projects and electrification of bus depot projects. Provisional block loads are intended to cover private developments that are not included in the ACT Government's Indicative Land Release Program.

Our alternative demand forecast for non-EVs has removed the block load forecasts for new development projects because we do not consider that there is sufficient information to support the post-modelling adjustment approach that Evoenergy has applied to block loads and how the forecast is derived.

We have also removed Evoenergy's proposed provisional block loads for future development on the basis that Evoenergy did not provide information or supporting evidence to justify the inclusion of an additional provisional block load from new developments. Further, we have in principle concerns regarding the need to include both types of block loads which may have been included as part of the trend forecast.

While we are not entirely comfortable with Evoenergy's approach to forecasting block loads and post-model adjustments, we have accepted the post-modelling adjustments where the individual historical impact has had little or limited consequence, and unlikely to be captured in the estimated historic trend. These include adjustments for data centres, off-peak load for bus depots, and the load transfer from Fyshwick Zone Substation (to be commissioned in 2024) to East Lake Zone Substation.

Our primary concern is the susceptibility of Evoenergy's overall modelling approach to duplication. There's a possibility that certain forecasted block loads for residential and commercial developments including provisional block loads for future development may have already been accounted for in the baseline trend forecasts. Evoenergy should refine its approach with the following considerations:

- block loads above the trend should be removed from the historical period and added to the forecast period to prevent duplications that have been captured within the trend component of the demand forecasts. This is to ensure only the demand impact driven by factors such as population, economic growth, energy prices, demand management, CER and energy efficiencies is carried to the forecast period as part of the trend projection
- adjustments for block loads above the long trend should be observed for any trend estimated, regardless of whether the trend is estimated to be positive or negative. This is because the trend can result from an offset between the increasing demand from population and economic growth and the decline in the historical period due to other long-term demand drivers (for example, rising electricity prices, demand management, photovoltaic systems, battery storage and greater energy efficiencies)
- fundamentally it is population and economic growth that drives up electricity consumption and demand in the longer term. Evoenergy should take into account its historic understanding of the drivers affecting electricity demand to ensure the residential and commercial block loads only reflect the forecast above the trend
- Evoenergy included a threshold of 0.5 MVA to identify large residential, commercial, or mixed development so that these large projects can be added to the block load forecast. However, this threshold is not consistently applied to prevent double counting in the baseline trend. Further, we require Evoenergy to provide its rationale for selecting 0.5 MVA as the threshold.

Conclusion

We are not satisfied with Evoenergy's proposed demand forecast and have substituted a lower demand forecast at both the system wide and zone substation levels, and in summary, consider that Evoenergy should address the following matters its revised proposal:

- further consideration of individual demand drivers such as population and economic growth, price changes, demand management including time-of-use tariffs, and technological changes like energy efficiency, consumer energy resources, and their demand impact.
- the methodology for forecasting non-EV peak load needs to be more comprehensive, with a clear and detailed outline of the method used. Deviations from this methodology should be thoroughly explained and justified. This extends not only to individual projects, but also for different load types, the project probability used, and the application of seasonal factors
- the consideration of a consistent time period for its historic data to model the demand at the system wide level and zone substations, and an explanation of the rationale for the chosen periods

- provide further explanations on assumptions applied to take account of the impact from gas to electricity conversions and time-of-use tariffs
- provide further clarification on how the method is applied using the sample data and supporting evidence along with summary information to estimating the maximum demand for projects as well as for different types of load
- provide a clearer rationale for the selection of specific input parameters, especially in cases where discrepancies or variations in inputs have been introduced.

A.2 Augmentation Capital 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 and security of supply requirements. Evoenergy's augmentation consists of expenditure on demand driven, secondary systems and reliability and quality improvement projects.

A.2.1 AER's draft decision

We are not satisfied that Evoenergy's proposed augmentation forecast of $181.6 million ($2023–24) reflects the capex criteria.[36] Our decision is to include $104.6 million for augmentation in our alternative capex estimate. This is a $77.7 million ($2023–24) or 42.8% reduction in augmentation capital expenditure. Most of this reduction, ($71.6 million or 96%) concerns EV demand related projects that are largely deferred because the network will be able to accommodate the current projected level of demand from EVs over the 2024–29 regulatory control period. There is also a $6.1 million reduction in augmentation as a result of the lower non-EV demand.

Our alternative forecast does not include all of Evoenergy's demand driven augmentation because we have not accepted Evoenergy's demand forecast (as discussed in section A.1 above), but includes secondary systems related capex and a majority of the reliability and quality improvements capex.

Table A.1 shows a comparison between our draft decision and Evoenergy's proposal.

Table A.1 AER's draft decision on augmentation by capex category ($ million, $2023–24)

Category	Evoenergy's proposal	AER's draft decision	Difference ($)	Difference (%)
Demand Driven	161.5	85.8	-75.7	-46.9%
Secondary systems	7.8	7.8	-	-
Reliability and Quality Improvements	12.3	10.3	1.9	-16.1%
Total augmentation capital expenditure	**181.6**	**104.6**	-77.7	**-42.8%**

Source: AER analysis. Numbers may not add up due to rounding.

A.2.2 Evoenergy's proposal

Evoenergy proposed $181.6 million in augmentation expenditure which is largely demand driven as shown in the Table A.1 above. The proposed demand driven expenditure is

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

primarily for zone substations and distribution feeder projects, together with some provisions for low voltage upgrades. This is due to a forecast uplift in demand for network services, particularly for EV charging, in response to the ACT Government's policy of net zero by 2045.

