FINAL DECISION

Energex
Distribution Determination
2020 to 2025

Attachment 5
Capital expenditure

June 2020

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: 1300 585 165
Email: EnergyQueensland2020@aer.gov.au

AER reference: 62727

Note

This attachment forms part of the AER's final decision on the distribution determination that will apply to Energex for the 2020–25 regulatory control period. It should be read with all other parts of the final decision.

The final decision includes the following attachments:

Overview

Attachment 1 – Annual revenue requirement

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 4 – Regulatory depreciation

Attachment 5 – Capital expenditure

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 8 – Efficiency benefit sharing scheme

Attachment 9 – Capital expenditure sharing scheme

Attachment 10 – Service target performance incentive scheme

Attachment 12 – Classification of services

Attachment 13 – Control mechanisms

Attachment 14 – Pass through events

Attachment 15 – Alternative control services

Attachment 18 – Tariff structure statement

Attachment A – Negotiating framework

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. Generally, these assets have long lives and the distributor will recover capex from customers over several regulatory control periods. A distributor's capex forecast contributes to the return of capital 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 regulations, and to maintain the safety, reliability, quality, security of its network (the capex objectives).[1]

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).[2]

We must make our decision in a manner that will, or is likely to, deliver efficient outcomes that benefit consumers in the long term (the National Electricity Objective).[3]

The AER capital expenditure assessment outline explains the obligations of the AER and distributors under the National Electricity Law and Rules (NEL and NER) in more detail.[4] It also describes the techniques we use to assess a distributor's capex proposal against the capex criteria and objectives. The outline is part of the supporting information for this final decision.

This attachment sets out our final decision on Energex's revised total capex forecast. We have based our final decision on our analysis of the information and submissions we have received before and after Energex's revised proposal. We use real $2019–20 unless otherwise noted.

1 NER, cl. 6.5.7(a).
2 NER, cl. 6.5.7(c).
3 NEL, ss. 7, 16(1)(a).
4 AER, *AER capital expenditure assessment outline for electricity distribution determinations,* February 2020.

5.1 Final decision

We accept Energex's forecast capex of $2000.0 million for the 2020–25 regulatory control period.[5] We are satisfied that this forecast capex is consistent with the efficient costs that a prudent operator would incur in the 2020–25 regulatory control period and reasonably reflects the capex criteria.

Table 5.1 outlines Energex's revised total capex forecast and our final decision.

Table 5.1 Final decision on Energex's total net capex forecast ($ million, 2019–20)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Energex's revised proposal and AER final decision	414.0	403.1	405.5	392.2	385.2	2000.0

Source: AER analysis and Energex.

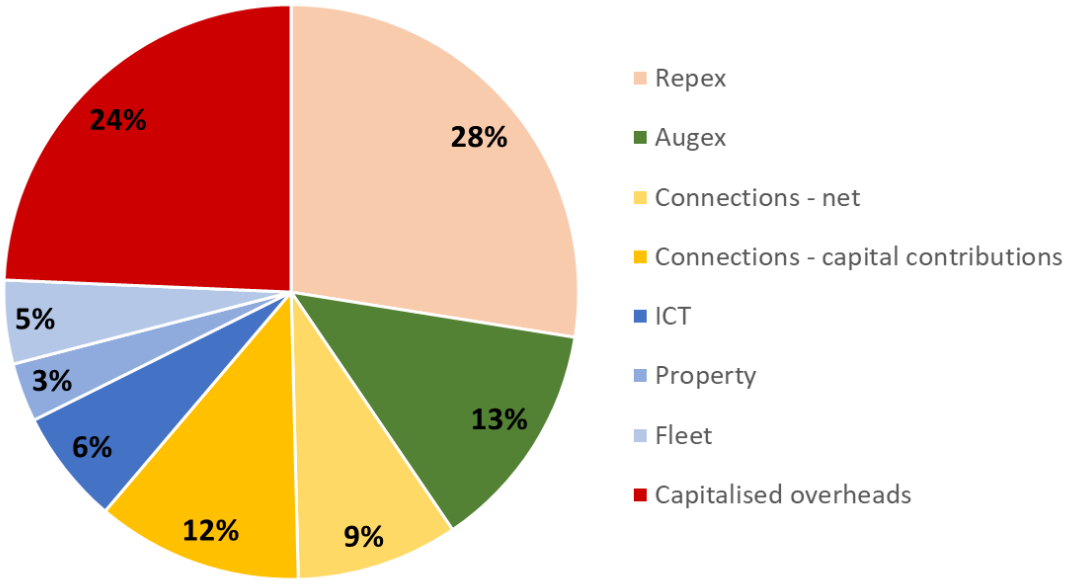
Notes: Numbers may not sum due to rounding. The figures above do not include equity raising costs, capital contributions and asset disposals. See attachment 3 for our assessment of equity raising costs.
Final decision net capex forecast is $9.9 million lower than what Energex submitted in its revised proposal. See footnote 5 for more detail.

5.2 Energex's revised proposal

Figure 5.1 shows Energex's revised gross capex (including capital contributions) proposal by capex driver.

[5] This figure is $9.9 million lower than Energex's $2010.0 million it forecast for net capex in its revised proposal. Following consultation Energex provided us with a revised forecast which corrected an escalation error in its capex model.

Figure 5.1 Energex's forecast total gross capex



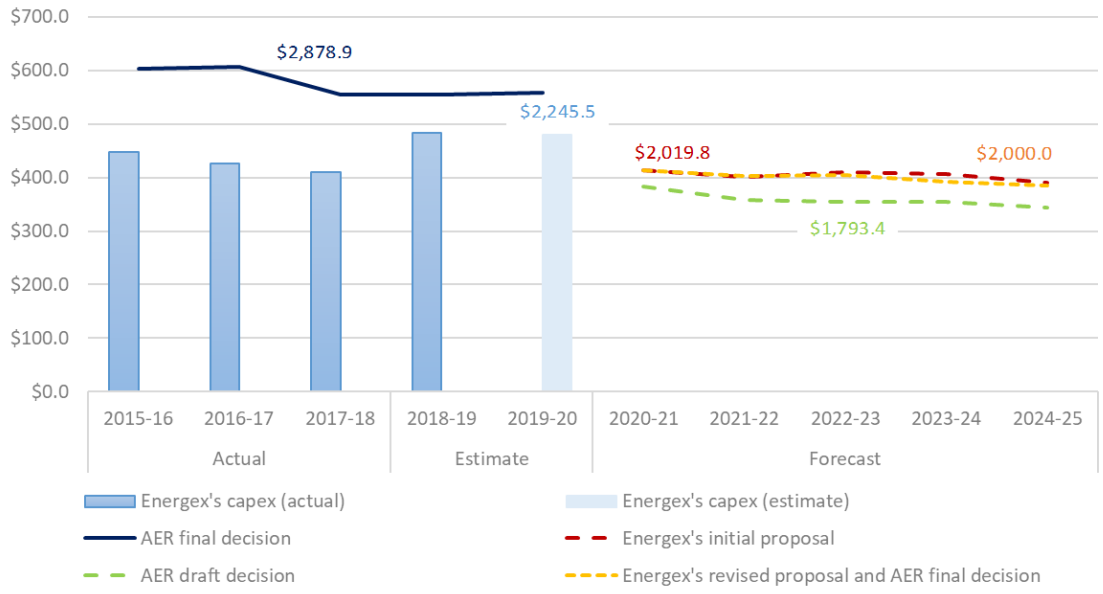
Source: AER analysis and Energex.

