

# Draft Decision

Endeavour Energy

Electricity Distribution

Determination 2024 to 2029

(1 July 2024 to 30 June 2029)

Attachment 5

Capital Expenditure

September 2023

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#### **Amendment record**

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## 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).<sup>1</sup> 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).<sup>2</sup>

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).<sup>3</sup> 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)).<sup>4</sup>

The *AER capital expenditure assessment outline* explains our and distributors' obligations under the National Electricity Law and Rules (NEL and NER) in more detail.<sup>5</sup> 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.

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<sup>1</sup> These are services that form the basic charge for use of the distribution system.

<sup>2</sup> NER, cl. 6.5.7(a).

<sup>3</sup> NER, cl. 6.5.7(c).

<sup>4</sup> NEL, ss. 7, 16(1)(a).

<sup>5</sup> AER, [Capex assessment outline for electricity distribution determinations](#), February 2020.

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

Importantly, our decision on total capex does not limit a distributor's actual spending. We set the forecast at a level where the distributor has a reasonable opportunity to recover its efficient costs. Distributors may spend more or less than our forecast in response to unanticipated changes.

### 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*.<sup>6</sup>
- Regulatory Investment Test for Distribution and Transmission (RIT-D and RIT-T) Guidelines.<sup>7</sup>
- AER's *Asset Replacement Industry Note*.<sup>8</sup>
- AER's *Information and Communication Technologies (ICT) Guidance Note*.<sup>9</sup>
- AER's *Distributed Energy Resources Integration Expenditure Guidance Note*.<sup>10</sup>
- AER's *Guidance Note on Network Resilience*.<sup>11</sup>

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.<sup>12</sup>

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.

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<sup>6</sup> AER, [Expenditure Forecast Assessment Guideline 2013](#), August 2022.

<sup>7</sup> AER, [RIT-T and RIT-D application guidelines \(minor amendments\) 2017](#), September 2017.

<sup>8</sup> AER, [Industry practice application note for asset replacement planning](#), January 2019.

<sup>9</sup> AER, [AER publishes guidance on non-network ICT capital expenditure assessment approach](#), November 2019.

<sup>10</sup> AER, [Distributed energy resources integration expenditure guidance note](#), June 2022.

<sup>11</sup> AER, [AER publishes guidance note on network resilience](#), April 2022.

<sup>12</sup> AER, [Better Resets Handbook – Towards consumer-centric network proposals](#), December 2021.

## 5.1 Draft decision

Our draft decision is that we are satisfied that Endeavour Energy’s proposed total net forecast capex of \$1,850.9 million (\$2023–24) reasonably reflects prudent and efficient costs to maintain the safety, reliability and security of the network.

Table 5.1 outlines Endeavour Energy’s total capex forecast and our draft decision.

**Table 5.1 AER’s draft decision on Endeavour Energy’s total net capex forecast (\$ million, \$2023–24)**

	2024–25	2025–26	2026–27	2027–28	2028–29	Total
Endeavour Energy’s proposal and AER’s draft decision	430.6	400.5	359.6	347.9	312.2	1,850.9

Source: AER analysis and Endeavour Energy’s proposal.

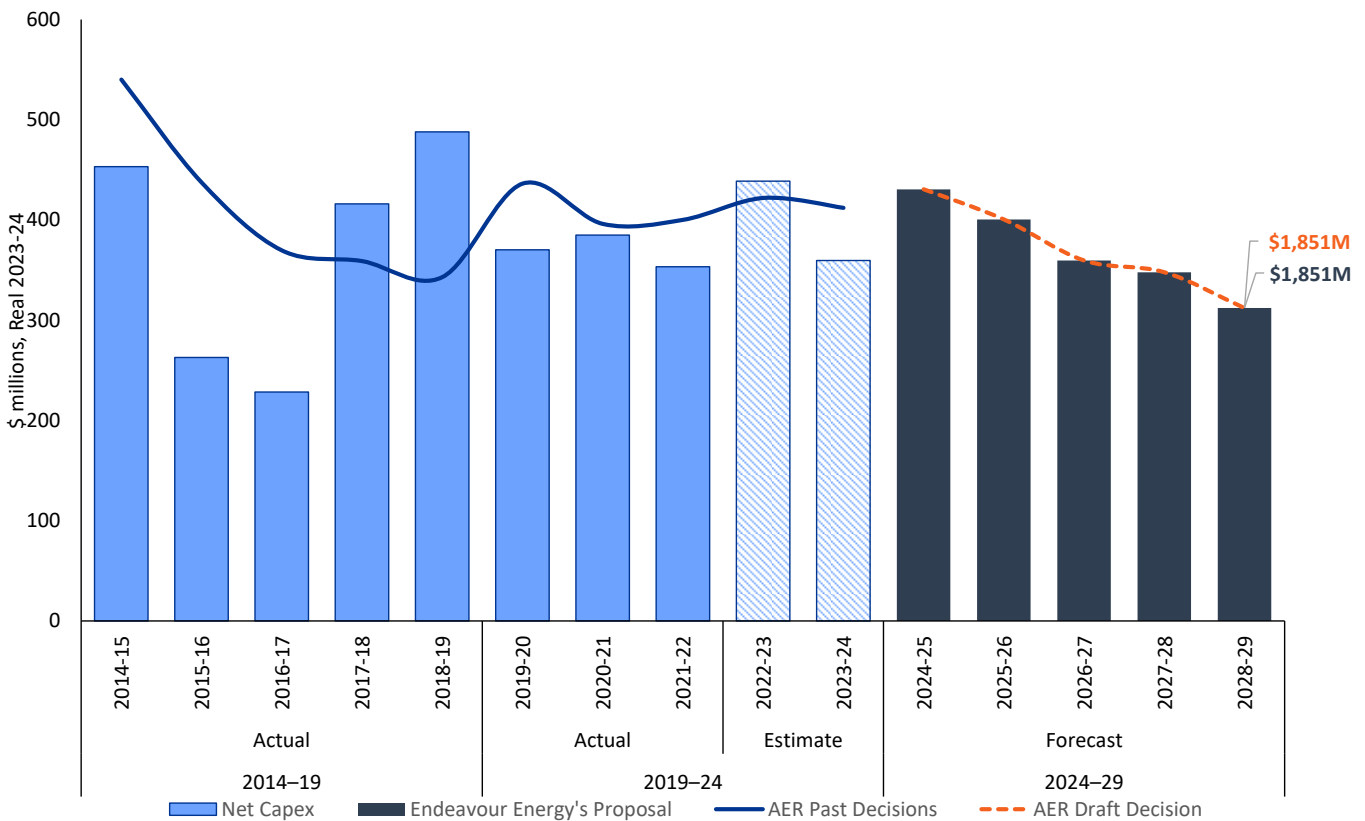
Note: Numbers may not sum due to rounding.

## 5.2 Endeavour Energy’s proposal

Endeavour Energy’s proposal forecasts \$1,850.9 million (\$2023–24) capex over the 2024–29 regulatory control period. Figure 5.1 depicts Endeavour Energy’s historical capex trend, its proposed forecast for the 2024–29 regulatory control period, and our draft decision.