In addition to the demand driven augmentation, Evoenergy also proposed:

- $7.8 million in secondary systems expenditure for zone substation controls and supervisory control and data acquisition (SCADA) communications
- $12.3 million on reliability and quality expenditure for projects including distribution network monitoring, a grid-scale community battery, underground feeder reliability improvements and replacement of some uncovered high voltage conductors in bushfire prone areas.

A.2.3 Reasons for decision

Our draft decision on augmentation capital expenditure is mainly driven by the reduction in the demand forecast (set out in section A.1 above). A number of Evoenergy's proposed projects can be deferred and are no longer required in the 2024–29 regulatory period when applying our alternative demand forecast.

We have included the proposed secondary systems expenditure of $7.8 million in our alternative forecast but not all the proposed $12.3 million for reliability and quality improvements (we have excluded the proposed community battery).

We had regard to Evoenergy's proposal, further information provided by Evoenergy, submissions from stakeholders and engaged engineering consultants, Energy Market Consulting associates (EMCa) to undertake a detailed review of Evoenergy's augmentation expenditure based on our alternative demand forecast.

EMCa reviewed Evoenergy's augmentation proposal, which was based on its proposed demand forecast, and gathered additional information from Evoenergy through workshops[37] and information requests.[38] EMCa then considered and took into account our alternative demand forecast and the implications this has on Evoenergy's augmentation requirements. This formed the basis for EMCa's advice on Evoenergy's augmentation capital expenditure requirements for the 2024–29 regulatory control period.

EMCa considered that the lower demand forecast will allow Evoenergy to defer a significant amount of expenditure that it proposed in the final years of the regulatory period, some of which was to meet expected further demand growth in the years immediately following.[39]

We received 5 stakeholder submissions on Evoenergy's proposed augmentation expenditure:

---

37 EMCa and AER staff attended an on-site workshop with Evoenergy on augmentation capital expenditure in Canberra on 20 April 2023.

38 AER, *IR#015 – EMCa questions on augmentation capital expenditure,* 5 April 2023 *and IR#017- EMCa questions following the 20 April 2023 on-site workshop,* 26 April 2023*.*

39 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* p. 53.

- ACT Government is supportive of additional investment for network augmentation [40]
- ACTCOSS recognised the need to increase augmentation to accommodate the increasing electrification and EV uptake. However, ACTCOSS was concerned that this will result in inequity where low income users will still be paying for the network upgrades but are unlikely to be able to participate in or benefit from electrification[41]
- Conservation Council ACT Region considers that it is appropriate that the largest component of Evoenergy's proposed capex is augmentation capex guided by the forecast uptake of EVs and household electrification in response to the ACT Government's zero emissions vehicles and electrification strategies. However, it is concerned about low income earners being able to benefit from these services[42]
- Consumer Challenge Panel, sub-panel 26 (CCP26) considered that the customer support for the significant increase in augmentation expenditure was not strong and non-network solutions as a part alternative to increased capex expenditure were not adequately explored with customers [43]
- Suburb Zero supported Evoenergy's proposal and considered it pivotal to the electrification in the ACT.[44]

The reasons for our draft decision on augmentation are discussed further in the following sections.

Demand driven capex

Demand driven augmentation is driven by two factors, EV demand and non-EV demand. The EV driven augmentation refers to capex required in order to support the ACT Government's policy of net zero by 2045. The non-EV driven augmentation refers to capex required to meet the increase in demand from traditional load growth, such as residential and commercial developments, hospitals, data centres and embassies in Canberra.

The proposed demand driven expenditure is largely for zone substation and distribution feeder projects, and some provisions for low voltage upgrades. We consider that Evoenergy has provided adequate evidence to support its choice of augmentation options, based on its peak demand forecast. EMCa also considered the scope of Evoenergy's proposed augmentation solutions based on Evoenergy's proposed demand forecast were reasonable.[45] EMCa noted in its advice that:

> Evoenergy has provided adequate evidence to support its choice of augmentation options, for a given peak demand forecast, for regulatory allowance purposes. The processes demonstrated in Evoenergy's

---

40 ACT Government Shane Rattenbury MLA, *Submission – 2024-29 Electricity Determination – Evoenergy*, May 2024, p. 2.

41 ACTCOSS, *Submission – 2024-29 Electricity Determination – Evoenergy*, May 2024, pp. 10–11.

42 Conservation Council ACT Region, Submission – 2024-29 Electricity Determination – Evoenergy, May 2024, pp. 4–6.

43 CCP26, *Submission – 2024-29 Electricity Determination – Evoenergy*, May 2024, p. 12.

44 Suburb Zero, *Submission – 2024-29 Electricity Determination – Evoenergy*, May 2024, p. 3.

45 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* pp. 31, 34, 43, 49, and. 54.

> documentation give us reasonable confidence that Evoenergy will select appropriate options at the time when it makes investment decisions, and that this will take account of any improvement opportunities that may be available at that time.[46]

However, as outlined in section A.1 above, we are not satisfied with Evoenergy's proposed demand forecast and have substituted a lower demand forecast. The reduction in the demand forecast has meant changes in capacity constraints forecast at various locations on Evoenergy's network. This impacts on the need to undertake augmentation projects within the 2024–29 regulatory control period, or in future periods.

EMCa advises that the proposed augmentation capital expenditure considerably overstates Evoenergy's requirements based on the lower peak demand assumption. A significant amount of expenditure that it proposed in the final years of the regulatory period can be deferred, some of which was to meet expected further demand growth in the years immediately following, which is no longer evident with the alternative demand forecast. It is also not evident that Evoenergy has taken account of the opportunities that its proposed CER investment will provide and which, if properly harnessed, can allow it to accommodate the impact of the ACT net zero policy without undertaking unnecessary expansion of its distribution network.[47]

The lower demand forecast results in a $75.7 million ($2023–24) or 46.9% reduction in demand driven augmentation capital expenditure. As the information continues to develop, Evoenergy will update its demand forecast to reflect the latest available data and refine its model input and forecasting approach for the revised proposal. The augmentation expenditure forecast will be further reviewed based on the updated demand forecast that Evoenergy will provide in its revised proposal.

