



DRAFT DECISION
Endeavour Energy
Distribution determination

2019–24

Attachment 6 – Operating
expenditure

November 2018

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Note

This attachment forms part of the AER's draft decision on the distribution determination that will apply to Endeavour Energy for the 2019–24 regulatory control period. It should be read with all other parts of the draft decision.

The draft 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 11 – Demand management incentive scheme

Attachment 12 – Classification of services

Attachment 13 – Control mechanism

Attachment 14 – Pass through events

Attachment 15 – Alternative control services

Attachment 16 – Negotiated services framework and criteria

Attachment 17 – Connection policy

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Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
CCP/CCP10	Consumer Challenge Panel, sub-panel 10
distributor	distribution network service provider
DMIA/DMIAM	demand management innovation allowance mechanism
EBSS	efficiency benefit sharing scheme
ECA	Energy Consumers Australia
EUAA	Energy Users Association of Australia
Guideline	Expenditure Forecast Assessment Guideline for Electricity Distribution
GSL	Guaranteed service level
LSECD	Cobb Douglas least squares estimation
LSETLG	Translog least squares estimation
MPFP	multilateral partial factor productivity
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
opex	operating expenditure
opex	operating expenditure
PIAC	Public Interest Advocacy Centre
RIN	regulatory information notice
SFACD	Cobb Douglas stochastic frontier analysis
WPI	Wage price index

6 Operating expenditure

Operating expenditure (opex) is the operating, maintenance and other non-capital expenses incurred in the provision of network services. Forecast opex for standard control services is one of the building blocks we use to determine a service provider's annual total revenue requirement.¹

This attachment outlines our assessment of Endeavour Energy's (Endeavour) forecast opex for the 2019–24 regulatory control period.

6.1 Draft decision

Our draft decision is to include a substitute estimate of total forecast opex of \$1,468.5 million (\$2018–19) in Endeavour's revenue for the 2019–24 regulatory control period.² We do not accept the total forecast opex in Endeavour's proposal. Our estimate is \$35.5 million (\$2018–19) or 2.4 per cent lower than Endeavour's proposal of \$1,504.0 million (\$2018–19).³

Our estimate is a decrease of 2.5 per cent from Endeavour's actual opex in the current regulatory control period.⁴ We consider this forecast reasonable reflects the opex criteria and:

- reflects the significant opex efficiency gains Endeavour forecasts to make in the current regulatory control period, and maintains these over the 2019–24 regulatory control period
- makes allowance for expected increases in input costs (including the cost of labour), and in the costs of operating a larger network with more customers.

We used our standard 'base-step-trend' approach to develop our alternative estimate.⁵ The opex forecast we have adopted in this draft decision starts with Endeavour's estimated costs in 2017–18 as a base year. We have then forecast growth in prices, output and productivity using our standard approach (with some refinement).⁶

The difference between Endeavour's proposed forecast opex and our estimate is primarily because our forecast of the expected increase in real labour prices in NSW (labour price growth) is lower than that proposed by Endeavour. We have applied our standard approach of averaging forecast growth in the NSW utilities wage price index from our consultant, Deloitte Access Economics, and Endeavour's consultant, BIS

¹ NER, cl.6.4.3(a)(7).

² NER, cl.6.12.1(4)(ii); Includes debt-raising costs.

³ Includes debt-raising costs.

⁴ The 3.6 per cent calculation excludes debt-raising costs.

⁵ AER, Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013.

⁶ Endeavour Energy did not propose any step changes and consistent with this we have not included any step changes in our alternative estimate.

Oxford Economics. In contrast, Endeavour only applied BIS Oxford Economics' forecasts.

We note that, for the purpose of this draft decision, our rate of change applies a zero productivity growth forecast. This is consistent with Endeavour's proposal, and has been our standard approach to forecasting the productivity component of our opex the rate of change in past decisions.

The AER's Consumer Challenge Panel 10 (CCP 10) submitted that a zero per cent productivity growth rate is not in the best interests of customers and that there is evidence to support the use of a positive productivity growth forecast. CCP10 states that:⁷

... the AER ... consider whether, particularly given the current performance of the NSW businesses, Ausgrid and Endeavour Energy's assumptions of zero trend productivity improvement are in the best interests of consumers. We consider that consumers should expect ongoing improvements in productivity and that this is consistent with the pressures on businesses in competitive markets to continuously search for productivity improvements.

We are currently reviewing our approach to forecasting productivity. This review may change our approach going forward. As part of this review we will consult with all distributors and any other interested stakeholders. We will take the outcome of this review into consideration in our final decision.

We have substituted our alternative estimate as the forecast opex in Endeavour's revenue determination for the 2019–24 regulatory control period. The reasons for our draft decision are set out in further detail in section 6.4.

Endeavour's forecast opex and our draft decision are set out in Table 6.1.