Note: Fleet includes other non-network capex.

The largest contributors to Energex's gross capex forecast are repex (28 per cent), capitalised overheads (24 per cent) and connections (21 per cent including capital contributions). Compared with the initial proposal, ICT as a share of total capex has decreased.

Figure 5.2 outlines Energex's historical capex performance against our final decision forecast for the 2015–20 regulatory period. This is compared to our final decision forecast, which accepts Energex's revised proposal. Energex's 2020–25 revised net capex forecast is $245.5 million (11 per cent) lower than its actual and estimated net capex of $2245.5 million for the 2015–20 regulatory control period.

Figure 5.2 Energex's historical vs forecast net capex snapshot ($ million, 2019–20)



Source: AER analysis and Energex.

Notes: Energex's historical forecast is not directly comparable to its recast actual data, initial capex forecast and the AER draft decision due to its cost allocation method and classification of services changes. Final decision net capex forecast is $9.9 million lower than what Energex submitted in its revised proposal. See footnote 5 for more detail.

Energex estimates that it will underspend its capex forecast by around $370 million (or around 13 per cent) for the 2015–20 regulatory control period.

5.3 Reasons for final decision

This section summarises our reasons for this final decision. We provide further detail in appendix A.

We acknowledge Energex's extensive consultation with us and its subsequent development of quantitative cost-benefit models to support its proposed capex program for 2020–25.

In our draft decision, we noted that Energex's proposal lacked sufficient supporting material to satisfy us that its proposed capex reasonably reflects the capex criteria. In its revised proposal, Energex has provided quantitative cost-benefit analysis for its major projects and those areas of its proposal that we did not accept in the draft decision. This additional information has allowed us to better assess the prudency and efficiency of the proposed capex.

In making our final decision we have also had regard to historical and current capex. Importantly, we note that Energex's net capex forecast is 11 per cent lower than Energex's actual/estimated net capex for 2015–20.

Table 5.2 sets out the capex amounts by driver that we included in our draft decision and in our final decision on Energex's total capex forecast for the 2020–25 regulatory control period.

Table 5.2 Draft and final decision on capex by driver for the 2020–25 regulatory control period ($ million, 2019–20)

Category	AER draft decision	AER final decision	Difference ($)	Difference (%)
Repex	$582.8	$630.8	$48.0	8%
Augex	$195.5	$297.6	$102.1	52%
Gross connections	$475.0	$474.6	-$0.4	0%
ICT	$146.0	$147.7	$1.7	1%
Property	$57.8	$76.0	$18.2	31%
Fleet	$86.0	$99.1	$13.1	15%
Other non-network	$8.9	$8.8	-$0.1	-1%
Overheads	$538.1	$557.7	$19.6	4%
Gross capex	**$2090.2**	**$2292.2**	$202.1	10%
less capcons	$267.3	$265.9	-$1.4	-1%
less disposals	$16.5	$16.4	-$0.1	-1%
less modelling adjustments	$13.0	$9.9	-$8.9	-68%
Net capex	**$1793.4**	**$2000.0**	$206.6	12%

Source: AER analysis.

Notes: Numbers may not add due to rounding.

Gross capex is before modelling adjustments are applied.

Compared with our draft decision, our final decision allows higher capex for most categories. In particular, the final decision provides for a significantly higher forecast for augex (52 per cent higher) and property capex (31 per cent higher). With its revised proposal Energex provided further quantitative analysis to support many of its proposed major projects under these drivers. The increase in capitalised overheads reflects higher expected support costs for the larger capex program under our final decision forecast.

Table 5.3 summarises our findings and the reasons for our final decision by capex driver. This reflects the way we have assessed Energex's total capex forecast. However, we use our findings on the different capex drivers to assess a distributor's proposal as a whole and arrive at a substitute estimate for total capex where necessary.

Table 5.3 Summary of our findings and reasons

Issue	Reasons and findings
Total capex consideration	Despite concerns with some projects and programs, we are satisfied that Energex's revised capex proposal reasonably reflects the capex criteria. Energex's forecast capex is lower than its current period (2015–20) spend.
Augex	Compared with our draft decision, Energex has provided more substantive supporting evidence of its key augex projects. As a result, we are satisfied that the majority of Energex's proposed augex program reasonably reflects the capex criteria. We still have concerns with a small number of projects proposed by Energex, including the intelligent grid enablement program. However, these concerns are not material when considered in the context of Energex's overall capex forecast.
Connections	Energex's revised new connections capex forecast is the same as our draft decision. We are satisfied that its forecast reasonably reflects the capex criteria.
Repex	We do not accept that Energex's proposed LV safety program is prudent and efficient. Despite this, we find that Energex's revised repex proposal as a whole contributes to an overall revised capex proposal that reasonably reflects the capex criteria.
ICT	Energex has considered our concerns about its initial proposal for IT capex and its revised proposal largely reflects our draft decision. We are satisfied that its forecast reasonably reflects the capex criteria.
We accept Energex's revised ICT capex forecast of $147.7 million. Its revised forecast is 2 per cent higher than our draft decision of $144.8 million, and 23 per cent lower than its initial proposal of $192.5 million. Energex accepted our draft decision on ICT capex subject to a minor modelling adjustment to our substitute for recurrent ICT capex. We accept Energex's proposed adjustment and therefore consider Energex's revised ICT capex to be prudent and efficient. Property	Energex has provided additional supporting information in its revised proposal to justify its property capex forecast. Despite some concerns about one project, we are satisfied that its forecast reasonably reflects the capex criteria.