Set out below, we consider in more detail Evoenergy's EV and non-EV components of its demand driven augmentation.

EV demand driven augmentation

Evoenergy proposed $74.8 million in EV related augmentation projects which includes zone substations and low voltage supply upgrades. EMCa identified projects that were required or no longer required in the 2024–29 regulatory period. We have accepted EMCa's approach and advice regarding the EV driven augmentation capital expenditure deferrals. Table A.2 shows the list of projects that Evoenergy proposed as EV driven augmentation and our draft decision.

---

46 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* p. 54.

47 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* p. 54.

Table A.2 Evoenergy's proposed EV driven projects ($million 2023–24)

Description	Total cost	AER Draft decision
Supply to Braddon	3.9	Defer to future regulatory period
Supply to Watson	3.0	Defer to future regulatory period
Supply to Ainslie	4.8	Defer to future regulatory period
Supply to Campbell	5.0	Defer to future regulatory period
Supply to Franklin	5.0	Defer to future regulatory period
Supply to Garran and Red Hill	2.5	Defer to future regulatory period
Supply to Phillip	4.5	Defer to future regulatory period
Supply to Canberra CBD feeder 1	3.2	Required
Supply to Canberra CBD feeder 2	2.6	Defer to future regulatory period
Supply to Canberra CBD feeder 3	0.3	Defer to future regulatory period
Mitchell zone substation	2.2	Defer to future regulatory period
Curtin zone substation stage 1	19.3	Defer to future regulatory period
Zone substation QoS reactive plant	2.1	Defer to future regulatory period
EN24 Distribution substation upgrade	5.1	Defer to future regulatory period
EN24 low voltage circuit overhead program	2.9	Defer to future regulatory period
EN29-34 Woden to Curtin 132kV underground cable	8.5	Defer to future regulatory period
Total	**74.8**	**3.2**

Source: AER analysis.

With our alternative lower EV peak demand forecast, EMCa's view is that most if not nearly all of the proposed projects are not required within the next regulatory control period with the exception of Supply to Canberra CBD feeder 1. Our alternative forecast is $3.2 million ($2023–24) and a 96% reduction from Evoenergy's proposed EV related augmentation based on the lower forecast demand for EVs.

Non-EV related demand driven augmentation

Evoenergy proposed $86.7 million in non-EV related augmentation projects.

EMCa considers the capex at the feeder project level is largely reasonable based on our alternative demand forecast.[48] EMCa also considers the proposed Strathnairn Zone

[48] EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023, p. 47.

Substation project and the third transformer at Gold Creek Zone Substation are reasonable.[49] However, EMCa considered that the Molonglo zone substation stage 3 second transformer upgrade ($4.1 million) is no longer required in the 2024–29 regulatory control period.[50]

We agree with EMCa's view that the alternative demand forecast is likely to impact on the need for the proposed non-EV drive augmentation and to accept the majority of the proposed non-EV driven augmentation. Our substitute non-EV demand driven alternative estimate is $82.6 million.

Table A.3 shows the list of projects that Evoenergy proposed as non-EV driven augmentation and our draft decision.

Table A.3 Evoenergy's proposed non-EV driven projects ($million 2023–24)

Description	Total cost	AER Draft decision
Molonglo Zone Substation	11.2	Defer second transformer to future regulatory period
Strathnairn Zone Substation	19.0	Required
Gold Creek Zone Substation Third 132/11 kV 55 MVA transformer	7.9	Required
11 kV Feeder from Molonglo Zone - Supply to Molonglo Valley District	3.3	Required
11 kV Feeder from Latham - Supply to Strathnairn extend 11 kV OLoghlen cable feeder	2.1	Required
11 kV Feeder from Belconnen Zone - Supply to Belconnen Town Centre	0.4	Required
11 kV Feeder from City East to Braddon (Donaldson St)	3.4	Required
Nona, Anthony Rolfe and Hamer Feeder Ties	0.6	Required
11 kV Feeder from East Lake to Kingston	1.0	Required
11kV Feeder from Strathnairn ZS	1.7	Required
Civic B13 S63 Supply to CBD Section	3.7	Required
11kV Feeder from East Lake ZS to Fyshwick Sec 38	0.7	Required
11kV Feeder from Civic ZS to Lyneham- Canberra Racing Club	5.3	Required
11kV Feeder from Woden ZS to Diplomatic Development - Curtin	5.3	Required
11kV Feeder from Woden ZS to Woden Town Centre	4.1	Required
11kV Feeder from East Lake ZS to Fairbairn	1.6	Required

[49] EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023, p. 42.

[50] EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex*, September 2023, pp. 35 and 37.

Description	Total cost	AER Draft decision
11kV Feeder from Gilmore ZS to Hume West	2.3	Required
11kV Feeder from Wanniassa ZS to Tuggeranong Mixed Developments	2.8	Required
11kV Feeder from City East ZS to Canberra CBD S3 & S37	5.0	Required
11kV Feeder from Gold Creek ZS to Gungahlin Mixed Development	5.2	Required
Total	**86.7**	**82.6**

Source: AER analysis.

Reliability and quality improvements

The proposed expenditure on reliability and quality is for projects including distribution network monitoring, a grid-scale community battery, underground feeder reliability improvements and replacing some uncovered high voltage conductors in bushfire prone areas.

Evoenergy proposes $12.3 million in reliability and quality improvements augmentation, including $1.9 million for a community battery.