Endeavour Energy’s forecast compares well against its current period spend, being 8% below current period actual and estimated spend excluding disposals. Its current period spend also tracks closely to the AER forecast in the current period. In the current period, Endeavour Energy has underspent in some categories, notably repex and augex, which has been offset by overspends in other categories; in particular, in Information Communication Technology (ICT) capex.

**Figure 5.1 Endeavour Energy’s historical and forecast capex (\$ million, \$2023–24)**



Source: AER analysis. Capex is net of asset disposals and capital contributions.

Table 5.2 provides a breakdown of Endeavour Energy’s capex proposal. In the forecast period, the main drivers of Endeavour Energy’s total capex forecast are repex and augex, making up 31% and 22% of the total forecast, respectively.

Major proposed repex investments include those in poles, high voltage distribution switchgears, oil cables, circuit breakers and switchboards. Its forecast repex is 4% above its current period spend. Similarly, for other recurrent expenditure like recurrent ICT, capitalised overheads, fleet, connections, and total non-system assets, we found Endeavour Energy’s forecast to be in line or lower than its current period spend.

Endeavour Energy’s forecast augex is in line with its current period spend. Its augex is driven by mostly expanding the network to new areas to cater for customer growth (greenfield investment) and also increasing the capacity of the existing network to cater for demand growth from existing customers (brownfield investment). Major investments include those for the Western Sydney Aerotropolis, an industrial/commercial hub around the Western Sydney Airport, and to support growth in North West Sydney and the South West and Greater Macarthur region.

Similar to other NSPs, Endeavour Energy has proposed investment in new and emerging areas of capex; notably, in consumer energy resources (CER), climate resilience and cybersecurity.

**Table 5.2 Endeavour Energy’s capex category forecast compared with actual/estimated capex in 2019–24 (\$ million, \$2023–24)**

Capex category	Endeavour Energy’s 2019–24 capex	Endeavour Energy’s 2024–29 capex	Change from 2019–24 (%)	Proportion of total capex (%)
Repex	551.7	574.5	4%	31%
Augex	412.9	412.6	0%	22%
Non-system assets <sup>(a)</sup>	472.9	225.7	-52%	12%
Connections	122	119	-2%	6%
Capitalised overheads	482.6	452.4	-6%	24%
CER integration <sup>(b)</sup>	2.6	50.0	n/a	3%
Resilience	n/a	28	n/a	1%
Innovation Fund	n/a	20	n/a	1%
<b>Total capex (excluding capcons)</b>	<b>2,044.6</b>	<b>1,882.2</b>	<b>-8%</b>	
Disposals	134.9	31.3		
<b>Net capex</b>	<b>1,909.7</b>	<b>1,850.9</b>		

Source: Endeavour Energy, attachment 10.11, January 2023 and AER analysis. Totals may not sum due to rounding.

Notes: (a) 2024–29 non-system assets include ICT (\$124m), Motor Vehicles (\$29.1m), Capitalised leases (\$18.1m), Building and Property (\$33.2m) and Other Non-system (\$21.3m)

(b) CER integration includes \$5.0 million for CER-related ICT. This amount has been subtracted from Non-system assets.

### 5.3 Reasons for draft decision

We reviewed Endeavour Energy’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 interrelationships between cost categories. To complement this, we conducted bottom-up analysis of Endeavour Energy’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 areas such as CER and resilience. 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 5.3 and Table 5.4 below.

Overall, we found that Endeavour Energy’s forecast of \$1,850.9 million (\$2023–24) would be required to maintain the safety, reliability and security of electricity supply of its network. We found some aspects of its forecast to not be consistent with prudent and efficient decision-making, especially in new and emerging areas of capex. But we also found that our alternative forecast at the total capex level to not be materially different from Endeavour



Energy's total forecast. We have set out areas of improvement in our draft decision for Endeavour Energy to consider in future processes.

### **Endeavour Energy's performance against the Better Resets Handbook expectations for capex**

In considering the scope of our review we had regard to how Endeavour Energy has performed against the *Better Resets Handbook* expectations for capex. Endeavour Energy is one of the businesses selected to be on the Early Signal Pathway. It, therefore, had the benefit of the AER indicating at the Issues paper stage the degree of the targeted review and where we would focus that review. At the Issues Paper stage, we found that Endeavour Energy performed very well against the capex expectations, satisfying almost all expectations. provides a summary of our assessment of Endeavour Energy's capex proposal against the Better Resets Handbook expectations for capex.

Our Issues Paper indicated our intention to undertake a targeted review on a small proportion of capex, approximately 15% of Endeavour Energy's total capex forecast and that it may be capable of acceptance at the draft decision stage. In coming to this position, we note that Endeavour Energy performed well against top-down testing of its total capex forecast with credible top-down constraints which we were able to verify. At the pre-lodgement phase, Endeavour Energy was very responsive to the AER's requests for information and data on a large sample of business cases we requested to assess for prudence and efficiency of decision-making. Further, at the two check-ins in July 2022 and September 2022, we found Endeavour Energy to be very open to our and stakeholder comments on early versions of its regulatory proposal. Most of the feedback we provided has been incorporated into Endeavour Energy's regulatory proposal.

In response to our Issues Paper, the AER's Consumer Challenge Panel (CCP26) observed that Endeavour Energy's capex proposal was surprisingly modest particularly given the scope of work required in Western Sydney. The CCP26 asked questions about this and stated that it is satisfied with Endeavour Energy's response that its capital contributions policy, a growing customer base and sound and responsible planning meant that there was no material additional cost burden for existing customers.<sup>13</sup> It also considered that distributed energy resources (DER), cyber and ICT costs have been the subject of detailed engagement and exploration of options. The CCP26 submitted that overall it is satisfied that the capex engagement outcomes and the modest size of the capex proposal validate the AER's targeted review of 15% of its total capex proposal.

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<sup>13</sup> CCP26, *Advice to the AER – 2024–29 Electricity Determination – Endeavour*, May 2023, p. 11.

**Table 5.3 Endeavour Energy’s performance against the capex expectations**

Capex expectations	Assessment	Position
1. Top-down testing of the total capex forecast and at the category level	<ul style="list-style-type: none"> <li>Total capex not materially different from current spend.</li> <li>Endeavour Energy’s repex modelled forecast is below the repex model threshold.</li> <li>Total repex and other recurrent expenditure is in line or lower than current period actuals.</li> <li>Several credible stakeholder-driven top-down constraints applied including: <ul style="list-style-type: none"> <li>- Reducing connections capex to \$119 million from \$133.8 million in response to stakeholder feedback.</li> <li>- Not claiming a CESS benefit from \$54 million of deferral in line with its Regulatory Reference Group (RRG) and broader stakeholder feedback.</li> </ul> </li> <li>While it has identified \$55.3 million of resilience projects, constraining its resilience proposal to \$28 million as part of its value for money proposal to its customers.</li> </ul>	Satisfied
2. Evidence of prudent and efficient decision-making on key projects and programs	<ul style="list-style-type: none"> <li>At the pre-lodgement phase, Endeavour Energy was very responsive to the AER’s requests for information and data on a large sample of business cases we requested to assess against this capex expectations.</li> <li>Our review of Endeavour Energy’s proposal indicates that it has incorporated this feedback.</li> <li>There is a significant improvement in Endeavour Energy’s material in support of its expenditure, compared to the previous review.</li> </ul>	Partly Satisfied. Not fully satisfied due to the need to review the new and emerging capex categories (CER, resilience, cybersecurity)
3. Evidence of alignment with asset and risk management standards	<ul style="list-style-type: none"> <li>Our review of Endeavour Energy’s asset management plan and associated documentation indicates that these are consistent with well-established relevant Australian industry standards.</li> </ul>	Satisfied
4. Genuine consumer engagement on capital expenditure proposals	<ul style="list-style-type: none"> <li>We observed Endeavour Energy’s efforts to engage with its consumer groups on key capex aspects of its proposal, informing but also genuinely seeking stakeholder feedback from its RRG, as well as circling back to respond to specific feedback raised at forums.</li> </ul>	Satisfied

### Our targeted review

Our targeted review involved:

- For some key augex projects, examining the investment timing and demand forecasts as these are major investments in the forecast period.
- CER integration, resilience-related capex and cybersecurity ICT, because these are new and emerging areas relevant to a number of current regulatory proposals.