Table 6.1 Endeavour Energy's proposed opex and our draft decision (\$ million, 2018–19)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
Endeavour Energy's proposed opex	282.4	290.3	300.4	310.6	320.3	1504.0
AER draft decision	280.6	286.0	293.2	300.7	308.1	1468.5
Difference	-1.8	-4.4	-7.2	-9.9	-12.2	-35.5

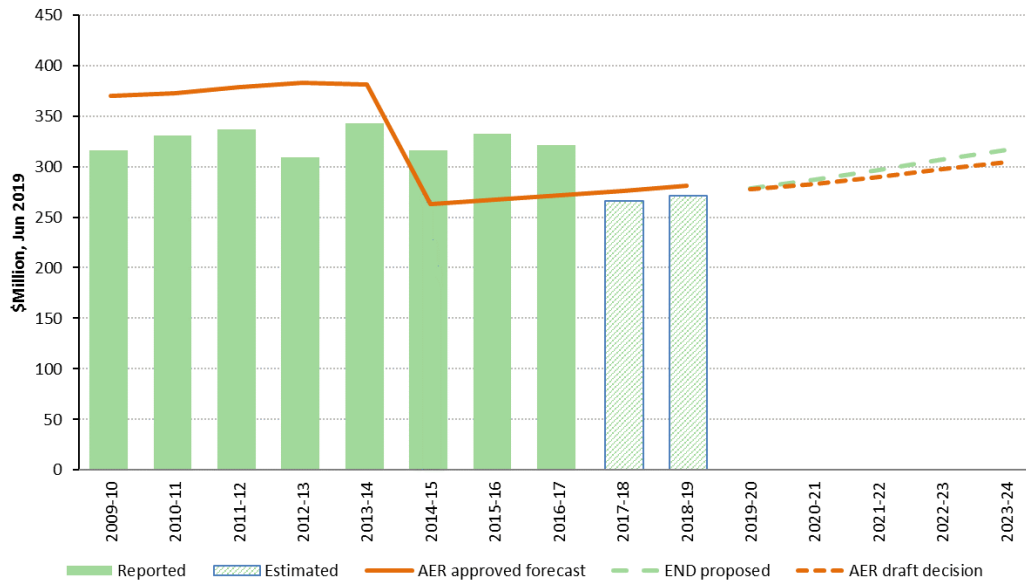
Source: Endeavour Energy, *Revenue proposal, Post tax revenue model (PTRM)*, April 2018; AER analysis

Note: Includes debt-raising costs. Numbers may not add up to total due to rounding.

⁷ Consumer Challenge Panel (Subpanel 10), *CCP10 Response to AER Issues paper and revenue Proposals for NSW Electricity Distribution Businesses 2019-24*, August 2018, pp.30-31.

Figure 6.1 shows Endeavour's opex forecast, its actual opex, our previous regulatory decisions and our draft decision forecast.

Figure 6.1 Actual and forecast opex (\$ million, 2018–19)



Source: AER analysis; Endeavour Energy - 0.04 Post tax revenue model, April 2018.

Note: Excludes debt raising costs. The reported opex and the AER approved forecast in the 2009–14 regulatory control period corresponds to the service classification and cost allocation methodology in place at the time.

6.2 Endeavour Energy proposal

Endeavour's forecast opex of \$1,504.0 million (\$2018–19) is a decrease of 0.2 per cent from its actual and estimated opex for the 2014–19 regulatory control period.

Table 6.2 sets out Endeavour's proposed opex for each year of the 2019–24 regulatory control period.

Table 6.2 Endeavour Energy's proposed opex (\$ million, 2018–19)

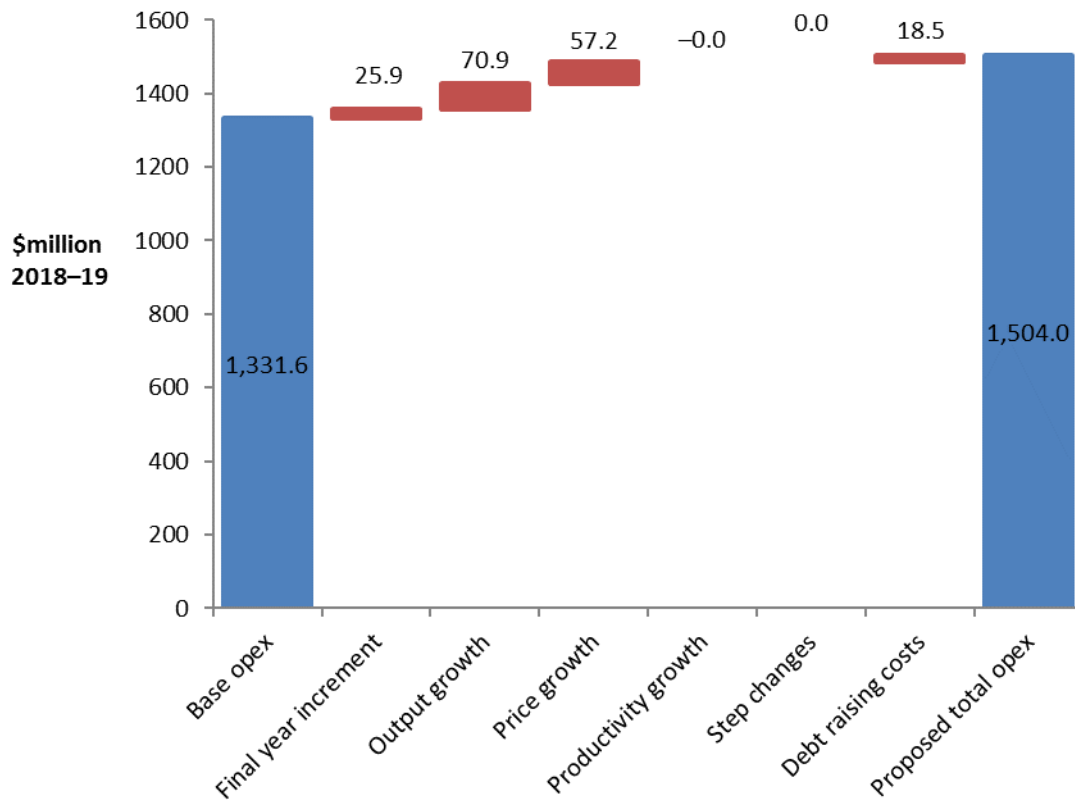
	2019–20	2020–21	2021–22	2022–23	2023–24	Total
Opex excluding debt raising costs	278.8	286.7	296.7	306.8	316.5	1,485.5
Debt raising costs	3.5	3.6	3.7	3.8	3.9	18.5
Total opex	282.4	290.3	300.4	310.6	320.3	1,504.0