Issue	Reasons and findings
Other non-network capex	In its revised proposal Energex has provided new modelling and assumptions to support its fleet capex forecast. We are satisfied that its forecast reasonably reflects the capex criteria.
Capitalised overheads	Energex has based its revised forecast of capitalised overheads on actual expenditure for the current period (2015–20) and has adopted our draft decision methodology. We are satisfied that its forecast reasonably reflects the capex criteria.
Modelling adjustments	In its revised proposal capex model Energex misclassified all of its capex labour costs as in-house labour, with no costs allocated to contractor labour. This resulted in real labour escalation being overstated by around $10 million. Energex acknowledged this error and re-submitted its capex and post-tax revenue models.

A Capex driver assessment

This appendix describes our detailed analysis for each of the capex drivers and the reasons for our final decision on Energex's forecast capex for 2020–25. We explain why we are satisfied that Energex's revised capex proposal reasonably reflects the capex criteria.

We use various qualitative and quantitative assessment techniques to assess the different elements of Energex's proposal to determine whether its proposal reasonably reflects the capex criteria.[6] More broadly, we also take into account the revenue and pricing principles set out in the NEL.[7] In particular, we take into account whether the overall capex forecast will provide Energex with a reasonable opportunity to recover at least the efficient costs it incurs to:

- provide direct control network services
- comply with its regulatory obligations and requirements.[8]

When assessing capex forecasts, we also consider:

- that the prudency and efficiency criteria in the NER are complementary and reflect the lowest long-term cost to consumers to achieve the expenditure objectives[9]
- past expenditure was sufficient for the distributor to manage and operate its network in previous periods, to the extent that it achieved the capex objectives[10]
- the capex required to provide for a prudent and efficient distributor's circumstances to maintain performance at the targets set out in the service target performance incentive scheme (STPIS)[11]
- the annual benchmarking report, which includes total expenditure and overall capex efficiency and considers a distributors' inputs, outputs and its operating environment
- the various interrelationships between the total capex forecast and other constituent components of the determination, such as forecast opex and STPIS interactions.[12]

---

6 AER, *AER capital expenditure assessment outline*, October 2019.

7 NEL, ss. 7A and 16(2).

8 NEL, s. 7A.

9 AER, *Better regulation: Expenditure forecast assessment guideline for electricity distribution*, November 2013, pp. 8–9.

10 AER, *Better regulation: Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 9.

11 The STPIS provides incentives for distributors to further improve the reliability of supply only where customers are willing to pay for these improvements.

12 NEL, s. 16(1)(c).

A.1 Total capex consideration

In our draft decision we observed that:[13]

> Energex's capex proposal lacked the necessary supporting material such as risk-based cost-benefit analysis with all feasible options considered, reasoning for the application of key inputs in the forecast, demonstration of a top-down challenge (or genuine testing of the forecast) and any other evidence to justify its forecast.
>
> …
>
> In its revised proposal we would encourage Energex to provide risk quantification in support of its proposed capex, consistent with good industry practice.

We commend Energex for responding to these comments. Energex has developed quantified cost-benefit analysis for a large number of its major projects. It engaged with us ahead of its revised proposal to discuss its approach and invited feedback from us.

We still have concerns with some elements of Energex's quantitative analysis. For example, in some cases we find that risk costs are overstated, resulting in a bias towards additional capex spend. In other cases, Energex has not adequately considered all credible options. Despite these concerns, the additional analysis provided in the revised proposal has allowed us to test the prudency and efficiency of its proposal against the capex criteria to a greater degree than we could in our draft decision.

A.2 Augex

The need to build or upgrade the network to address changes in demand and network utilisation typically trigger augex. However, the need to upgrade the network to comply with quality, safety, reliability and security of supply requirements can also trigger augex.

A.2.1 Final decision

We are satisfied that Energex's augex forecast reasonably reflects the capex criteria. In coming to this position we focussed on the incremental differences between our draft decision and Energex's revised proposal.

Energex has not demonstrated that the full scope of the proposed sub-transmission growth, power quality, and network communications augex programs are prudent and

[13] AER, *Energex Distribution determination 2020 to 2025 – Attachment 5 Capital expenditure*, October 2019, pp. 5-14–5-15.

efficient. However, in the context of Energex's historic augex levels[14] and overall total capex forecast we are satisfied that Energex's forecast augex forms part of a capex forecast that reasonably reflects the capex criteria.

A.2.2 Energex's proposal

Energex revised its augex forecast to $297.6 million for the 2020–25 regulatory control period. This represents a 1 per cent decrease relative to its $301.1 million initial proposal. It resubmitted all business cases with additional supporting information, and revised down the proposed expenditure for the Intelligent Grid Enablement project.

A.2.3 Reasons for final decision

We consider the majority of Energex's revised augex forecast is prudent and efficient. Energex presented revised business cases and additional supporting evidence for most of those projects that we did not accept in the draft decision. We highlight below our review and residual concerns about the sub-transmission growth, power quality and network communications augex programs.

Sub-transmission growth augmentation

Energex responded to concerns we raised in our draft decision on the proposed sub-transmission growth augmentation projects.[15] We reviewed the following four projects and provide the following comments:

- **Bells Creek Central zone substation –** Energex's modelling indicates that its preferred solution (option 2) would incur the lowest present-value cost.[16] We consider total costs between option 2 and option 1 (to continue construction of 11kV feeders from Caloundra substation) may be more comparable than the modelling suggests. Energex's estimate of unit cost of feeder augmentation under option 1 appears to be at the high end of the reasonable cost range, while it appears Energex may have underestimated the cost of building HV feeders from a newly constructed Bells Creek Central zone substation.

  Energex's model does not include an assessment of benefits and it is therefore difficult to ascertain the optimal timing for investment. Energy Consumers Australia (ECA) and its consultant Dynamic Analysis submitted that it was not clear how Energex was accounting for uncertainty in connection numbers or size.[17] We consider there is merit in continuing the construction of feeders until Energex has better information on forecast connections.

---

[14] Energex's $297.6 million forecast is 29 per cent lower than the $419.6 million it expects to incur during the 2015–20 regulatory control period.

[15] AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25,* October 2019, pp 5-17–5-20.

[16] Energex, *Revised proposal business case – Bells Creek attachment 1*, December 2019.