EMCa's advice is that other than the community battery, the expenditure that Evoenergy has proposed for reliability and quality improvements is reasonable.[51]

Evoenergy has provided insufficient evidence on how the community battery will benefit customers. This is reflected in our analysis of its model which showed a negative net benefit. The community battery is a component of Evoenergy's consumer energy resources proposal, a majority of which is operating expenditure and is considered in attachment 6 – opex.[52]

Our draft decision is to not accept the $1.9 million proposed for the community battery but accept the remaining $10.3 million in reliability and quality improvements augmentation capex including the HV conductor, voltage regulation upgrades, power quality monitors and distribution network monitoring.

Secondary Systems

Evoenergy proposed $7.8 million in secondary systems. EMCa's advice is that this expenditure reflects the continued investment need in zone substation control and the development of Evoenergy's SCADA and communication systems. The expenditure is also in

---

51 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* p. 52.

52 EMCa reviewed Evoenergy's total expenditure on CER. For capex this included the community battery and IT system integration components for its proposed approach to dynamic operating envelops. For opex this included a step change. Other than the community battery, EMCa considered that Evoenergy's proposed expenditure on CER is reasonable; EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal Review of proposed expenditure on DER and Augex*, September 2023, p. 23.

line with historical expenditure set out in the annual planning report and consistent with Evoenergy's established strategic approach.[53]

Our draft decision is to accept the proposed $7.8 million secondary systems capex.

A.3 Replacement Capital Expenditure

Replacement expenditure (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[54]
- 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.3.1 AER's draft decision

We are not satisfied that Evoenergy's proposed replacement expenditure forecast of $117.6 million ($2023–24) reflects the capex criteria.[55] We consider that there is insufficient evidence to support Evoenergy's replacement expenditure for the 2024–29 regulatory control period. Our decision is to include $94.4 million for replacement expenditure in our alternative capex estimate. This is $23.2 million or 20% less than what Evoenergy proposed. We consider Evoenergy has not sufficiently demonstrated the need for an uplift in replacement expenditure above the historical trend. This reduction brings Evoenergy's expenditure in line with its historic average levels.

A.3.2 Evoenergy's proposal

Evoenergy proposed $117.6 million in repex, an increase of 24% above the actual and estimated repex in the current regulatory control period. Repex represents 20% of Evoenergy's proposed total capex.

---

53 EMCa, *Evoenergy 2024 to 2029 Regulatory Proposal - Review of proposed expenditure on DER and Augex,* September 2023*,* pp. 50–51.

54 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.

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

Evoenergy states that the repex proposal is being driven by a deteriorating System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) performance trend and the aging of its network assets.[56]

Evoenergy's repex is primarily made up of pole replacement, protection and HV cables. The most significant repex category is pole replacements ($36 million) representing 31% of Evoenergy's repex. This program includes the replacement of 1,955 distribution timber poles ($31.3 million) and 40 transmission poles ($2.2 million).

A.3.3 Reasons for the decision

Our assessment approach for this category uses a combination of a top-down and bottom-up approach. We use the repex model[57] to guide us in pinpointing areas for a more comprehensive bottom-up evaluation. However, in the case of Evoenergy we encountered a challenge due to the absence of historical expenditure data required to calculate unit costs for some of the asset classes, which meant the repex model outputs delivered inconclusive results. Typically, when unit costs are unattainable during calibration, we would substitute values from similar assets. However, manual substitution carries inherent risks, including the potential for double counting and an inflated overall outcome. Given the relatively limited data available for Evoenergy, we considered utilising substitutions from this constrained dataset could potentially distort the true rates and disproportionately affect the modelled scenarios.

Evoenergy engaged Cutler-Merz to model the replacement expenditure using our repex model. Cutler-Merz's approach to resolve the data issue is to use forecast rates.[58] We recognise the effort that Evoenergy has undertaken in developing the repex model for its regulatory proposal, however we consider there is a potential for this approach to result in distorted outcomes when implemented across various businesses and is not an approach we would adopt.

Furthermore, an examination of Evoenergy's unit costs compared to the median reveals a prevailing tendency toward higher costs, a finding substantiated by Evoenergy's consultant, Cutler Merz.[59]

Consequently, we have undertaken a more targeted review based on the materiality of the projected capital expenditures.

We examined Evoenergy's asset management documents and obtained further information through information requests,[60] focussing on the poles replacement program as this was the largest sub-category of replacement expenditure. On the whole, the additional information has not provided substantive support for Evoenergy's proposed uplift in repex.

In terms of asset management and risk assessment, and in response to our information request, Evoenergy stated that it had not undertaken net present value (NPV) modelling or

---

56 Evoenergy, *Evoenergy-Attachment 1 Capital expenditure-January 2023_Public,* January 2023, p. 33.

57 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.

58 Cutler-Merz, *Appendix 1.9: Repex Model Results,* January 2023, p. 11.

59 Cutler-Merz, *Appendix 1.9: Repex Model Results*, January 2023.

60 AER, information requests *IR#013* (31 February 2023) and *IR#028* (15 May 2023).

risk based analysis on the five largest repex programs because the programs are based on historic asset performance and recent inspections. [61] This means that the historical asset replacement should provide a good indication on program volumes as the majority of these programs are based on reactive replacement strategies i.e. replacements made when inspection reveals defects. Therefore, we would expect the forecast for these programs should reflect the trends evident from historical replacement practices. However, it is difficult to see that the forecast does reflect historic asset performance and recent inspections given the 24% increase in repex, and no clear explanation for this increase over the historical trends.