Source: Endeavour Energy regulatory proposal

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

Figure 6.2 provides a breakdown of Endeavour's opex forecast into key components.

Figure 6.2 Endeavour Energy's opex forecast breakdown



Source: AER analysis.

Endeavour has adopted our revealed cost approach to forecasting opex (the 'base-step-trend' approach).⁸ The key elements of Endeavour's proposal are:

- Endeavour used its estimated opex in 2017–18 (its base year) to derive a base opex of \$1331.6 million (\$2018–19).⁹
- Endeavour applied the final year formula in our *Expenditure forecast assessment guideline* (the Guideline) to derive a final year increment of \$25.9 million (\$2018–19).
- Endeavour then trended forward its base opex to account for:
 - Expected increases in real input prices, including forecast increases in labour costs and an increase in line with CPI for non-labour costs (\$57.2 million, \$2018–19).¹⁰

⁸ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, pp. 166-177.

⁹ The actual opex for the 2014–19 regulatory control period in Endeavour Energy's proposal includes its estimates of opex for 2017–18 and 2018–19. The 2017–18 estimate will be updated in the revised regulatory proposal when actual data becomes available.

¹⁰ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, pp. 171-172.

- Forecast output growth, driven primarily by increased customer numbers, circuit line length and maximum demand, all of which can increase the cost to Endeavour of operating its network (\$70.9 million, \$2018–19).¹¹
- Forecast zero change in opex productivity over the regulatory period.¹²
- Endeavour forecast \$18.5 million (\$2018–19) of debt raising costs. Debt raising costs are transaction costs incurred each time debt is raised or refinanced.¹³

6.2.1 Submissions on Endeavour Energy's proposal

We received six submissions on Endeavour's opex proposal. These were from AGL Energy, CCP10, Energy Consumers Australia (ECA), Energy Users Association of Australia (EUAA), Origin Energy and the Public Interest Advocacy Centre (PIAC). Broadly, the submissions considered that firms in competitive markets, such as Endeavour, should expect positive productivity improvements.¹⁴

Where relevant, we refer to submissions that relate to specific components of Endeavour's opex forecast in section 6.4, where we explain the reasoning for our draft decision.

6.3 Assessment approach

Our role is to form a view about whether a business's forecast of total opex is reasonable. Specifically, we must form a view about whether a business's forecast of total opex 'reasonably reflects the opex criteria'.¹⁵ In doing so, we must have regard to each of the opex factors specified in the NER.¹⁶

If we are satisfied the business's forecast reasonably reflects the criteria, we must accept the forecast.¹⁷ If we are not satisfied, we are required to substitute an alternative estimate that we are satisfied reasonably reflects the opex criteria for the business's forecast taking into account the opex factors.¹⁸ In making this decision, we take into account the reasons for the difference between our alternative estimate and the business's proposal, and the materiality of the difference. Further, we consider interrelationships with the other building block components of our decision.¹⁹

¹¹ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, pp. 173.

¹² Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, pp. 174-176.

¹³ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.182.

¹⁴ AGL - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 September 2018, p.4; CCP10 - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 8 August 2019, pp.30–31; ECA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 August 2018, p.13; EUAA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 10 August 2018, p.11; Origin - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 8 August 2018.

¹⁵ NER, cl. 6.5.6(c).

¹⁶ NER, cl. 6.5.6(e).

¹⁷ NER, cl. 6.5.6(c).

¹⁸ NER, cll. 6.5.6(d) and 6.12.1(4)(ii). The opex factors are outlined at cl.6.5.6(e).

¹⁹ NEL, s. 16(1)(c).

The *Expenditure forecast assessment guideline* (the Guideline) together with an explanatory statement set out our intended approach to assessing opex in accordance with the NER.²⁰ We published the Guideline and the associated explanatory statement in November 2013 following an extensive consultation process with service providers, network users, and other stakeholders. While the Guideline provides for greater regulatory predictability, transparency and consistency, it is not mandatory. However, if we make a decision that is not in accordance with the Guideline, we must state the reasons for departing from the Guideline.²¹

Below we further explain the principles that underpin this approach and provide a high-level overview of the 'base–step–trend' methodology.