[17] Energy Consumers Australia, *ECA submission on Energy Queensland revised proposals*, January 2020, p. 2; Dynamic Analysis, *Technical report on Energex revised proposal*, January 2020, p. 8.

- **Establish Petrie zone substation –** In our draft decision, we considered that the option to upgrade Kallangur zone substation was the most efficient solution because Energex would be replacing transformers reaching end of life.[18] Energex has explained that the preferred option to establish Petrie zone substation also provides the benefit of reduced transformer replacement at Kallangur zone substation, relative to the base case.[19] Based on this additional information we recognise that establishing Petrie zone substation is the more efficient solution.
- **Abermain to Amberley - new 33kV feeder; Doboy to Queensport - new 33kV feeder –** we remain concerned with Energex's interpretation of its safety net targets.[20] We do not consider that Energex would be non-compliant with most targets in the event of a credible contingency.[21] To avoid future differences in interpretation, we recommend that the wording of the Ergon Energy safety net targets are adopted following the next review of the Energex targets.[22]

Power quality

Energex's revised model for its power quality monitoring program includes savings associated with avoiding the installation of new voltage regulators.[23] We consider that Energex should not have included this benefit, but instead have included the avoided cost for manually collecting voltage performance data only. If Energex has been installing voltage regulators unnecessarily without manual collection of voltage performance data, then we would consider that those investments were not prudent. When we make this adjustment to the model, this program becomes NPV negative and therefore the base case of not undergoing the power quality program is the preferred option.

Networks communications augex

Evidence gaps remain in Energex's network communications augex program. Dynamic Analysis is generally supportive of Energex's networks communications programs, but shares our view that "there are still residual evidence gaps that Energex may be able to close."[24]

---

18 AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25*, October 2019, pp 5-18–5-19.

19 Energex, *Revised proposal business case – Establish Petrie substation*, December 2019, p. 10.

20 Queensland Government, *Distribution Authority No. D07/98 issued to Energex Limited*, October 2019, p. 18.

21 It appears to us that Energex would be compliant with most safety net targets it has cited. We understand the targets allow an interruption to supply in urban areas that is greater than 40 MVA for 30 minutes (Abermain to Amberley), and greater than 12 MVA for three hours (Doboy to Queensport). Energex forecasts 47MVA and 9 MVA of interrupted supply for the respective projects and within the respective timeframes. Energex also cites a safety net breach of 5 MVA after eight hours for the Doboy to Queensport proposal. We recognise this would be a breach of the safety net target. See Energex, *Revised proposal business case – Abermain to Amberley supply reinforcement, December 2019*, pp. 5, 28; Energex, *Revised proposal business case – 33kV feeder SSDBS to SSQPT*, December 2019, pp. 3, 21.

22 Queensland Government, *Distribution Authority No. D01/99 issued to Ergon Energy Corporation Limited*, October 2019, p. 19.

23 Energex*, Revised proposal business case – power quality*, December 2019, pp. 28–32.

24 Dynamic Analysis, *Technical report on Energex revised proposal*, January 2020, p. 8.

We continue to hold concerns with the two network communications projects that we did not include in our draft decision:[25]

- **Intelligent grid enablement –** Energex addressed our key concerns[26] for two of the six projects that make up this program, by showing that they are NPV positive. This relates to projects to create a low-voltage management system and to enable better analysis of data ('real-time analytics'). Energex quantified the value of the exports that static limits would otherwise constrain without these projects.[27] We encourage Energex to share learnings from implementing these projects and to work with other distributors and the Australian Energy Market Operator to adopt best practice technical approaches.

  However, Energex has not sufficiently addressed our concerns for the remaining four projects. Its proposed DER management system would allow large business customers to increase electricity exports, but did it not quantify benefits from this. It also did not quantify benefits from improving its demand management systems. For the Digital Control Room Visualisation and Digital Power Worker Network Awareness projects, Energex did not quantify any efficiency benefits or otherwise demonstrate the need for these projects under the NER.[28]

- **Back-up protection –** Energex has demonstrated some need for backup protection augmentation, but has not fully addressed the concerns we raised in our draft decision.[29]

  Energex reiterated a need under NER cl. S5.1.9 to ensure backup systems are in place to detect and automatically clear any given fault.[30] We also received a submission from the Queensland Electrical Safety Office supporting the proposed program, referencing NER clause S5.1.9 and the need to ensure primary and backup protection systems are in place.[31]

  We recognise that Energex needs to address protection schemes that do not provide adequate safety and asset protection outcomes. However, Energex's business case is based on a desktop analysis to identify protection shortfalls based on its internal technical standards.[32] We do not consider that Energex can treat its internal technical standards as a compliance requirement. To justify this program Energex needs to demonstrate that its current protection schemes do not effectively protect network assets or do not ensure public safety. Further, in the absence of field testing that supports the desktop analysis, we do not have

---

25 AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25*, October 2019, pp. 5-24–5-25.

26 AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25*, October 2019, p. 5-24.

27 In its response to information request #069 Energex states that these two projects would be sufficient to realise the quantified benefits (Q10 p. 18). In its response to information request #080 Energex also provided the NPV of these projects alone, showing that this is the highest NPV option (Q2 p.1).

28 Energex, *Business Case – Intelligent Grid Enablement*, December 2019, pp. 17–19.

29 AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25*, October 2019, p. 5-25.

30 Energex, *Revised proposal business case – backup reach program*, December 2019, p. 7.

31 Queensland Electrical Safety Office, *Submission on EQL draft determination*, January 2020, p. 2.

32 Energex, *Revised proposal business case – backup reach program*, December 2019, p. 7.

confidence that the desktop analysis represents an accurate estimate of backup protection shortfalls.

A.3 Connections

Connections capex is expenditure incurred to connect new customers to the network and, where necessary, augment the shared network to ensure there is sufficient capacity to meet new customer demand.

A.3.1 Final decision

We are satisfied that Energex's net connections capex forecast of $208.7 million and contributions forecast of $265.9 million would form part of a total capex forecast that reasonably reflects the capex criteria.

A.3.2 Energex's proposal

We accepted Energex's original connections proposal in our draft decision. Energex updated its initial forecast with minor modelling adjustments.[33]

A.3.3 Reasons for final decision

CCP14 identified that Energex had appeared to update its forecast of net new customers, but had not revised the associated connections capex forecast.[34] Energex explained that it used a different definition of customer numbers,[35] and that it based its forecast on a level of activity that is low relative to historical levels.[36] We are satisfied with Energex's explanation and have included its revised connections capex estimate in our substitute forecast.