For all other categories not subject to targeted review, we undertook a broad high-level review of the main business cases driving the forecast to determine whether there are any material or systematic issues that might lead to over-forecasting.

Having regard to all the information before us, we consider that Endeavour Energy’s total capex forecast reasonably reflects a prudent and efficient forecast. Therefore, our draft decision is to accept its total capex forecast for the 2024–29 period. Table 5.4 sets out our draft decision for Endeavour Energy by capex category.

**Table 5.4 AER’s draft decision by capex category (\$ million, \$2023–24)**

Category	Endeavour Energy’s proposal and AER’s draft decision
Repex	574.5
Augex	412.6
Non-system assets <sup>(a)</sup>	225.7
Connections	119
Capitalised overheads	452.4
CER integration <sup>(b)</sup>	50.0
Resilience	28
Innovation Fund	20
<b>Total capex (excluding capcons)</b>	<b>1,882.2</b>
Disposals	31.3
<b>Net capex</b>	<b>1,850.9</b>

Notes: (a) includes ICT, Motor Vehicles, Capitalised leases, Building and Property and Other Non-system  
(b) includes CER-related ICT. This amount has been subtracted from Non-system assets.

For some expenditure such as CER and the Innovation Fund, we assessed the forecasted investment to not be consistent with prudent and efficient decision-making. However, when we considered the total of these category level alternative estimates (in Table 5.5), we found that our alternative forecast at the total capex level was not materially different from Endeavour Energy’s total forecast. We also place weight on Endeavour Energy’s forecast being 8% lower than its expected gross capex in the 2019–24 period.

Table 5.5 summarises, and Appendix A provides further details on, the reasons for our draft decision, by capex driver. This reflects the way we have assessed Endeavour Energy’s total capex forecast. 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. We also note that our decision on total capex does not limit a regulated business’ actual spending.

**Table 5.5 Summary of our findings and reasons, by capex driver**

Driver	Findings and reasons
<b>Repex</b>	We have included Endeavour Energy’s repex forecast of \$574.5 million in the total capex forecast. Overall, we found that the information provided adequately supported the proposed expenditure and noted that the forecast is 4% above current period spending levels.  Endeavour Energy also performed well against the repex model, with its modelled forecast repex about 5% below the repex model threshold, which suggests that overall its forecast modelled repex performs comparatively well against other DNSPs.
<b>Augex</b>	We have included Endeavour Energy’s augex forecast of \$412.6 million in the total capex forecast.

Driver	Findings and reasons
	<p>We reviewed the investment timing and demand forecasts on a selected sample of large augmentation projects associated with the Western Sydney Aerotropolis as well as other major growth areas and found them to be reasonable. We focused on projects towards the end of the 2024–29 period that more likely to be sensitive to changes in forecast demand and economic conditions.</p> <p>Based on our review of North Kemp, Austral and West Dapto new substation projects (comparing the business case against its proposed capex), we observed instances where Endeavour Energy applied further constraints by pushing out projects where investment timing and costs are less certain at the end of the 2024–29 period and beyond.</p> <p>We also sought further information on other key projects and the augmentation portfolio in general and found Endeavour Energy’s response reasonable. Endeavour Energy noted in its response that its proposed \$413 million of augmentation is constrained from a bottom-up build of more than \$550 million.</p> <p>In addition, Endeavour Energy has identified \$54 million in augex deferrals in the current period which it is not claiming a CESS benefit for.</p>
<b>Connections</b>	<p>We have included Endeavour Energy’s connections forecast of \$119 million in the total capex forecast. Overall, we found that the information provided adequately supported the proposed expenditure and note that the forecast is 2% below current period spending levels.</p>
<b>Non-system assets</b>	<p>We have included Endeavour Energy’s non-system assets forecast of \$225.7 million in the total capex forecast. Endeavour Energy’s forecast for non-network ICT, fleet and property is 52% lower than the expected spend in the 2019–24 period. This includes increasing capex for capitalised leases, due to a change in accounting treatment which previously considered these as opex. Endeavour Energy’s proposed approach to forecasting non-recurrent ICT and ICT cybersecurity raised some minor concerns. In future regulatory proposals, we consider there are areas for improvement in Endeavour Energy’s approach to non-recurrent ICT and ICT cybersecurity, which we discuss further in Appendix A.1 and A.2. Overall, we found that Endeavour Energy provided sufficient information and our substitute estimate for non-system assets does not result in an alternative total capex forecast that is materially different from that proposed by Endeavour Energy.</p>
<b>Resilience</b>	<p>We have included Endeavour Energy’s resilience forecast of \$28 million in the total capex forecast. Endeavour Energy’s proposed approach to resilience raised some minor concerns. In future regulatory proposals, we consider there are areas for improvement in Endeavour Energy’s approach to resilience, which we discuss further in Appendix A.3. Overall, we found that Endeavour Energy provided sufficient information such that our substitute estimate would not be materially different from that proposed.</p>
<b>Innovation Fund</b>	<p>We do not consider Endeavour Energy has demonstrated its Innovation Fund capex of \$20 million (and its \$5 million ‘use it or lose it’ true-up mechanism) is prudent and efficient. Our alternative estimate does not include the capex for the innovation fund, which contributes a 1% reduction in our alternative estimate of total capex.</p> <p>In coming to our position, we found a lack of information to support the prudence and efficiency of the capex associated with its Innovation Fund including what projects would be included in that fund. There were differing stakeholder views on the proposed Innovation Fund capex. While there was support for the Innovation Fund from Endeavour Energy’s RRG, the Public Interest Advocacy Centre (PIAC) submitted that innovation should be seen as a response or tool rather than an output, and that transparency in innovation funding is important.<sup>14</sup></p> <p>Our decision does not limit Endeavour Energy from investing in the Innovation Fund in the 2024–29 period, as we do not approve individual projects or programs. We discuss our assessment and further guidance in Appendix A.5.</p>
<b>CER integration</b>	<p>We have included Endeavour Energy’s CER integration forecast of \$50 million in the total capex forecast. Our alternative estimate for CER integration is \$37.5 million, which contributes a 1% reduction in our alternative estimate of total capex. Endeavour Energy’s proposed approach to CER integration raised some concerns. In future regulatory</p>

<sup>14</sup> Public Interest Advocacy Centre, *Issues Paper 2024–29 Revenue Determinations: Ausgrid, Endeavour and Essential Energy*, June 2023, p. 11.