6.3.1 Incentive regulation and the 'top-down' approach

Incentive regulation is designed to prevent network businesses from exploiting their natural monopoly position by setting prices in excess of efficient costs.²² A key feature of the regulatory framework is that it is based on incentivising networks to be as efficient as possible. We apply incentive-based regulation across the energy networks we regulate, including electricity distribution networks. More specifically for opex, we rely on the efficiency incentives created by both ex ante revenue regulation (where an opex allowance is granted over a multi-year regulatory period) and the 'efficiency benefit sharing scheme' (EBSS).

The incentive-based regulatory framework partially overcomes the information asymmetries between the regulated businesses and us, the regulator.²³

Incentive regulation encourages regulated businesses to reduce costs below the regulator's forecast, in order to make higher profits, and 'reveal' their costs in doing so. The information revealed by the businesses allows us to develop better expenditure forecasts over time. Revealed opex reflects the efficiency gains made by a business over time. As a network business becomes more efficient, this translates to lower forecasts of opex in future regulatory periods, which means consumers also receive the benefits of the efficiency gains made by the business. Incentive regulation therefore aligns the business's commercial interests with consumer interests.

Our general approach is to assess the business's forecast opex over the regulatory control period at a total level, rather than to assess individual opex projects or programs. To do so, we develop an alternative estimate of total opex using a 'top-down' forecasting method, known as the 'base–step–trend' approach (section 6.3.2).²⁴

²⁰ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013; AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013.

²¹ NER, cl. 6.2.8(c)(1).

²² Productivity Commission, *Electricity Network Regulatory Frameworks, volume 1, No. 62*, 9 April 2013, p. 188.

²³ Productivity Commission, *Electricity Network Regulatory Frameworks, volume 1, No. 62*, 9 April 2013, p. 189.

²⁴ A 'top-down' approach forecasts total opex at an aggregate level, rather than forecasting individual projects or categories to build a total opex forecast from the 'bottom up'.

Benchmarking a network business against others in the National Electricity Market (NEM) provides an indication of whether revealed opex can be adopted as 'base opex' and, if not, what our alternative estimate of base opex should be. While benchmarking is a key tool, we will use a combination of techniques to assess whether base opex reasonably reflects the opex criteria.²⁵ We may make a negative adjustment to the business's revealed opex if we consider it is operating in a materially inefficient manner. Material inefficiency is a concept we introduce in our Guideline.²⁶ We consider a service provider is materially inefficient when it is not at or close to its peers on the efficiency frontier. We define this more precisely in the context of economic benchmarking below.

Incentive regulation is designed to leave the day-to-day decisions to the network businesses.²⁷ It allows the network businesses the flexibility to manage their assets and labour as they see fit to achieve the opex objectives in the NER,²⁸ and more broadly, the National Electricity Objective (NEO).²⁹ This is consistent with the requirement that we consider whether *the total* opex forecast, and *not* the individual forecast opex components, reasonably reflects the opex criteria.³⁰

The Australian Energy Market Commission (AEMC) supports this view of our role as the economic regulator. It stated:³¹

The key feature of economic regulation of [distribution network service providers] in the NEM is that it is based on incentives rather than prescription...

Importantly, under [incentive-based regulation], funding is not approved for [distribution network service providers'] specific projects or programs. Rather, a total revenue requirement is set, which is based on forecasts of total efficient expenditure. Once a total revenue is set, it is for the [business] to decide which suite of projects and programs are required to deliver services to consumers while meeting its regulatory obligations...

6.3.2 Base–step–trend forecasting approach

As a comparison tool to assess a business's opex forecast, we develop an alternative estimate of the business's total opex requirements in the forecast regulatory control period, using the base–step–trend forecasting approach. We also have regard to the opex factors set out in the NER.³²

²⁵ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p 32.

²⁶ AER, *Expenditure Forecast Assessment Guideline*, November 2013, p. 22.

²⁷ Productivity Commission, *Electricity Network Regulatory Frameworks, volume 1, No. 62*, 9 April 2013, pp. 27–28.

²⁸ NER, cl. 6.5.6(a).

²⁹ NEL, s. 7.

³⁰ NER, cl. 6.5.6(c).