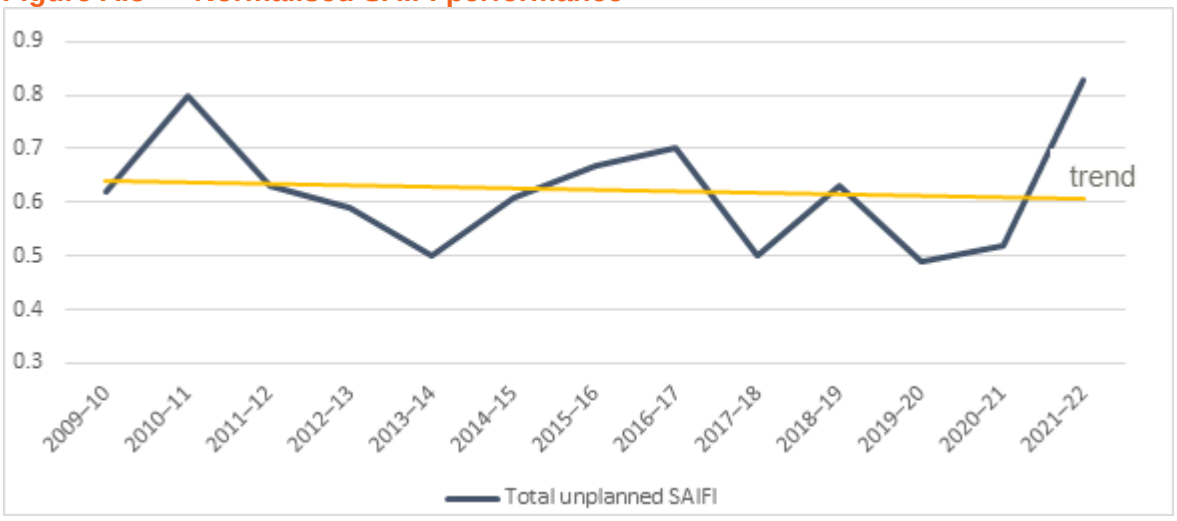
We do not agree with Evoenergy that any NPV modelling or risk based analysis to assess the economics of asset replacement would produce the same result as it proposed. This assumes that the current asset management practices are already economically optimised, which is not evident. In particular, Evoenergy appears to focus on asset age, and risk assessments do not appear to be well integrated into its investment decisions. As a result there is a gap in demonstrating the prudency and efficiency of the proposed repex in general. We expect Evoenergy to undertake a more comprehensive risk based assessment linked to economic justification for key aspects of its proposed repex such as poles, protections programs, overhead lines and high voltage cables.

In support of its proposed repex, Evoenergy raised concerns of SAIDI and SAIFI performance deterioration in 2021–22 and the general trend of these metrics. Whilst SAIDI, which measures the duration of an outage, is informative of reliability performance it largely goes to response and restoration times and does not directly relate to asset failures that are an underlining driver of the need for replacement. SAIFI, on the other hand measures the frequency or number of outages and is more directly related to the reasons for supply failure. We consider SAIFI is a more meaningful measure of asset performance.

Figure A.5 shows the historic SAIFI performance over the last 13 years. Although there is expected variation in performance between years, the trend indicates there is not a worsening of performance in the network.

[61] Evoenergy, *Response to IR#013 – Repex – 20230426-Public,* 26 April 2023*,* p. 3.

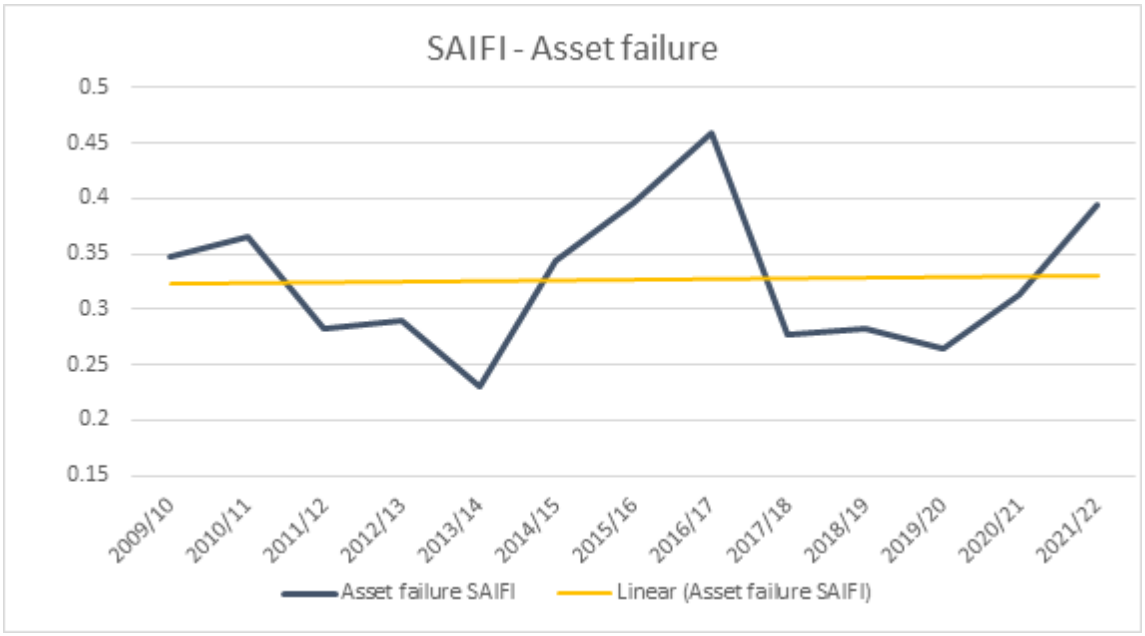
Figure A.5 Normalised SAIFI performance



Source: AER analysis

Asset failure accounts for the main reason for an outage and is a reasonable justification for asset replacement, however, analysis of Evoenergy's outage performance due to asset failure does not indicate that asset failure is becoming more common, rather, the trend indicates that the rate of asset failure has been maintained. This is shown in Figure 5.7 below.