A.4 Repex

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

- an asset fails while in service or presents a real risk of imminent failure

---

33 Energex's revised proposal, p. 30.

34 CCP14, *Advice to the AER on the Energex and Ergon Energy 2020–25 revised regulatory proposals*, January 2020, pp. 28–29.

35 Energex originally used the economic benchmarking regulatory information notice definition of customers which counts both energised and de-energised national metering identifiers (NMIs). In its response to information request #076 Energex stated that it excluded de-energised NMIs in its revised proposal, aligning the definition of customers with network pricing (pp. 3–4).

36 Energex, response to information request 076 (follow-up), p. 2.

- a condition assessment of the asset 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[37]
- 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.

A.4.1 Final decision

We are satisfied that the majority of Energex's repex forecast reasonably reflects the capex criteria. Additional information provided by Energex in the revised proposal justifies its proposed asbestos removal program.

Energex has not demonstrated that its proposed LV network safety program is prudent and efficient, or required by health and safety legislation. However, in the context of Energex's overall total capex forecast we are satisfied that Energex's forecast repex forms part of a capex forecast that reasonably reflects the capex criteria.

A.4.2 Energex's proposal

Energex proposed $630.8 million for repex for the 2020–25 regulatory control period. This is $12.6 million, or 2 per cent, lower than its initial proposal. The lower forecast in the revised proposal is due to a reduction in the scope of Energex's proposed LV network safety program.

The largest asset groups by forecast expenditure is poles ($122 million or 19 per cent of total repex), followed by transformers ($112 million or 18 per cent).

A.4.3 Reasons for final decision

We have applied several techniques to assess Energex's repex forecast against the capex criteria, including trend analysis, predictive repex modelling and consideration of bottom-up and top-down methodologies, such as business cases and top-down challenges or constraints.

Additionally, we have had regard to technical advice and stakeholder submissions from the Consumer Challenge Panel (CPP14), Dynamic Analysis, the Queensland Electrical Safety Office and the Electrical Trade Union.

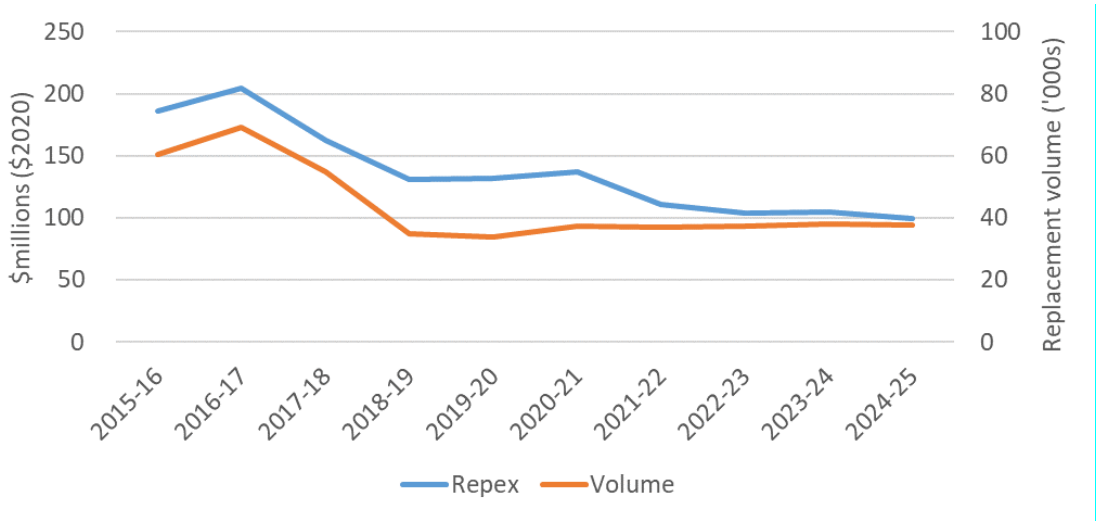
[37] A condition assessment may relate to assessment of a single asset or a population of similar assets. High value/low volume assets are more likely to be monitored on an individual basis, while low value/high volume assets are more likely to be considered from an asset category-wide perspective.

Total repex

We must have regard to actual and expected capital expenditure during any preceding regulatory control period.[38] Trend analysis of a distributor's past expenditure allows us to draw general observations about how a business is performing and provides a sanity check against our predictive modelling results. For some repex categories, where past expenditure was sufficient to achieve the capex objectives, this can be a reasonable indicator of whether the forecast repex is reasonable.[39]

Figure 5.3 shows that forecast annual repex and replacement volumes are lower than the current regulatory control period.

Figure 5.3 Energex's annual historical and forecast repex by asset group ($ million, 2019–20)



Source: AER analysis and Energex.

Note: The chart excludes 'other repex' because this asset group includes a number of large, non-recurrent projects that may obscure the underlying repex trends.

Assessment of top-down and bottom-up methodologies

We outlined our concerns with Energex's forecasting methodology and lack of risk quantification in our draft decision. In its revised proposal Energex has provided more quantitative risk analysis for the two repex projects that we excluded from our capex draft decision. We discuss the proposed LV network safety and asbestos prioritised removal programs below.

We also outlined our concerns with Energex's top-down methodology in our draft decision. We noted that a top-down challenge based on tariff targets may not reflect the needs of the network and therefore may lead to a capex forecast that does not

[38] NER, cl. 6.5.7(e)(5).

[39] AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 7–9.