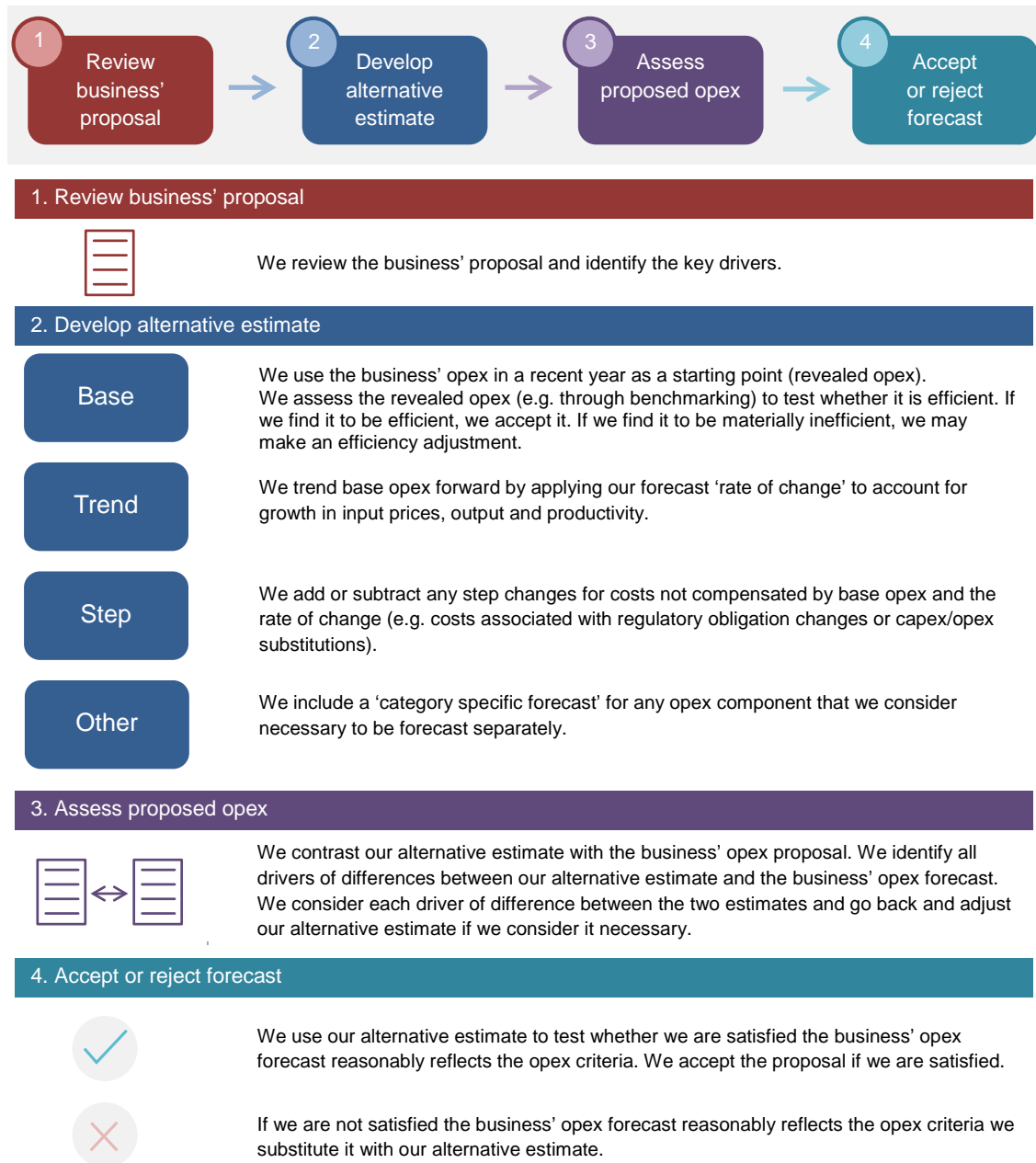
³¹ AEMC, *Contestability of energy services, Consultation paper*, 15 December 2016, p. 32.

³² NER, cl.6.5.6(e).

If the business adopts a different forecasting approach to derive its opex forecast, we develop an alternative estimate and assess any differences with the business's forecast opex.

Figure 6.3 summarises the base–step–trend forecasting approach.

Figure 6.3 Our opex assessment approach



Base opex

If we find the business is operating efficiently, our preferred methodology is to use the business's actual or 'revealed' costs in a recent year as a starting point for our opex forecast.³³

We do not simply assume the business's revealed opex is efficient. It may include an ongoing level of inefficient expenditure. We use our benchmarking results³⁴ and other assessment techniques to test whether the business is operating efficiently.

We consider revealed opex in the base year is generally a good indicator of opex requirements over the next regulatory period because the level of *total opex* is relatively stable from year to year. This reflects the broadly predictable and recurrent nature of opex.

A business may experience fluctuations in particular categories of opex, and the composition of total opex can change, from year to year. While many operation and maintenance activities are recurrent and non-volatile, some opex projects follow periodic cycles that may or may not occur in any given year, and some opex projects are non-recurrent.

Even if disaggregated opex categories have high volatility, the total opex varies to a lesser extent because new or increasing components of opex are generally offset by decreasing costs or discontinued opex projects. Further, we expect the regulated business to manage the inevitable 'ups and downs' in the components of opex from year to year—to the extent they do not offset each other—by continually re-prioritising its work program, as would be expected in a workably competitive market. Our incentive-based, revealed cost, framework incentivises them to do so.

Rate of change

We trend base opex forward by applying our forecast 'rate of change'. We estimate the rate of change by forecasting the expected growth in input prices, outputs and productivity. We consider that the rate of change takes into account almost all drivers of opex growth.

We forecast input price growth using a composition of labour and non-labour price changes forecasts. Labour costs represent a significant proportion of a distribution business's costs.³⁵ To determine the input price weights for labour and non-labour prices, we have regard to the input price weights of a prudent and efficient benchmark business. Consistent with incentive regulation, this provides the business an incentive to adopt the most efficient mix of inputs throughout the regulatory control period.

³³ NER, cl.6.5.6(e)(5).

³⁴ AER, *Annual benchmarking report—Electricity distribution network service providers*, November 2017.

³⁵ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, p. 49.

We forecast output growth to account for annual increase in output. The output measures used should be the same measures used to forecast productivity growth.³⁶ Productivity measures the change in output for a given amount of input. If the output measures differ from the productivity measures, they would be internally inconsistent and we cannot compare them like for like.