Driver	Findings and reasons
	proposals, we consider there are areas for improvement in Endeavour Energy's approach to CER integration, which we discuss further in Appendix A.4.
<b>Capitalised overheads</b>	We have included Endeavour Energy's forecast of \$452.4 million for capitalised overheads. Overall, we found that the information provided adequately supported the proposed expenditure and note that the forecast is 6% below current period spending levels.
<b>Asset disposals</b>	We have included Endeavour Energy's forecast of \$31.3 million for asset disposals.
<b>Ex-post review</b>	Our ex-post review of Endeavour Energy's capital expenditure is set out in Appendix B.

# A Reasons for decision on key capex categories

This appendix sets out our assessment of key capex categories and programs/projects within Endeavour Energy's total capex forecast and the reasons for our decision. This appendix includes:

- Non-recurrent ICT (A.1)
- ICT cybersecurity capex (A.2)
- Resilience capex (A.3)
- CER integration (A.4)
- Innovation Fund (A.5).

## A.1 Non-recurrent ICT

### A.1.1 AER's draft decision

We have included Endeavour Energy's forecast of \$54 million for non-recurrent ICT capex in the total capex forecast. We discuss Endeavour Energy's forecast capex for non-recurrent ICT cyber security in section A.2.

### A.1.2 Endeavour Energy's proposal

Endeavour Energy's proposal includes \$54 million in non-recurrent ICT capex, excluding the \$16.3 million for non-recurrent ICT cyber security capex discussed in section A.2. Endeavour Energy's forecast 2024–29 non-recurrent ICT capex is 76% lower than its expected 2019–24 period spend.

Endeavour Energy has classified four 'priority themes' for its 89 proposed non-recurrent ICT projects:

- Meeting core customer expectation for a safe, affordable and reliable electricity supply.
- Enabling customers' future energy choices for a sustainable future, moving us towards the future integrated and low carbon energy system.
- Providing a resilient network for the community adapting to changing climate and external hazards.
- Supporting the sustainable growth of communities.

Endeavour Energy provided an ICT asset management strategy, investment briefs with business cases and cost benefit models, and post-implementation reviews from projects undertaken in the 2019–24 period.

In developing its regulatory proposal, Endeavour Energy engaged with its RRG on ICT regarding:

- the post implementation reviews and the associated benefits realisation from the capability uplift and transformation in the 2019–24 period.
- alignment with the guidance, expectations and good practices in our ICT guidance note.<sup>15</sup>
- the benefits of the proposed ICT investment briefs in terms of benefit quantification, traceability, and realisation.
- commitments to undertaking post implementation reviews of major ICT projects in the 2024–29 period.

### **A.1.3 Reasons for decision**

We have reviewed the information Endeavour Energy provided in support of its non-recurrent ICT capex forecast, including the business cases and cost-benefit models. We engaged EMCa to review Endeavour Energy’s proposed capex for its non-recurrent ICT program.<sup>16</sup> Where required, we have sought further information from Endeavour Energy through information requests.

From our review and EMCa’s observations, we have identified some areas of improvement for Endeavour Energy’s ICT programs in future proposals to improve the cost-benefit analysis and cost estimation for the purposes of regulatory proposals. Overall, we found that Endeavour Energy provided sufficient information and our substitute estimate for this category of capex does not result in an alternative total capex forecast that is materially different from that proposed by Endeavour Energy. We had regard to the significant reduction in forecast ICT capex compared to the current period.

Our ICT Guidance Note sets out the expectations and good practices for ICT investment. An example of one of these expectations is that non-recurrent ICT projects that provide capability growth are expected to be supported by analysis that demonstrates a net economic benefit. We encourage Endeavour Energy to consider the following areas of improvement for its cost-benefit modelling and cost estimation for ICT:

- Using standard methodology for calculating net present value and benefit cost ratio, including using discounted cash flows and appropriately applying the weighted average cost of capital.
- Clearer explanation and justification of project benefits and the allocation of benefits to specific projects. Our guidance for ‘new or expanded ICT capability, functions and services’ expects that each non-recurrent, new-capability project should be proposed on the basis that it generates quantified benefits that exceed the costs.
- Using a counterfactual base case to compare the options against what would likely have occurred in the absence of the proposed investment options. Depending on the situation, the counterfactual may be the ‘business as usual’ approach (undertaking minimal incremental expenditure) or ‘do nothing’. The base case for comparison should be explicitly stated rather than implied.

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<sup>15</sup> AER, *Guidance Note for non-network ICT capex assessment approach*, November 2019.

<sup>16</sup> EMCa, *Report to AER on Endeavour Energy’s DER and ICT 2024–29*, August 2023.

- Removal of portfolio contingency allowance for non-recurrent ICT expenditure. Endeavour Energy's cost components are calculated in a manner largely consistent with industry norms, however we consider that the inclusion of a contingency in the proposed forecast would lead to an overestimate of the aggregate capex requirement. The use of contingency allowances at project level are standard practice, so the inclusion of an additional allowance at a portfolio level should not be necessary.

## A.2 ICT cybersecurity capex

### A.2.1 AER's draft decision

We have included Endeavour Energy's forecast of \$16.3 million for ICT cybersecurity in the total capex forecast.

### A.2.2 Endeavour Energy's proposal

Endeavour Energy has proposed \$16.3 million capex (and \$4.4 million opex) for its cybersecurity program. Endeavour Energy references recent legislative reforms that require it to assess and potentially strengthen its information and operational technology assets and cyber-security policies, frameworks, architectures and technologies. It refers to four primary legislative and contractual obligations in relation to cybersecurity:

- The *Security of Critical Infrastructure Act 2018* (including other related cybersecurity legislative requirements) which places obligations on specific entities in electricity and other industries
- The Australian Energy Sector Cyber Security Framework (AESCSF) published by the Australian Energy Market Operator (AEMO), which is referred to in the Security of Critical Infrastructure (Critical infrastructure risk management program (CIRMP)) Rule 2023
- The NSW electricity distributor license conditions, where there have been changes to the Critical Infrastructure Licence Conditions
- *Privacy Legislation Amendment (Enforcement and Other Measures) Act 2022*, which expands the Australian Information Commissioner's enforcement and information sharing powers and increases penalties for serious or repeated interferences with privacy.

Its cybersecurity investment strategy is predicated on maintaining its risk level in the 2024–29 period. Its proposal is aimed to achieve AESCSF Security Profile 2 (SP-2) for the 2024–29 period.

It engaged a consultant, Secolve, to undertake a gap analysis and audit in March 2022 to assess its current cybersecurity status, and to assist it in developing a cybersecurity strategy. The review resulted in three strategic goals being identified initiatives across Operational Technology and Information Technology to be delivered in the 2024–29 period to achieve AESCSF SP-2 maturity level. It also engaged Deloitte to validate its cybersecurity strategy including the high-level cost estimates for the proposed initiatives.



### A.2.3 Reasons for decision

We recognise the importance of cyber security investment in supporting a reliable and secure electricity network.