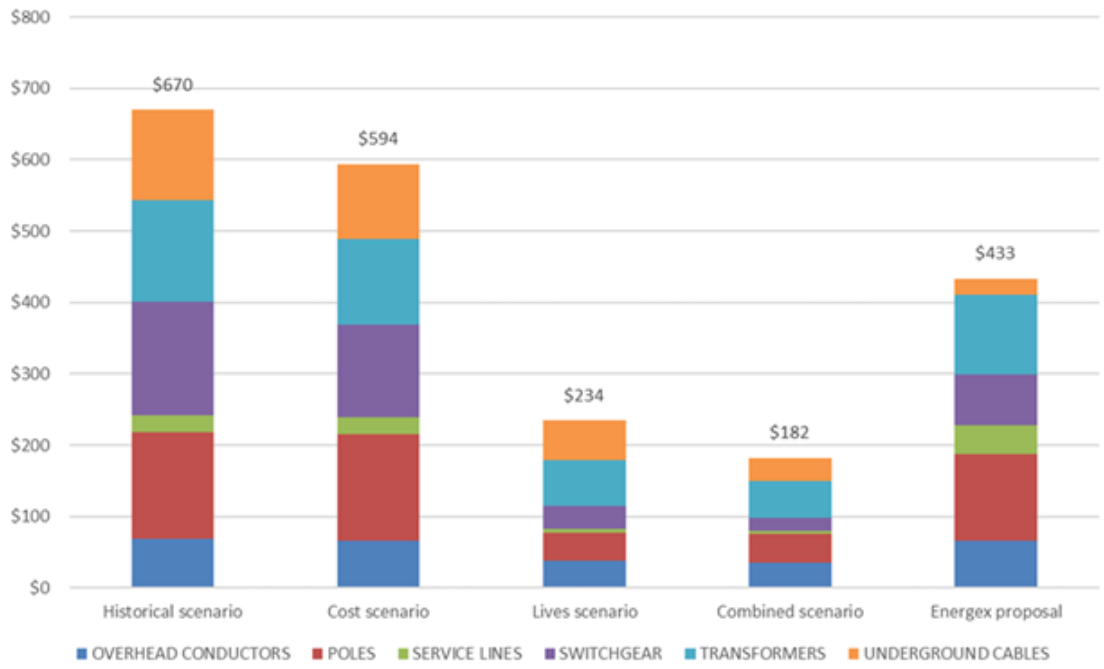
reasonably reflect the capex criteria. One key difference from the initial proposal is Energex's reversal of its commitment to forego its entitlements under the capital expenditure sharing scheme.

Modelled repex

Energex included $433.2 million for modelled repex in its revised proposal. We are satisfied that Energex's forecast modelled repex forms part of a forecast for total capex that reasonably reflects the capex criteria.

Figure 5.4 shows the outcomes from the scenario analysis. Energex's forecast of $433.2 million for modelled repex is 27 per cent lower than our repex model threshold—the cost scenario—of $594 million.

Figure 5.4 Output of the repex modelling scenario comparison ($ million, 2019–20)



Source: AER analysis.
Notes: Historical Scenario uses historical unit costs and calibrated expected replacement lives.
Cost Scenario uses comparative unit costs[40] and calibrated expected replacement lives.
Lives Scenario uses historical unit costs and comparative expected replacement lives.[41]
Combined Scenario uses comparative unit costs and comparative expected replacement lives.

Our final decision modelling includes 2018–19 CA RIN data. This has contributed to slightly different results for the historical and cost scenarios

[40] Minimum of a distributor's historical unit costs, its forecast unit costs and the median unit costs across the NEM.
[41] Maximum of a distributor's calibrated replacement life and the median replacement life across the NEM.

Unmodelled repex

Energex proposed $198.6 million for unmodelled repex for the 2020–25 regulatory control period. This forecast is $16.6 million, or 8 per cent, lower than its initial proposal of $215.2 million. The lower forecast in the revised proposal is due to a reduction in the scope of Energex's proposed LV network safety program.

In our draft decision we accepted most elements of Energex's repex forecast. However, Energex did not demonstrate that its LV network safety and asbestos prioritised removal programs reasonably reflected the capex criteria. We did not include these programs in our substitute estimate for total capex.

In its revised proposal Energex provided further justification, including quantitative modelling, for its LV network safety and asbestos prioritised removal programs. This additional information supports the inclusion of the asbestos prioritised removal program in the capex forecast. However, Energex has not demonstrated that its LV network safety program reasonably reflects the capex criteria.

LV network safety

Energex has not demonstrated the prudency and efficiency of the proposed LV network safety program for the 2020–25 regulatory control period.[42] Our position is consistent with our draft decision.

Energex proposed $32.6 million for LV network safety to reduce the safety risks caused by degradation or failure of neutrals (broken neutrals). This is $19.7 million less than it proposed in its draft decision and reflects a reduction in scope. In its draft decision Energex proposed to install 155 000 network monitoring devices (NMDs). In its final decision Energex proposed to install 95 000 NMDs. It did not provide details of how it arrived at this new volume.

In its revised proposal, Energex provided a revised business case[43] and quantitative cost-benefit analysis[44] to support the program. We commend Energex for its commitment to providing this information and its ongoing consultation with us ahead of its revised proposal.

We acknowledge the importance of investment to address safety risks and we have approved safety-related capex in previous decisions. However, we remain of the view that the costs of this program are grossly disproportionate to the benefits of mitigating the health and safety risks. Energex currently manages the safety risks associated with broken neutrals adequately and in line with industry good practice. There have been no incidents of serious injury or death caused by broken neutrals in Energex's network.

---

42 Ergon Energy proposed a similar program of works. See AER, *Final decision – Ergon Energy distribution determination 2020–25, Attachment 5 – capital expenditure*, April 2020.

43 Energex, *6.001 Business case LV Network Safety*, January 2020.

44 Energex provided this analysis in a confidential attachment to the revised proposal.

We have a number of concerns with Energex's business case and cost-benefit analysis. For example:

- We disagree with the assumptions used to quantify risks. Importantly, Energex has not based its assumptions about probability and consequence of risks on historical experience. Its forecast risk costs are overstated and do not reflect the consequence costs incurred by Energex as a result of neutral failure to date. An overstatement of the risks inflates the forecast repex required under the Work Health and Safety Act 2011 to mitigate that risk.
- Energex appears to have excluded recurrent capital costs for its preferred option. Over a 20-year period we would expect the majority of NMDs would require replacement, given their 10-year estimated service life. Inclusion of these capital costs reduces the net benefit of Energex's preferred option.

We raised our concerns about the quantitative modelling with Energex. It explained the basis for its risk assumptions, scope of works and asset management practices for its LV service lines.[45] This additional information did not satisfy us that its forecast risks are reasonable or that its preferred option was preferable to the counterfactual (its current practice of mitigating and addressing broken neutrals).