The output measures we typically use for distribution businesses are customer numbers, ratcheted maximum demand and circuit length. We do not typically adjust forecast output growth for economies of scale because we account for these in our forecast of productivity growth.

Our forecast of productivity growth represents our best estimate of the shift in the industry 'efficiency frontier'.³⁷ We generally base our estimate of productivity growth on recent productivity trends across the industry. However, if we consider historic productivity growth does not represent 'business-as-usual' conditions we do not use it to forecast future productivity growth.

Our standard approach to forecasting the productivity component of our opex the rate of change in past decisions has been to apply zero productivity growth. In its submission to our issues paper, the CCP10 submits that a zero per cent productivity growth rate is not in the best interests of customers and that there is evidence to support the use of a positive productivity growth forecast. CCP10 states that:³⁸

... the AER ... consider whether, particularly given the current performance of the NSW businesses, Ausgrid and Endeavour Energy's assumptions of zero trend productivity improvement are in the best interests of consumers. We consider that consumers should expect ongoing improvements in productivity and that this is consistent with the pressures on businesses in competitive markets to continuously search for productivity improvements.

We are currently reviewing our approach to forecasting productivity. This review may change our approach going forward. As part of this review we will consult with all distributors and any other interested stakeholders. We will take the outcome of this review into consideration in our final decision.

Step changes and category-specific forecasts

Lastly, we add or subtract any components of opex that are not adequately compensated for in base opex or the rate of change, but which should be included in the forecast total opex to meet the opex criteria.³⁹ These adjustments are in the form of 'step changes' or 'category-specific forecasts'.

³⁶ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 23.

³⁷ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 24.

³⁸ Consumer Challenge Panel (Subpanel 10), *CCP10 Response to AER Issues paper and revenue Proposals for NSW Electricity Distribution Businesses 2019-24*, August 2018, pps.30-31.

³⁹ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 24.

Step changes

Step changes should not double count costs included in other elements of the total opex forecast. As explained in the Guideline, the costs of increased volume or scale should be compensated for through the output growth component of the rate of change and it should not become a step change.⁴⁰ In addition, forecast productivity growth may account for the cost of increased regulatory obligations over time—that is, 'incremental changes in obligations are likely to be compensated through a lower productivity estimate that accounts for higher costs resulting from changed obligations.'⁴¹ Therefore, we consider only new costs that do not reflect the historic 'average' change as accounted for in the productivity growth forecast require step changes.⁴²

To increase its maximum allowable revenue, a regulated business has an incentive to identify new costs not reflected in base opex or costs increasing at a greater rate than the rate of change. It has no corresponding incentive to identify those costs that are decreasing or will not continue. Information asymmetries make it difficult for us to identify those future diminishing costs. Therefore, simply demonstrating that a new cost will be incurred—that is, a cost that was not incurred in the base year—is not a sufficient justification for introducing a step change. There is a risk that including such costs would upwardly bias the total opex forecast.

The test we apply is whether the step change is needed for the opex forecast to achieve the opex objectives in the NER.⁴³ Our starting position is that only exceptional circumstances would warrant the inclusion of a step change in the opex forecast because they may change a business's fundamental opex requirements.⁴⁴ Two typical examples are:

- a material change in the business's regulatory obligations
- an efficient and prudent capital expenditure (capex)/opex substitution opportunity.⁴⁵

We may accept a step change if a material 'step up' or 'step down' in expenditure is required by a network business to prudently and efficiently comply with a new, binding regulatory obligation that is not reflected in the productivity growth forecast.⁴⁶ This does not include instances where a business has identified a different approach to comply with its existing regulatory obligations that may be more onerous, or where there is increasing compliance risks or costs the business must incur to comply with its regulatory obligations. Usually when a new regulatory obligation is imposed on a business, it will incur additional expenditure to comply. The business may be expected

⁴⁰ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 24.

⁴¹ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, p. 52.

⁴² AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 24.

⁴³ NER, cl. 6.5.6(a).

⁴⁴ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 24.

⁴⁵ NER, cl.6.5.6(e)(7).

⁴⁶ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 11.

to continue incurring such costs associated with the new regulatory obligation into future regulatory periods; hence, an increase in its opex forecast may be warranted.

We expect the business to provide evidence demonstrating the material impact the change of regulatory obligation has on its opex requirements, and robust cost–benefit analysis to demonstrate the proposed step change expenditure is prudent and efficient to meet the change in regulatory obligations.⁴⁷ We stated in the explanatory statement accompanying the Guideline:⁴⁸

[Network services providers] will be expected to justify the cost of all step changes with clear economic analysis, including quantitative estimates of expected expenditure associated with viable options. We will also look for the [Network services providers] to justify the step change by reference to known cost drivers (for example, volumes of different types of works) if cost drivers are identifiable. If the obligation is not new, we would expect the costs of meeting that obligation to be included in revealed costs. We also consider it is efficient for [Network services providers] to take a prudent approach to managing risk against their level of compliance when they consider it appropriate (noting we will consider expected levels of compliance in determining efficient and prudent forecast expenditure).