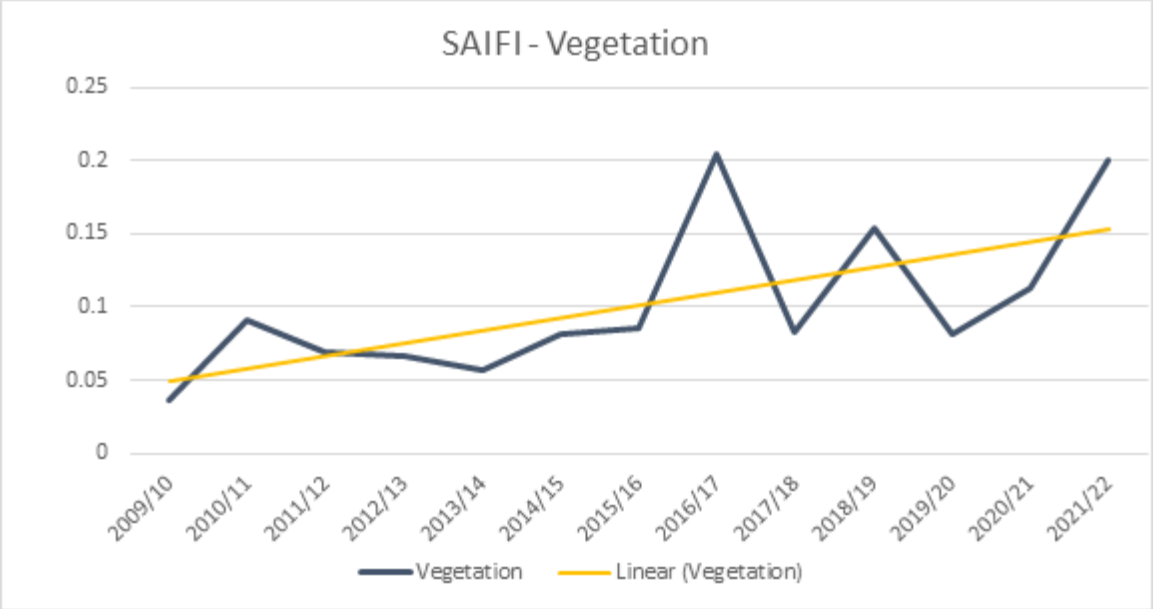
Figure A.6 10 year SAIFI normalised due to asset failure



Source: AER analysis.

Figure A.7 shows Evoenergy's SAIFI performance from vegetation – the frequency of interruptions caused by vegetation coming into contact with assets.

Figure A.7 10 year SAIFI normalised due to vegetation



Source: AER analysis.

Our analysis of Evoenergy's historic SAIFI data appears to show that the primary cause of changes in normalised SAIFI performance is from vegetation not asset failure. It appears that Evoenergy may have an emerging vegetation management issue rather than an asset deterioration issue and that asset failure is not driving a need to substantially uplift repex in the 2024–29 regulatory control period.

We have also assessed asset failure related repex from a bottom-up perspective, focussing primarily on poles as this is the largest proportion of the proposed repex. In the proposal we observed that the unit rate of the poles is higher than historic levels. This is being driven by Evoenergy's decision to replace wooden poles with concrete or composite poles that generally have a higher upfront cost.[62] However, we have not been provided with sufficient justification for the need to replace wooden poles with concrete or composite poles. We will require further evidence from Evoenergy such as business cases with NPV analysis to justify the uplift of the repex to address the specific issues with poles and the resulting volume of the replacement program. The cost benefit analysis should reflect the longer life of composite poles and these should be allocated to an asset class that reflects the longer expected useful life for depreciation purposes.

We also note that high voltage cables are one of the main sources of asset failure that contribute to reliability. Evoenergy noted that cable assets are particularly strong contributors, with high load criticality and long outage durations that have a large influence on reliability performance.[63] We acknowledge that high voltage cable failures are becoming more prevalent in recent years. However, we consider Evoenergy's additional repex does not appear to address the issue of the high voltage cable interruptions and further information

62 Evoenergy, *Evoenergy-Attachment 1 Capital expenditure-January 2023_Public*, January 2023, p. 35.

63 Evoenergy, *Appendix 1.14 Network Reliability Strategy-January 2023_Public*, January 2023, p. 27.

demonstrating the impact on reliability and the need to replace high voltage cables is required.

While Evoenergy points to natural timber poles and to high voltage cable failures as two assets of concern in regard to reliability performance, it has not provided sufficient information to demonstrate the need to increase repex above historic levels to address the expected performance of these asset types over the 2024–29 regulatory control period.

Conclusion

We have not included all of Evoenergy's proposed repex in our alternative forecast of total capex because further substantiating information is required to demonstrate the prudency and efficiency of the proposed repex. In its revised proposal, Evoenergy should provide information to show the need for the uplift in repex and demonstrate that the proposed increase is prudent and efficient. Such information should include analysis of asset performance to demonstrate expected degradation of reliability or safety outcomes, and NPV analysis that demonstrates the efficiency of any proposed increase in repex.

B Contingent Projects

Contingent projects are significant network augmentation or replacement projects that are reasonably required to be undertaken in order to achieve the capex objectives. However, unlike other proposed capex projects, the need for the project within the regulatory control period and the associated costs are not sufficiently certain. Consequently, expenditure for such projects does not form a part of the total forecast capex that we approve in this determination. Such projects are linked to unique investment drivers and are triggered by defined 'trigger events'. The occurrence of the trigger event must be probable during the relevant regulatory control period.[64] The cost of the projects may ultimately be recovered from customers in the future if the trigger events are met.