Stakeholder submissions

The CCP14 submits that it supports initiatives intended to address public safety risk in principle. However, it finds that Energex's business case lacks detail and it remains sceptical that the solution presented "is an efficient and effective way to address the risk." Therefore, it is "unable to support this proposal."[46]

Dynamic Analysis submits that Energex's proposal for LV network safety "still contains many evidence gaps." It raises a number of issues with the business case, including rationale behind project scope and risk prioritisation. It also asks the question why Energex now considers safety risks to be intolerable, despite being aware of the neutral integrity issues "for many years." [47]

The Queensland Electrical Safety Office supports Energex's LV safety program. It submits that the "current risk management approaches used by Energy Queensland have not adequately managed the risks" and that "advancements in remote monitoring technologies provide a practical means of improved risk management." [48]

---

45 Energex, response to information request 085.

46 Consumer Challenge Panel 14, *Advice to the AER on the Energex and Ergon Energy – 2020–25 Revised Regulatory Proposals (Revised Report)*, March 2020, pp. 31–32.

47 Dynamic Analysis, *Technical advice to Energy Consumers Australia – Review of Energex's revised regulatory proposal*, January 2020, p. 7.

48 Electrical Safety Office, *Comments to the Energex and Ergon Energy AER draft decision 2020–2025*, January 2020, pp. 1–2.

The Electrical Trades Union submits that "it is disgusted that both Ergon Energy and Energex must factor in the cost of a life in their calculations."[49] To clarify, a business is not required to place a value on human life, but instead to estimate the costs it may incur if a fatality takes place. The Health and Safety Executive concisely explain this principle:[50]

> In a CBA, all costs and benefits are expressed in a common currency, usually money, so that a comparison can be made between different options. It is a defined methodology for valuing costs and benefits that enables broad comparisons to be made between health and safety risk reduction measures on a consistent basis, giving a measure of transparency to the decision making process.

Asbestos prioritised removal plan

Energex proposed $8.5 million to proactively remove asbestos-containing material (ACM) as part of its corporate goal of being asbestos free (as far as is reasonably practicable) by 2025. Energex has demonstrated that this program forms part of a capex forecast that reasonably reflects the capex criteria.

In our draft decision we did not include this program in our substitute estimate as Energex did not demonstrate the need on economic, safety or legislative grounds. We noted that Energex's existing practices relating to undisturbed ACM are consistent with industry best practice and recommendations from Work Safe Australia and the Queensland Government.[51]

In its revised proposal Energex has submitted a business case for its proactive asbestos removal plan. It provided cost-benefit analysis which shows that it is most economical to remove all ACM by 2025.

While it is difficult to estimate the likelihood of ACM exposure under the counterfactual, we accept that it is probable that Energex will need to remove all ACM from its network over the next 20 years due to age-based degradation. We also accept that it is efficient to remove ACM proactively as it allows Energex to remove ACM before it becomes friable and removal works can be bundled with other required substation works where possible.

Dynamic Analysis notes in its submission that:[52]

> We consider that new information provided on the removal of asbestos from network assets is justified based on the known safety risks to Energex staff, and is therefore capable of acceptance.

---

49 Electrical Trades Union, *Submission – 2020–2025 AER Draft Determination*, January 2020.

50 Health and Safety Executive (UK), see https://www.hse.gov.uk/risk/theory/alarpcba.htm.

51 AER, *Energex Distribution determination 2020 to 2025 – Attachment 5 Capital expenditure*, October 2019, pp. 5-47–5-48.

52 Dynamic Analysis, *Technical advice to Energy Consumers Australia – Review of Energex's revised regulatory proposal*, January 2020, p. 5.

A.5 ICT

A.5.1 Final decision

We accept Energex's revised ICT capex forecast of $147.7 million. Its revised forecast is 2 per cent higher than our draft decision of $144.8 million, and 23 per cent lower than its initial proposal of $192.5 million.

Energex accepted our draft decision on ICT capex subject to a minor modelling adjustment to our substitute for recurrent ICT capex. We accept Energex's proposed adjustment and therefore consider Energex's revised ICT capex to be prudent and efficient.

A.6 Property

A.6.1 Final decision

We are satisfied that Energex's forecast non-network property capex of $76.0 million forms part of a total capex forecast that reasonably reflects the capex criteria. In coming to his position we focussed on the incremental differences between our draft decision and Energex's revised proposal.

Energex has demonstrated the prudency and efficiency of the proposed Rockhampton data centre replacement, but has not demonstrated the prudency and efficiency of its proposed redevelopment of its Rocklea training facility. Our analysis demonstrates that for the Rocklea training facility, Energex's base case is the most prudent and efficient option for the forthcoming regulatory control period. However, we do not consider this issue to be significant in the context of its overall capex forecast.

A.6.2 Energex's proposal

Energex's revised proposal includes forecast non-network property capex of $76.0 million. This is a reduction of $4.1 million from Energex's initial proposal of $80.1 million and an increase of $18.2 million from our draft decision of $57.8 million.

A.6.3 Reasons for final decision

Our draft decision considered the majority of the forecast as prudent and efficient, with the exception of four projects. Energex has accepted our position on two of these four projects, and has reproposed the other two projects. In response to our draft decision, Energex provided revised business cases and cost-benefit analyses for its proposed Rocklea training facility redevelopment and Rockhampton data centre replacement for us to consider.

Rocklea training facilities redevelopment

Energex proposed to redevelop its Rocklea training facility. Energex states that the drivers of this project are:[53]

- the aged and poor condition of buildings at the facility, leading to higher operational costs and safety concerns
- the effectiveness of the site for training operations (fitness-for-purpose)

While Energex provided some description of the issues at the sites, it has not presented a complete assessment to ascertain the scale and severity of these issues. For example, Energex has not defined or explained the criteria for how it assesses a building as "end-of-life", nor has it presented any evidence to support this conclusion. Similarly, it provides no details regarding past operational costs against efficient costs, nor does it give information about how many training hours were disrupted due to facility condition defects. We therefore remain of the view that Energex has not evidenced that there are material issues that it must address at this site such that it must redevelop the facility.

Energex's cost-benefit model estimates that the major redevelopment option will result in lower costs than the base case in NPV terms. Energex states that its counterfactual is to "maintain [the] current site configuration and layout with no material redevelopment".[54] However, in the cost-benefit model the base case includes the costs of the proposed major refurbishment in the following regulatory control period rather than not undertaking any major work at all. Energex provided no evidence to support this assumption. This assumption also differs to the documentation presented for the initial proposal, which assumed it would defer major works in perpetuity under a base case counterfactual.[55] The base case is therefore a deferral option, rather than the 'business-as-usual' counterfactual it has previously described.

We tested whether Energex's proposed major refurbishment was likely to be the lowest cost option by constructing the following two alternate options and calculating their NPV:

- Energex's base case with the assumed major refurbishment costs removed (i.e. a 'business-as-usual' counterfactual).[56]
- Energex's base case with the assumed major refurbishment deferred by an additional three years (i.e. an extended deferral option).