We engaged EMCa to review Endeavour Energy’s proposed capex for its cybersecurity program.<sup>17</sup> In coming to our position to accept Endeavour Energy’s capex forecast for this program, we had regard to EMCa’s advice that Endeavour Energy’s forecast capex is reasonable for a DNSP of its level of ‘medium’ criticality. Based on EMCa’s advice, our alternative estimate is \$13.1 million for cyber security capex. This alternative estimate is based on removing the proposed contingency costs, as this is not consistent with our expenditure forecast assessment guideline. The remainder of the cost estimate was otherwise reasonable. EMCa observed that Endeavour Energy commissioned a number of external reviews of its cyber security cost estimate. In addition to the Deloitte validation of the high-level cost estimates, Endeavour Energy commissioned a market comparison of its cyber security projects, with benchmarking observations of cost estimations and sizing of projects undertaken based on a target of SP-2.

We received one submission in response to our Issues paper about all of the NSW DNSP’s ICT cybersecurity proposal. PIAC submitted that given cybersecurity requirements are likely to be mandated, it considered the level of influence consumers can exert on this issue to be relatively low. However, it noted that the growing importance of cybersecurity does warrant discussion on how increased risk should be best shared between networks and its customers.<sup>18</sup>

In its report, EMCa also made a number of observations about the material Endeavour Energy provided to support its forecast. We encourage Endeavour Energy to consider these areas of improvement in future processes.

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<sup>17</sup> EMCa, *Report to AER on Endeavour Energy’s ICT cyber security 2024–29*, August 2023.

<sup>18</sup> Public Interest Advocacy Centre, *Issues Paper 2024–29 Revenue Determinations: Ausgrid, Endeavour and Essential Energy*, June 2023, pp. 16-17.

## A.3 Resilience capex

### A.3.1 AER’s draft decision

We have included Endeavour Energy’s forecast of \$28 million for its climate resilience program in the total capex forecast.

While we have assessed that Endeavour Energy’s total capex forecast reasonably reflects prudent and efficient costs, we found aspects of its climate resilience proposal to be inconsistent with prudent and efficient decision-making.

### A.3.2 Endeavour Energy’s proposal

Endeavour Energy proposed \$28 million capex for its climate resilience program.

Endeavour Energy submits that it has proposed climate resilience investment because the projected change in climate reflects an increasing level of risk of supply interruptions to customers.

It has not included expenditure for community resilience, submitting that it will investigate initiatives to improve community resilience as part of its proposed Innovation Fund.

#### Network impact modelling

Endeavour Energy commissioned the development of climate impact modelling and economic modelling from Deloitte. This work resulted in an estimate that Endeavour Energy faced a risk in excess of \$6 billion, which Endeavour Energy considered was overstated. Endeavour Energy have decided not to rely on this modelling in its proposal.<sup>19</sup>

In place of the more detailed climate impact modelling, Endeavour Energy has applied escalation factors (based on the Deloitte climate impact modelling) accounting for change in future climate related risk. Endeavour Energy claims that this results in a slowly escalating level of risk. Of the climate change perils considered, it has focused on the impacts of bushfire and flood to its network area.

Modelling has been based on RCP4.5 and Endeavour Energy adopts escalation factors based on its assumed increase in risk to the year 2090. It submits that its modelling resulted in \$55 million of climate resilience related investment but several top-down constraints were applied to bring its forecast to \$28 million. These top-down constraints include:<sup>20</sup>

- customer and stakeholder engagement;
- internal and external benchmarking;
- composition of other investment categories and outcomes, internal workshops and outcome priorities, including working within the constraints provided under the Better Resets Handbook approach;

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<sup>19</sup> EMCa, *Report to AER on Endeavour Energy’s Climate-Driven Network Resilience 2024–29*, August 2023, p. 14.

<sup>20</sup> Endeavour Energy, *Response to information request 021*, May 2023, p. 2.

- risk appetite and trade-off.

### **Proposed programs to mitigate increased risk from climate events**

The solutions proposed by Endeavour Energy focus on two programs:

- covered conductor replacement program targeting high bushfire risk areas (\$22 million); and
- the raising of select feeders in flood-prone areas of its network (\$6 million).

Endeavour Energy submitted a bushfire Case For Investment (CFI) to support replacement of high voltage overhead conductor linear assets with covered conductor thick (CCT) across its HV distribution network to address safety, reliability and bushfire risk. The scope of the bushfire CFI is to augment 855 overhead conductor linear assets totalling 211km in route length and replace with CCT.

Endeavour Energy submitted a flood CFI to support reconstruction of 26 HV distribution and 7 transmission overhead conductor spans identified as being at risk of flood impact. This would involve increasing the height of HV overhead conductors above the 1-in-50 year flood level (distribution) and the 1-in-100 year flood level (transmission). The flood CFI also includes the installation of 32 automated switches across the network to enable isolation to be delayed until flood waters reach critical levels.

### **A.3.3 Reasons for decision**

We acknowledge Endeavour Energy efforts to engage with its stakeholders on the future network and local effects of climate change. We also appreciate that there is much uncertainty around the impact of climate change on electricity networks, and its localised impact on communities. In this regard, we are aware that the electricity industry is still at the early stages of understanding the impact of climate change on networks and local communities, including how to best allocate risks from extreme weather events so that it is in long term interests of consumers.

To support broader discussions around network resilience, we developed a guidance note to assist stakeholders understand how resilience-related expenditure would be treated under the NER.<sup>21</sup>

In coming to our position on the prudence and efficiency of Endeavour Energy's climate resilience program, we have had regard to the extent that its proposal satisfies relevant criteria in our guidance note on network resilience. In that note, we set out our expectations of the type of evidence businesses should provide to demonstrate that its resilience-related proposal is prudent and efficient; these being:

- *Identified need*; that there is a causal relationship between the proposed resilience expenditure and the expected increase in the extreme weather event;
- *Testing of the preferred option*; that the proposed expenditure is required to maintain service levels and is based on the option that likely achieves the greatest net benefit of the feasible options considered; and

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<sup>21</sup> AER, *Network Resilience – a note on key issues*, April 2022.

- *Genuine consumer engagement*; that consumers have been fully informed of different resilience expenditure options, including the implications stemming from these options, and that they are supportive of the proposed expenditure.

We also had regard to EMCa’s advice in its technical review of Endeavour Energy’s proposed capex for its climate resilience program.<sup>22</sup>

Overall, we acknowledge Endeavour Energy’s efforts to provide the evidence set out in our guidance note to support the prudence and efficiency of its climate resilience investment, especially in light of much uncertainty around modelling of network impacts from the effects of climate change.

We discuss our assessment below, including the identification of areas of improvement in Endeavour Energy’s analysis that we encourage it to consider in future processes.

### **Identified need**

We consider that Endeavour Energy has not addressed this criteria.

For its investment to address bushfire risk, we consider that Endeavour Energy has identified a need for the investment but that this need does not relate to addressing the network impact from an expected increase in extreme weather events.