By contrast, proposed opex projects designed to improve the operation of the business, which we consider as discretionary in the absence of any legal requirement, should be funded by base opex and trend components, together with any savings or increased revenue that they generate—rather than through a step change. Otherwise, the business would benefit from a higher opex forecast and the efficiency gains.⁴⁹

We may also accept a step change in circumstances where it is prudent and efficient for a network business to increase opex in order to reduce capital costs. We would typically expect such capex/opex trade-off step changes to be associated with replacement expenditure.⁵⁰ The business should provide robust cost–benefit analysis to clearly demonstrate how increased opex would be more than offset by capex savings.⁵¹

In the absence of a change to regulatory obligations or a legitimate capex/opex trade-off opportunity, we would accept a step change under limited circumstances. We would consider whether the costs associated with the step change are unavoidable and material—such that base opex, trended forward by the forecast rate of change, would be insufficient for the business to recover its efficient and prudent costs. We would also consider whether the business would continue to incur the costs of a proposed step change in future regulatory periods.

⁴⁷ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, pp. 51–52; AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 11.

⁴⁸ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, p. 52.

⁴⁹ AER, *Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 11.

⁵⁰ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, p. 74.

⁵¹ AER, *Expenditure forecast assessment guideline, Explanatory statement*, November 2013, p. 52.

Category specific forecasts

A category specific forecast may be justified if, as a result of including a specific opex category in the base opex, total opex becomes so volatile that it undermines our assumption that total opex is relatively stable and follows a predictable path over time.

We may also use category specific forecasts to avoid inconsistency or double counting within our determination. We have typically included category specific forecasts for debt raising costs, the demand management incentive allowance (DMIA) and guaranteed service levels (GSL) payments. There are specific reasons for forecasting these categories separately from base opex. For example, we forecast debt raising costs separately to provide consistency with the forecast of the cost of debt in the rate of return building block of allowable revenue. For DMIA, we forecast these costs separately because we fund them through a separate building block.

Absent such exceptions, we expect that base opex, trended forward by the rate of change, will allow the business to recover its prudent and efficient costs. Again, the business has demonstrated its ability to operate prudently and efficiently at that level of opex while meeting its existing regulatory obligations, including its safety and reliability standards. We consider it is reasonable to expect the same outcome looking forward. Some costs may go up, and some costs may go down—so despite potential volatility in the cost of certain individual opex activities, total opex is generally relatively stable over time. As we stated above in relation to step changes, a business has an incentive to inflate its total opex forecast by identifying new and increasing costs, but not declining costs. Consequently, there is a risk that providing a category specific forecast for opex items identified by the business may upwardly bias the total opex forecast. By applying our revealed cost approach consistently and carefully scrutinising any further adjustments, we avoid this potential bias.

6.3.3 Interrelationships

In assessing Endeavour Energy's total forecast opex we took into account other components of its revenue proposal, including:

- the impact of cost drivers that affect both forecast opex and forecast capex. For instance, forecast labour price growth affects forecast capex and our forecast of forecast price growth used to estimate the rate of change in opex
- the approach to assessing the rate of return, to ensure there is consistency between our determination of debt raising costs and the rate of return building block
- concerns of electricity consumers identified in the course of Endeavour's engagement with consumers.⁵²

⁵² NER, cl. 6.5.6(e)(5A).

6.4 Reasons for draft decision

Our draft decision is to include a substitute total forecast opex of \$1,468.5 million (\$2018–19) in Endeavour's revenue for the 2019–24 regulatory control period.⁵³ We consider that this forecast reasonably reflects the opex criteria.

Our total forecast is \$35.5 million (\$2018-19) or 2.4 per cent lower than Endeavour's proposal of \$1,504.0 million (\$2018-19). This is primarily because our forecast of expected increases in real labour prices in NSW (labour price growth) is lower than proposed by Endeavour.

We do not accept that Endeavour's proposed forecast reasonably reflects the opex criteria. We have adopted our alternative estimate as the forecast opex in Endeavour's revenue determination for the 2019–24 regulatory control period.

Table 6.3 compares the differences between our alternative estimate and Endeavour's opex proposal, noting as above the main difference is the price growth forecast.

Table 6.3 Our alternative estimate compared to Endeavour Energy's proposal (\$ million, 2018–19)

	Endeavour	Our alternative estimate	Difference
Base opex	1331.6	1,333.6	2.0
2017–18 to 2018–19 increment	25.9	25.9	0.0
Price growth	57.2	20.8	-36.3
Output growth	70.9	71.7	0.8
Productivity growth	–	–	–
Debt raising costs	18.5	16.6	-1.9
Total opex	1504.0	1468.5	-35.5

Source: Endeavour Energy, 11,01 Opex model, April 2018; AER analysis.

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

We discuss the components of our alternative estimate below. Full details of our alternative estimate are set out in our opex model, which is available on our website.

⁵³ NER, cl.6.12.1(4)(ii); Includes debt-raising costs.

6.4.1 Base opex

This section provides our view on the prudent and efficient level of base opex that Endeavour would need for the safe and reliable provision of electricity services over the 2019–24 regulatory control period.

Endeavour proposes to use its estimated opex for 2017–18 as the base to forecast opex over the 2019–24 regulatory control period. It estimates that this opex will be \$258.8 million (\$ nominal). We have assessed the efficiency of Endeavour's base year opex using multiple techniques and information sources, including its revealed opex over the 2014–19 regulatory control period, a review of its expenditure cost categories and economic benchmarking analysis.