We found both of these options to have a higher NPV than Energex's preferred option.

---

53 Energex, *Revised Regulatory Proposal Attachment 6.020 – Business Case Rocklea Training Facility*, December 2019, pp. 7–9

54 Energex, *Revised Regulatory Proposal Attachment 6.020 – Business Case Rocklea Training Facility*, December 2019, p. 15

55 Energex, *Response to AER Information Request 003 – Property Townsville Training NPV*, 18 February 2019

56 We also allowed for the same forecast capex for defect remediation and lifecycle replacement every ten years from the cost-benefit model.

Energex has quantified two benefits from redeveloping the site:

- $477 000 per year for operational efficiencies
- $80 000 per year in opex savings.

Energex stated that the efficiency benefits are due to forecast time savings of 12 minutes per half-day of training delivered. However, we consider that participants cannot use this time savings for productive work, as they are away from their normal work locations. Similarly, because the lengths of the training courses are generally half a day at a minimum, the training time reduction would not create material savings for the training facilities. This is because it does not reduce the cost of the training or result in the delivery of additional training.

In conclusion, while Energex has made improvements in assessing this project, the information presented does not support the proposed works as being prudent and efficient for the forthcoming regulatory control period.

Rockhampton data centre replacement

Energex proposed to replace its Rockhampton data centre, a joint operational facility with Ergon Energy, at an alternative existing owned site enabling cost efficiencies through property rationalisation.

Similar to the Rocklea training facilities business case, the base case is a deferral option rather than a business-as-usual counterfactual. Energex provided no supporting evidence to explain this decision. Despite this, we found that when we removed the major works from the base case, the proposed option remained materially preferable in NPV terms.

Overall, the assumptions made in the cost-benefit model are reasonable and the business case demonstrates that the proposed investment in prudent.

A.7 Other non-network capex

A.7.1 Final decision

We accept Energex's revised fleet forecast of $107.8 million, based on the additional information it provided in its new fleet model.

A.7.2 Energex's proposal

Energex's revised proposal included forecast other non-network capex of $107.8 million. This is a reduction of $2.4 million from Energex's initial proposal of $110.2 million and an increase of $21.8 million from our draft decision of $86.0 million.

A.7.3 Reasons for final decision

In our draft decision we were not satisfied that Energex's initial proposal of $110.2 million for fleet, tools and equipment was prudent and efficient. We assessed the efficient service lives, unit rates and private use of vehicles resulting in a substitute

estimate of $86.0 million for fleet capex. Energex accepted that adjustments were necessary in each of these areas in its revised proposal.

The most significant differences between Energex's revised model and our approach we used for our substitute estimate include:

- reversing a top-down volume reduction that Energex had included in its original proposal and that our substitute had retained
- revised unit rates, using a combination of historical unit rates and estimates
    - Our substitute was based solely on historical averages
- Energex's assumption that cranes borers will require re-trucking after 10 years, where our substitute had assumed this was not necessary. [57]

Based on the information Energex has provided in its new bottom-up model, we are satisfied that its forecast reasonably reflects efficient fleet costs. In particular, Energex has provided further detailed information in support of its assumed unit costs, and we are satisfied that the costs of servicing crane borer truck bodies after 10 years are sufficiently close to replacement costs that the issue does not affect the forecast materially.

Stakeholders considered that given Energex's substantial work providing new information there is sufficient evidence to support the fleet program.[58]

A.8 Capitalised overheads

Overhead costs include business support costs not directly incurred in producing output, and shared costs that the business cannot directly allocate to a particular business activity or cost centre. The Australian Accounting Standards and the distributor's cost allocation method (CAM) determine the allocation of overheads.

A.8.1 Final decision

We accept Energex's forecast overheads of $557.7 million included in its revised proposal. We accept Energex's overheads forecasting methodology and as we have accepted Energex's direct capex forecast we have not made any further adjustments to its overheads forecast.

A.8.2 Energex's proposal

Energex forecast $557.7 million for capitalised overheads is higher than our draft decision forecast of $535.2 million. Energex accepted our draft decision methodology and applied the following adjustments:

---

[57] Energex, *Fleet, Tools and Equipment Capex Summary*, December 2019, pp.2–3.

[58] Dynamic Analysis, *Technical Advice to Energy Consumers Australia on Energex's Revised Proposal*, January 2020, pp. 9–10.

- updated its 2018–19 estimated capitalised overheads to actual costs
- applied its 2020–25 CAM to derive 2018–19 base year capitalised overheads
- calculated the historical proportion of capitalised overheads to total capex
- adjusted its forecast capitalised overheads from the draft decision to reflect the higher direct capex, assuming a 25 per cent variable component of capitalised overheads.[59]

A.8.3 Reasons for final decision

We had regard to AGL's submission that queried Energex's capitalised overheads forecast, as it is higher than its initial proposal forecast of $523.5 million.[60] We have reviewed Energex revised capitalised overheads forecast and we are satisfied with its proposed methodology. As noted in our draft decision we have undertaken a holistic approach to assessing Energex's capitalised overheads.

Although Energex's capitalised overheads are higher than its initial proposal, we are satisfied that its forecast is lower than its historical capitalised overheads on a like-for-like basis.

We also note that another driver of Energex's increased capitalised overheads, relative to our draft decision, is due to a higher capex forecast. As we have accepted Energex's revised proposal capex forecast we have not made any further adjustment to capitalised overheads. We note that, had we not adjusted for the reduction in capex in our draft decision, Energex's capitalised overheads would have been $561.1 million.[61]

---

[59] This approach is consistent with the methodology we have used to set a substitute estimate of capitalised overheads in our recent decisions.

[60] AGL, *Energex electricity distribution network – 2020 to 2025 draft decision*, 15 January 2020, p. 2.

[61] AER, *Attachment 5: Capital expenditure – Draft decision – Energex 2020–25*, October 2019, p. 72.

Shortened forms

Shortened form	Extended form
AER	Australian Energy Regulator
augex	augmentation expenditure
CAM	cost allocation method
capex	capital expenditure
CCP14	Consumer Challenge Panel, sub-panel 14
CPI	consumer price index
distributor	distribution network service provider
ECA	Energy Consumers Australia
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
opex	operating expenditure
repex	replacement expenditure
STPIS	service target performance incentive scheme