Endeavour Energy submits that the primary assumed benefit from its CCT investment is from escalating risk of bushfire incidents arising from conductor failure. EMCa observes that while such investment is reasonable, no causal relationship has been demonstrated of the network impact from increased extreme weather events. In particular, EMCa advises that its CCT investment for resilience appears to be a continuation of Endeavour Energy’s BAU covered conductor replacement program to address safety and reliability.<sup>23</sup>

Similarly, for Endeavour Energy’s investment to address flood risk, EMCa observes that its flood CFI is more indicative of a response to recent events, rather than a result of assessment of increasing risk of extreme weather. Nonetheless, EMCa advises that these investments will improve network resilience by addressing the reliability risks associated with these assets being affected by flood events.<sup>24</sup>

As noted in our guidance note, there is a close relationship between resilience and reliability because resilience is an input that contributes to the achievement of total reliability – the service level outcome. While improved reliability is generally referred to as the service level outcomes from a more resilient network, other service-level outcomes like maintenance of safety and network security of the network can also be affected.

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<sup>22</sup> EMCa, *Report to AER on Endeavour Energy’s Climate-Driven Network Resilience 2024–29*, August 2023.

<sup>23</sup> EMCa, *Report to AER on Endeavour Energy’s Climate-Driven Network Resilience 2024–29*, August 2023, p. 21.

<sup>24</sup> EMCa, *Report to AER on Endeavour Energy’s Climate-Driven Network Resilience 2024–29*, August 2023, p. 23.

## Testing of the preferred option

We consider that Endeavour Energy has addressed this criteria.

EMCa observes that option analysis was undertaken for Endeavour Energy’s proposed investments. Endeavour Energy also provides a list of its cost assumptions in its CFIs, with the assumptions derived from past programs and on-going experience of replacing similar type conductors within Endeavour Energy’s network over the past three years. EMCa advises that Endeavour Energy’s estimated costs are within reasonable limits.<sup>25</sup>

For future processes, we would encourage Endeavour Energy to consider including other alternative options of mitigating risks. EMCa observed that it would be appropriate to consider option value especially when modelling to the 2090 data point given that there are considerable opportunities available to mitigate risks as their impact becomes clearer.

## Genuine consumer engagement

We consider that Endeavour Energy has satisfied this criteria. We appreciate the challenges to engage with consumers on the network impacts from climate change and acknowledge Endeavour Energy’s efforts to better understand its customer’s preferences for resilience-related expenditure.

In response to the Issues Paper, the Western Sydney Regional Organisation of Councils (WSROC) submits that it welcomes the consideration of climate change and resilience in Endeavour Energy’s proposal, especially as the communities represented by the WSROC Councils are particularly vulnerable to the risks of bushfires, floods and extreme heat.<sup>26</sup>

PIAC submits that Endeavour Energy took a highly targeted and relatively restrained approach to resilience, which was based largely on the recent experiences of the Blue Mountains and South Coast bushfires, the repeated flooding of the Nepean and Hawkesbury Rivers and the Major Event Days which are excluded from reliability reporting. PIAC also acknowledged the Endeavour Energy Resilience Strategy as a useful framework to guide future engagement efforts and embed consumer voices. It also encouraged Endeavour Energy to undertake further work to understand community preferences about the management of climate risks and the trade-off between increased costs to reduce risk versus lower costs and/or increased capacity to respond to risks when they occur.<sup>27</sup>

## A.4 CER integration

### A.4.1 AER’s draft decision

We have included Endeavour Energy’s forecast of \$50.1 million for CER integration in the total capex forecast.

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<sup>25</sup> EMCa, *Report to AER on Endeavour Energy’s Climate-Driven Network Resilience 2024–29*, August 2023, p. 24.

<sup>26</sup> Western Sydney Regional Organisation of Councils (WSROC), *Submission – 2023 Endeavour Energy EDPR*, May 2023, p. 4.

<sup>27</sup> Public Interest Advocacy Centre, *Issues Paper 2024–29 Revenue Determinations: Ausgrid, Endeavour and Essential Energy*, June 2023, pp. 15-16.

## A.4.2 Endeavour Energy’s proposal

Endeavour Energy proposed \$50.1 million of capex for CER integration investments. It also proposed \$20 million for opex step changes related to CER integration (assessed in Attachment 6).

The proposed capex is for low voltage (LV) augmentation (\$32.7 million), distributed energy resource management system (DERMS) and flexible exports (\$12.4 million) and distribution transformer monitoring (\$5 million). Endeavour Energy claims that its proposed investments will unlock an estimated 6,000 GWh of renewable energy that would otherwise be lost to curtailment.<sup>28</sup>

Endeavour Energy states that under its DER vision it will enable its customers to flexibly use their DER to meet their own energy needs as well as to trade surplus energy into emerging DER markets. To do this, it will advance its network operations to transition from a DNSP to a Distribution System Operator role, playing an active role in facilitating and maximising two-way energy flows while maintaining network security and reliability.

Endeavour Energy’s customer engagement revealed that customers are keen to be involved in the transition to a low carbon economy and want Endeavour Energy to take steps to prepare for an accelerated transition.

Currently, 23% of Endeavour Energy’s residential customers have rooftop solar. Endeavour Energy forecasts that this figure will increase to 42% by 2030, based on AEMO’s 2022 Integrated System Plan (Step Change scenario).<sup>29</sup>

## A.4.3 Reasons for decision

We assessed Endeavour Energy’s “DER integration strategy and business case”, supporting documents, models and responses to our information requests.<sup>30</sup> EMCa also reviewed the prudence and efficiency of the proposed expenditure, with a focus on whether Endeavour Energy sufficiently demonstrated the need for network investment to accommodate forecast levels of CER.<sup>31</sup>

We assessed the proposed CER integration expenditure against our guidance note and the customer export curtailment value (CECV) methodology. Our guidance note outlines the types of benefits that may be realised and how DNSPs should quantify them.<sup>32</sup> Relatedly, we apply the CECV methodology to derive CECVs, which we expect DNSPs to use when estimating wholesale electricity market benefits associated with their proposed investments.<sup>33</sup>

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<sup>28</sup> Endeavour Energy, *10.40 DER Integration Strategy*, January 2023, p. 8.

<sup>29</sup> Endeavour Energy, *10.39 Future Grid Strategy*, January 2023, p. 5.

<sup>30</sup> This included “Attachment 10.39 – Future Grid Strategy”, “Attachment 10.40 – DER integration strategy” and “DER expenditure model”.

<sup>31</sup> EMCa, *Report to AER on Endeavour Energy’s DER and ICT 2024–29*, August 2023.

<sup>32</sup> AER, [DER integration expenditure guidance note](#), June 2022.

<sup>33</sup> AER, [Customer export curtailment value methodology](#), June 2022.

Our assessment focused on:

- Hosting capacity analysis. DNSPs should study the networks' ability to accommodate more CER connections without experiencing voltage or thermal violations. The output of this analysis is a forecast of export curtailment.
- Options analysis. The preferred investment option should be a credible option which maximises the net economic benefits, relative to a "BAU" base case scenario.
- Benefit quantification. DNSPs should quantify credible types of benefits and use appropriate input assumptions to quantify benefits.

Overall, in coming to our draft decision, we found that Endeavour Energy has demonstrated there is a need for some level of investment based on its hosting capacity analysis, and it has considered a reasonable range of investment options to integrate CER. However, our analysis and EMCa's review found a number of issues with its modelling which reduced our confidence in the reliability of the model producing a prudent and efficient outcome.