Evoenergy submitted that to address uncertainty around the speed of the energy transition and its impact on demand on its network during the 2024–29 regulatory period, our determination should facilitate the ability for Evoenergy to submit a further proposal to vary its capex during the regulatory period, where Evoenergy is able to provide compelling evidence that this is required.[65]

Evoenergy has proposed a contingent project that would be triggered where evidence emerges that the speed of the energy transition, in particular the uptake of EVs and electrification, is greater than assumed in the capex forecasts put forward in its regulatory proposal, where this requires Evoenergy to undertake a material program of works during the next regulatory period.[66]

Table B.1 summarises Evoenergy's proposed contingent project, proposed trigger events and estimated cost.

Table B.1 Evoenergy's proposed contingent project

Project	Proposed trigger event	Estimated cost ($2023–24)
Program of substation and feeder works	1. Observed EV take-up, independent projections of future sales and observed garaging locations differ substantially from those assumed in Evoenergy's demand forecasts; and/or 2. Recorded demand at one or more of Evoenergy's substations is within 90 per cent of the peak demand (N-1) capability of that/those substations for at least four consecutive half hour periods, or peak demand forecast to exceed the emergency rating within the next five years; and 3. Successful completion of a RIT-D that identifies network expenditure as the option or part of the option that maximises net market benefits to consumers.	$100–$150 million

64 NER, cl. 6.6A.1(c)(5).

65 Evoenergy, *Revenue Proposal 2023-24 to 2028-29, Appendix D: Addressing capital expenditure uncertainty*, January 2023, p. 11.

66 Evoenergy, *Revenue Proposal 2023-24 to 2028-29, Capital Expenditure Attachment (public),* 31 January 2023, p. 44.

Evoenergy considers that a material increase in EV take-up, or an increase in the speed of electrification by 2030, will require Evoenergy to upgrade additional substations and feeders and other work to maintain the reliability of its network during the 2024–29 period up to an estimated value of an additional $150 million.[67]

B.1.1 Assessment approach

We reviewed Evoenergy's proposed contingent project against the assessment criteria in the NER.[68] We considered whether:

- the proposed contingent project is reasonably required to be undertaken in order to achieve any of the capex objectives[69]
- the proposed contingent project capital expenditure is not otherwise provided for in the capex proposal[70]
- the proposed contingent project capital expenditure reasonably reflects the capex criteria, taking into account the capex factors[71]
- the proposed contingent project capex exceeds the defined threshold[72]
- the trigger events in relation to the proposed contingent project are appropriate.[73]

Evoenergy's revenue proposal included a description of the contingent project, proposed trigger events, project requirement, proposed capex and demonstration of rules compliance.[74]

We also considered whether the proposed trigger events for each project are appropriate. This includes having regard to the requirements in the NER for the trigger event:

- to be reasonably specific and capable of objective verification[75]
- to be a condition or event which, if it occurs, makes the project reasonably necessary in order to achieve any of the capex objectives[76]

---

67 Evoenergy, *Revenue Proposal 2023-24 to 2028-29, Appendix D: Addressing capital expenditure uncertainty*, January 2023, p. 11.

68 The requirements for acceptance of a contingent project are set out in cl. 6.6A.1 of the NER.

69 NER, cl. 6.6A.1(b)(1).

70 NER, cl. 6.6A.1(b)(2)(i).

71 NER, cl. 6.6A.1(b)(2)(ii).

72 NER, cl. 6.6A.1(b)(2)(iii).

73 NER, cl. 6.6A.1(b)(4).

74 Evoenergy, *Revenue Proposal 2023-24 to 2028-29, Attachment 1 Capital expenditure (public),* p. 44; and *Appendix D: Addressing capital expenditure uncertainty (public)*, 31 January 2023.

75 NER, cl. 6.6A.1(c)(1).

76 NER, cl. 6.6A.1(c)(2).

- to be a condition or event that generates increased costs or categories of costs that relate to a specific location rather than a condition or event that affects the distribution network as a whole[77]
- to be described in such terms that it is all that is required for the revenue determination to be amended[78]
- to be a condition or event, the occurrence of which is probable during the 2024–29 regulatory control period but the inclusion of capex in relation to it (in the total forecast capex) is not appropriate because either:
  - it is not sufficiently certain that the event or condition will occur during the regulatory control period or if it may occur after that period or not at all, or
  - assuming it meets the materiality threshold, the costs associated with the event or condition are not sufficiently certain.[79]

B.1.2 Draft Decision

We consider Evoenergy's proposed program of substation and feeder works contingent project should not be classified as a contingent project for the 2024–29 regulatory control period. We do not consider this project may be reasonably required to be undertaken to maintain the quality, reliability and security of supply, or to meet or manage the expected demand for distribution services over the 2024–29 period.

For the contingent project proposed by Evoenergy, we are concerned that the triggers are either too broad, not specifically clear and lack sufficient detail, including network specific locations, and required further justification. We sought additional information in regarding the proposed contingent project from Evoenergy.[80]

Evoenergy acknowledged that its proposed contingent project was not project specific and unlikely to meet the rule requirements.[81] Evoenergy informed us that it is proposing to resubmit a new contingent project in the revised proposal and is considering a specific load driven contingent project to upgrade the Mitchell zone substation with an estimated cost of at least $50 million, which includes the zone substation and associated feeder works.[82]

A number of submissions raised concerns with Evoenergy's proposed contingent triggers. The ACT Council of Social Service (ACTCOSS) submits that Evoenergy and the AER need to ensure the triggers are clear and quantified so that there is consistent understanding of what constitutes a trigger at the start of the regulatory period.[83]