Our alternative capex estimate for CER integration is \$37.5 million, on the basis that of the issues we have identified with Endeavour Energy's modelling to justify LV augmentation, which overstates the justified level of capex. However, as discussed in section 5.3, when we considered the total of our category level alternative estimates, we found that our alternative forecast at the total capex level was not materially different from Endeavour Energy's total forecast.

### **Hosting capacity analysis**

Endeavour Energy developed an LV simulation tool in partnership with the University of Wollongong's Australian Power Quality and Reliability Centre. The tool uses an open-source electrical power flow engine to run time-series power flow simulations. Load and voltage profiles are analysed to quantify network constraints, and intervention options are then modelled to measure how much they alleviate these constraints.

Endeavour Energy has applied static export limits of 5kW (for a single-phase system) since 2015, which will continue to apply in RCP 2024–29. It noted that the level of compliance with this export limit is only 22%, since a significant number of inverters are not compliant with volt-var and overvoltage tripping settings under AS4777. However, in its base case scenario it assumed that all new rooftop solar inverters will be compliant to AS4777.2020 power quality response modes. To develop an alleviation profile, Endeavour Energy estimated the difference in energy exported when customers are limited to 5kW and when they are unconstrained.

EMCa concluded that the simulation tool is fit for purpose, the input assumptions are credible and the approach to forecasting the level of curtailment is reasonable.<sup>34</sup>

### **Options analysis**

Endeavour Energy identified eight solutions and modelled them sequentially to avoid double counting benefits. The proposed solutions include:

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<sup>34</sup> EMCa, *Report to AER on Endeavour Energy's DER and ICT 2024–29*, August 2023.

- LV visibility and analytics – the purchase of smart meter data and the deployment of distribution substation monitors and the scaling of analytics platforms to support this data (assessed in the Attachment 6 - Opex).
- Tariff reform – the implementation of cost reflective tariffs. Endeavour Energy proposes to introduce export tariffs and rewards and its forecast expenditure is included in its estimate of export long-run marginal cost.
- Hot water solar soaking – the use of hot water systems under smart meter control to use excess solar generation (assessed in Attachment 6 - Opex).
- Phase balancing – correcting customer connection phase imbalance to unlock additional hosting capacity.
- Distribution transformer tap optimisation – set the remaining 62% of unoptimised transformers to their optimal tap position.
- Dynamic voltage management – implement real-time closed loop voltage control at all zone substations.
- Network investment – including traditional augmentation, static synchronous compensators (STATCOMs) and network support batteries.
- Dynamic operating envelopes – calculate and dynamically allocate hosting capacity to DER allowing customers to install larger systems and export above static limits.

The proposed solutions include a number of pilot activities in the current regulatory control period. EMCa noted that this is generally a prudent first step and the current program of works can provide a measure of confidence in the proposed costs, benefits and optimal investment timing.<sup>35</sup>

Endeavour Energy's strategy for improving inverter compliance is to introduce dynamic operating envelopes. EMCa noted that this will progressively improve inverter compliance and equity of export access, which seems to be a reasonable strategy.<sup>36</sup> However, if the uptake of dynamic operating envelopes is slower than forecast, this issue will persist for much longer and may warrant alternative action to improve hosting capacity and equity amongst customers. In our view, the actions recommended by the AEMC<sup>37</sup> (including the introduction of commissioning sheets) are likely to deliver more immediate benefits at a lower cost, and Endeavour Energy should consider these actions prior to investing to enable dynamic operating envelopes. For example, improving inverter compliance will enable Endeavour Energy to set higher static export limits and allow customers to export more of the electricity they generate.

### **Benefit quantification**

Endeavour Energy's cost-benefit analysis model illustrates an NPV of \$55.9 million for the entire investment program and positive NPVs for each of the proposed solutions. However,

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<sup>35</sup> EMCa, *Report to AER on Endeavour Energy's DER and ICT 2024–29*, August 2023, p. 20.

<sup>36</sup> EMCa, *Report to AER on Endeavour Energy's DER and ICT 2024–29*, August 2023, p. 26.

<sup>37</sup> AEMC, [Review into consumer energy resources technical standards, Final report](#), September 2023, p. 36.



our analysis and EMCa’s review found a number of errors in the model. In particular, EMCa found that:

- The model is flawed in its representation of NPVs.<sup>38</sup> The concept of discounting (to produce present values) appears to be conflated with inflation-related adjustments. Benefits ascribed to each year in the forecast regulatory control period includes benefits to be realised in those years as well as NPVs of future benefits. Finally, costs beyond the forecast regulatory control period are not considered in the NPV analysis.
- The method Endeavour Energy used to determine its proposed distribution substation augmentation expenditure is flawed.<sup>39</sup> The model incorporates flawed logic on the optimum timing to undertake works that are determined on the basis of their economic value. After adjusting the model, the justified level of augmentation is reduced to around \$20 million.
- The basis for some benefits is unclear or unsupported by evidence.<sup>40</sup>

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<sup>38</sup> EMCa, *Report to AER on Endeavour Energy’s DER and ICT 2024–29*, August 2023, p. 29.

<sup>39</sup> EMCa, *Report to AER on Endeavour Energy’s DER and ICT 2024–29*, August 2023, p. 30.

<sup>40</sup> EMCa, *Report to AER on Endeavour Energy’s DER and ICT 2024–29*, August 2023, p. 32.

## A.5 Innovation Fund

### A.5.1 AER’s draft decision

We do not consider Endeavour Energy has adequately justified its proposed innovation fund against the capex criteria.

### A.5.2 Endeavour Energy’s proposal

Endeavour Energy proposed its Innovation Fund comprising \$20 million capex (and a \$5 million ‘use it or lose it’ true-up mechanism).

Endeavour Energy proposed its Innovation Fund around four investment themes:<sup>41</sup>

- Orchestration and distribution system operator
- Electric vehicles services
- Sustainability solutions
- Climate resilience

The Independent members of the RRG provided strong in-principle support for establishment of the program and the proposed amount, subject to further details regarding oversight and ongoing engagement, including the establishment of an Innovation Reference Group.<sup>42</sup>

### A.5.3 Reasons for decision

We do not consider that Endeavour Energy has demonstrated its Innovation Fund capex of \$20 million (and its \$5 million ‘use it or lose it’ true-up mechanism) is prudent and efficient.

In coming to our position, we found a lack of information to support the prudence and efficiency of the capex associated with its Innovation Fund including what projects would be included in that fund. There were differing stakeholder views on the proposed Innovation Fund capex. While there was support for the Innovation Fund from Endeavour Energy’s RRG, PIAC submitted:<sup>43</sup>

While we can see the merit in investigating and trialling emerging technologies and network solutions, we question the extent to which activities falling under the broad umbrella of ‘innovation’ are already funded through regulatory allowances or other incentive mechanisms. Our concern with discrete innovation funding is not just limited to Endeavour’s proposal and is grounded in an understanding that innovation should be seen as a response or ‘tool’ rather than an output, that is desirable in its own right.

Innovative responses to problems or issues tend to result from a need to overcome resource or circumstantial constraints, rather than the provision of extra resources earmarked for ‘innovation’. It is critical that innovation programs are transparent about how proposed funding is to be used, what issues are

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<sup>41</sup> Endeavour Energy, *9.05 Innovation Investment Proposal 2024–29*, December 2022, p. 4.