---

77 NER, cl. 6.6A.1(c)(3).

78 NER, cl. 6.6A.1(c)(4).

79 NER, cl. 6.6A.1(c)(5).

80 AER and Evoenergy - *AER regular catch up 2024-29 reset- Contingent Project*, 5 July 2023.

81 Evoenergy, *email to the AER - Evoenergy - AER regular catch up 2024-29 reset- Contingent Project*, 12 July 2023.

82 Evoenergy, *email to the AER - Evoenergy - AER regular catch up 2024-29 reset- Contingent Project*, 12 July 2023.

83 ACTCOSS, *Submission - 2024-29 Electricity Determination – Evoenergy*, May 2023, p. 13.

Whilst the Conservation Council ACT Region supports the inclusion of a contingent project in response to the potential for faster than expected electrification and up take of EVs, it considers the triggers should be more specific and more transparent.[84]

Energy Networks Australia (ENA) supports the proposed use of the contingent project mechanism, which it considers balances regulatory flexibility with efficiency, ensuring that costs are minimised for consumers. The ENA submits that a clearly defined trigger event, and a comprehensive assessment and consultation process should that trigger event be successfully met, are important safeguard elements of the framework and will be applied under this approach.[85]

Origin Energy considers that Evoenergy's identification of contingent projects linked to event triggers (such as an unexpected increase in EVs) is appropriate given the uncertain policy environment and how customers will respond to policy initiatives.[86]

84 Conservation Council ACT Region, *Submission - 2024-29 Electricity Determination – Evoenergy*, May 2023, p. 6.

85 Energy Networks Australia, *Submission - 2024-29 Electricity Determination – Evoenergy*, May 2023, pp.1–2.

86 Origin Energy, *Submission - 2024-29 Electricity Determination - NSW and ACT,* May 2023, p. 3.

C 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.[87]

The NER require the review period to be:[88]

- the previous control period (excluding the last two regulatory years of that previous control period); and
- the last two regulatory years of the regulatory control period preceding the previous control period.

For the purposes of this decision, our ex-post assessment for this decision applies to the 2017–18 to 2021–22 regulatory years.

We may exclude capex from being rolled into the RAB in three circumstances: [89]

- when a NSP has overspent, the amount of capex above the allowance that does not reasonably reflect the capital expenditure criteria can be excluded from the RAB
- where there is an inflated related party margin, the inflated portion of the margin can be excluded from the RAB
- where a change to a NSP's capitalisation policy has led to opex being capitalised, the capitalised opex can be excluded from the RAB.

C.1 Position

Evoenergy incurred $4.3 million ($nominal) of capex above its forecast regulatory allowance for the ex-post review period. We are satisfied that Evoenergy's capex in the 2017–18 to 2021–22 regulatory years should be rolled into the RAB.

C.2 AER approach

We have conducted our assessment of past capex consistent with the approach set out in our Capital Expenditure Incentive Guideline (the Guideline). In our Guideline, we outlined a two-stage process for undertaking an ex-post assessment of capex:

- stage one — initial consideration of actual capex performance
- stage two — detailed assessment of drivers of capex and management and planning tools and practices.

---

87 NER, cl. 6.4A(a).

88 NER, cl. S6.2.2A(a1).

89 AER, *Capital Expenditure Incentive Guideline*, November 2013, p. 17.

The first stage considers whether the distribution business has overspent against its allowance and past capex performance. In accordance with our Guideline, we would only proceed to a more detailed assessment (stage two) if:

- a distribution business had overspent against its allowance
- the overspend was significant; and
- capex in the period of our ex-post assessment suggests that levels of capex may not be efficient or do not compare favourably to other distribution businesses.

C.3 AER assessment

We have reviewed Evoenergy's capex performance for the 2017–18 to 2021–22 regulatory years. This assessment has considered Evoenergy's actual capex relative to the regulatory allowance given the incentive properties of the regulatory regime for a distribution business to minimise costs.

Evoenergy incurred total capex above its forecast regulatory allowance for the ex-post review period. Therefore, the overspending requirement for an efficiency review of past capex is satisfied.[90]

Where we consider that the overspending requirement is satisfied, in accordance with our Guideline, we then consider a range of factors to determine whether to move to stage two of the ex post review. These factors are:[91]

- whether the overspend is significant
- what is the distribution business' history of capex
- how the distribution business has performed relative to other businesses.

We have identified that Evoenergy has overspent in years 2017–18 to 2019–20 and underspent in years 2020–21 to 2021–22. The accumulative over/underspend results in a net overspend for the review period.

We consider that an overspend of $4.3 million ($nominal), equivalent to 1.4% of Evoenergy's capex allowance over the period, is not material. Evoenergy did not report any capex deferrals over the period. Further, Evoenergy expects to underspend against its capex allowance by $7 million (2%) for the current regulatory period 2019–24.[92] We do not consider Evoenergy's capex expenditure during the ex post review period displays any consistent systemic overspending.

We are satisfied that including this actual capex in the RAB is likely to contribute towards achieving the capex incentive objective.

---

90 The overspending requirement is set out in NER, cl. S6.2.2A(c).

91 AER, *Capital Expenditure Incentive Guideline*, November 2013, p. 14; and AER, *Explanatory statement - Capital Expenditure Incentive Guideline*, November 2013, p. 47.

92 Evoenergy, *Revenue Proposal 2023-24 to 2028-29 - Appendix 1.1: 2019–24 period capital expenditure*, January 2023, p. 5.

Shortened forms

Term	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulatory
capex	capital expenditure
CCP26	Consumer Challenge Panel, sub-panel 26
CER	customer energy resources
DNSP or distributor	Distribution Network Service Provider
ENA	Energy Networks Australia
EV	electric vehicle
ICT	information and communication technologies
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
SCADA	supervisory control and data acquisition
SCS	standard control service