<sup>42</sup> Endeavour Energy, *9.05 Innovation Investment Proposal 2024–29*, December 2022, p. 3.

<sup>43</sup> PIAC, *Submission in response to the AER issues paper for NSW DNSPs*, June 2023, p. 11.

being investigated, what purpose innovation needs to serve (for instance, to derive benefits for non-solar customers from network batteries), and how consumers are intended to benefit from said innovation.

Our decision does not limit Endeavour Energy from investing in the Innovation Fund in the 2024–29 period, as we do not approve individual projects or programs.

Below we set out some guidance for Endeavour Energy to consider in future regulatory proposals:

- Describe the type of projects and programs by providing information on the identified need, scope of works, costs, options and expected benefits. Further, clearly demonstrate why the projects are transformative rather than core improvement and efficiency that should be part of normal business operations. We note Endeavour Energy has sought to make this distinction between potentially transformative innovation and the more traditional productivity or efficiency improvements.<sup>44</sup>
- Clearly explain how the existing incentive schemes, allowances, government grants and regulatory sandboxing have been considered and genuinely exhausted before considering an expenditure forecast to fund the proposed innovation. This is to minimise duplication and ensure the appropriate alternative funding arrangements are utilised. Endeavour Energy noted that the proposed fund is incremental to the demand management innovation allowance (DMIA), and Endeavour Energy will seek to leverage alternative funding from grants such as from ARENA, government, or RACE for 2030.<sup>45</sup>
- Demonstrate how the findings and lessons learnt from any progress reports or post implementation reviews in the 2024–29 period have been used to inform and refine other projects. Further, demonstrate how the benefits of any innovation projects are incorporated into the remainder of the proposal or are likely to be incorporated in future proposals, such as through lower repex, augex or opex.
- Explain how the knowledge from the innovation projects will be shared with industry, consumers, and the regulator. Knowledge sharing is critical to minimise duplication between network service providers. Endeavour Energy acknowledges this importance of communicating successes and failures to minimise duplication and customers paying twice.<sup>46</sup> Where similar projects have been undertaken by others, Endeavour Energy should demonstrate how any shared lessons have been considered and used to inform the proposed project, and what the incremental benefit of Endeavour Energy's project is.
- Whether Endeavour Energy is the appropriate party to undertake the proposed innovation compared to a contestable market participant and if there are any ring-fencing concerns. An industry approach to innovation is important such as that facilitated through the Energy Innovation Toolkit or ARENA,<sup>47</sup> so that the appropriate participants undertake the innovation and duplication is minimised.

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<sup>44</sup> Endeavour Energy, *9.05 Innovation Investment Proposal 2024–29*, December 2022, pp. 3, 9–10.

<sup>45</sup> Endeavour Energy, *9.05 Innovation Investment Proposal 2024–29*, December 2022, p. 4.

<sup>46</sup> Endeavour Energy, *9.05 Innovation Investment Proposal 2024–29*, December 2022, p. 17.

<sup>47</sup> Australian Government, [Energy Innovation Toolkit](#).

The above is guidance and is not intended to be exhaustive or definitive. Overall, if innovation expenditure is to be included in an expenditure forecast, then Endeavour Energy should demonstrate it addresses the expenditure objectives, satisfies the expenditure criteria and is in the long term interest of consumers.

## B 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.<sup>48</sup> 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.<sup>49</sup>

The NER require the review period to be:<sup>50</sup>

- 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:<sup>51</sup>

- when a distribution business has overspent, the amount of capex above the total capex forecast 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 distribution business's capitalisation policy has led to opex being capitalised, the capitalised opex can be excluded from the RAB.

### B.1 Position

We are satisfied that Endeavour Energy's capital expenditure in the 2017–18 to 2021–22 regulatory years should be rolled into the RAB.

### B.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:<sup>52</sup>

- Stage one — initial consideration of actual capex performance

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<sup>48</sup> NER, cl. 6.12.2(b).

<sup>49</sup> NER, cl. 6.4A(a).

<sup>50</sup> NER, cl. S6.2.2A(a1).

<sup>51</sup> NER, cl. S6.2.2A(b).

<sup>52</sup> AER, *Capital Expenditure Incentive Guideline*, November 2013, pp. 19–22.

- Stage two — detailed assessment of drivers of capex and management and planning tools and practices.

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

- a distribution business had overspent against its forecast;
- 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.

### B.3 AER assessment

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

Endeavour Energy incurred total capex above its forecast regulatory forecast in these regulatory years. Therefore, the overspending requirement for an efficiency review of past capex is satisfied.<sup>53</sup>

As part of our assessment, we have considered the overspend in 2017–18 and 2018–19 in the context of Endeavour Energy's total capex outcome for the 2014–19 regulatory control period. As can be seen in Figure 5.1, while 2017–18 and 2018–19 actual capex is about \$200 million higher than our decision, 2014–15 to 2016–17 actual capex is about \$400 million lower such that the total capex spent for the 2014–19 regulatory control period is lower than our decision.

As noted in Endeavour Energy's proposal, it has experienced significant growth over the last decade and expects this to continue. Furthermore, certain expenditure requirements (augex) have been brought forward or deferred within the period and between periods driven by forces outside its control (customer driven developments).<sup>54</sup>

We are cognisant of the need for distribution businesses to incur expenditure as required and be flexible when circumstance changes in any given regulatory control period. While Endeavour Energy has overspent in 2017–18 and 2018–19, we found no evidence that the capital expenditure criteria have not been met.

Based on the information before us, we are satisfied that including Endeavour Energy's actual capex in the 2017–18 to 2021–22 regulatory years into the RAB is likely to contribute towards achieving the capex incentive objective.

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<sup>53</sup> NER, cl. S6.2.2A(c).

<sup>54</sup> Endeavour Energy, *Endeavour Energy – 0\_01 Regulatory Proposal - January 2023*, January 2023, p.178.

## Shortened forms

Term	Definition
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulatory
AESCF	Australian Energy Sector Cyber Security Framework
AS	Australian standard
augex	augmentation expenditure
capex	capital expenditure
CCP26	Consumer Challenge Panel, sub-panel 26
CCT	covered conductor thick
CECV	customer export curtailment value
CER	customer export services
CESS	capital expenditure sharing scheme
CFI	case for investment
CIRMP	critical infrastructure risk management program
DER	Distributed Energy Resources
DERMS	distributed energy resource management system
DNSP or distributor	Distribution Network Service Provider
EMCa	Energy Market Consulting associates
GWh	gigawatt hour
ICT	information and communication technologies
kW	kilowatt
LV	low voltage
NEL	National Electricity Laws
NEO	National Electricity Objectives
NER	National Electricity Rules
NPV	net present value
NSP	network service provider
opex	operating expenditure
PIAC	Public Interest Advocacy Centre
RAB	regulated asset base

<b>Term</b>	<b>Definition</b>
RCP	representative concentration pathway
repex	replacement expenditure
RIT-D	regulatory investment test for distribution
RIT-T	regulatory investment test for transmission
RRG	Regulatory Reference Group
SCS	standard control service
SP-2	security profile 2
STATCOMs	static synchronous compensators
WSROC	Western Sydney Regional Organisation of Councils

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