As outlined in the Guideline, our preferred approach for forecasting opex is to use a revealed cost approach.⁵⁴ This is because opex is largely recurrent and stable at a total level between regulatory periods. Where a distributor is responsive to the financial incentives under the regulatory framework, the actual level of opex it incurs should provide a good estimate of the efficient costs required for it to operate a safe and reliable network and meet its relevant regulatory obligations.

Given the strong incentives Endeavour has faced in the current period to reduce costs, we have used a revealed costs approach to assess the efficiency of Endeavour's base year.⁵⁵ The cost data shows that Endeavour's opex has been decreasing since 2015–16 and its opex forecast for 2017–18 is consistent with our 2015 final decision estimate of efficient opex. This decrease in opex over the current period is driven by costs savings from a restructuring program that has seen Endeavour decrease its workforce by around 750 full-time equivalent staff (FTEs) from 2012–13 up to 2016–17. Endeavour is proposing to sustain these cost savings into the future by adopting its 2017–18 target opex as the base year for its 2019–24 revenue proposal.⁵⁶

Endeavour appears to have responded to the incentives imposed by our regulatory regime over the 2014–19 regulatory control period. Our revealed costs analysis supports the view that its proposed base year represents an efficient and sustainable level of opex that reasonably reflects the opex criteria.

To cross check this position we tested the efficiency of Endeavour's 2017–18 base year opex with two supplementary tools:

- Economic benchmarking of Endeavour's 2017–18 base year shows that it represents an improvement in opex productivity relative to the level Endeavour achieved in 2012–13, as well as a significant improvement compared to some

⁵⁴ AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p.31.

⁵⁵ Endeavour Energy has faced a strong incentive to reduce its costs over the 2014–19 regulatory control period given that our April 2015 opex decision was significantly below its actual costs at the start of the regulatory period.

⁵⁶ Endeavour Energy, *Proposal for the remittal of the Endeavour Energy 2014-19 Determination*, 5 April 2018, p. 3.

other electricity networks in 2015–16 as measured in our 2017 benchmarking report.⁵⁷ This indicates Endeavour's base year is not materially inefficient.

- Category level cost analysis shows that Endeavour has incurred increased costs early in the current period to fund improved compliance with existing vegetation management regulations and workforce redundancies. However, it has achieved significant cost savings in other opex categories (i.e. emergency services costs, maintenance costs and other overhead costs). This has allowed Endeavour to achieve opex efficiencies this regulatory control period that will allow it to continue to fund regulatory compliance while sustaining an efficient level of total opex in the next regulatory control period.

Taken together, this indicates that Endeavour's proposed 2017–18 base year opex provides a reasonable estimate of the prudent and efficient level of base opex it would need for the safe and reliable provision of electricity services. Therefore, we propose to rely on Endeavour's opex in 2017–18 as our base year for the purposes of forecasting opex over the 2019–24 regulatory control period.

In our final decision, we will update our opex forecast using Endeavour's actual reported opex in 2017–18.

Endeavour Energy's revealed costs over 2014–19

This section examines Endeavour's revealed costs between 2012–13 (its proposed base year for its 2014–19 revenue proposal) and 2018–19 (the end of the current regulatory period).

In April 2015, we made a decision on Endeavour's opex forecast for the 2014–19 regulatory control period.⁵⁸ We found Endeavour's 2012–13 base year opex to not be materially inefficient and a reasonable basis for forecasting opex for the 2014–19 regulatory period. We relied on our economic benchmarking to inform our finding on the efficiency of Endeavour's base year. However, we found Endeavour's total opex proposal was materially inefficient primarily due to proposed step changes for complying with vegetation management standards and funding redundancy costs.⁵⁹ Consistent with the NER, we substituted a lower total opex forecast amount, which was 17 percent lower than the amount proposed by Endeavour.

Our April 2015 decision was overturned by the Australian Competition Tribunal, and we were required to remake our decision in accordance with the Tribunal's directions. On

⁵⁷ Economic Insights, *Assessment of Endeavour Energy's proposed base year opex*, 16 July 2018.

⁵⁸ AER, *Final Decision Endeavour Energy distribution determination 2015–16 to 2018–19*, April 2015.

⁵⁹ Endeavour Energy considered its 2012-13 base year did not reflect the full cost of complying with its existing vegetation management regulatory standards and proposed an increase in opex to improve compliance with these standards. We considered that there was not sufficient evidence for the vegetation management step change and that allowing it would result in a materially inefficient level of total opex. We substituted our alternative opex forecast based on Endeavour's proposed opex without the vegetation management step change and concluded that it was sufficient to meet all its existing regulatory obligations, including for vegetation management.

5 April 2018, Endeavour submitted a proposal for the remaking of our 2014–19 decision. Endeavour's proposal was consistent with the opex forecast we determined in our April 2015 decision, and our remade decision accepted this position in September 2018.⁶⁰

Endeavour has faced a strong incentive to reduce its costs over the 2014–19 regulatory control period given that our April 2015 opex forecast was significantly below its actual costs at the start of the regulatory period. Endeavour also faced uncertainty around its final revenue allowance and the outcome of the appeals process, prior to us remaking our opex decision for the 2014–19 regulatory control period in September 2018.

Figure 6.4, shows Endeavour's actual opex up to 2016–17 and its estimated opex for 2017–18 and 2018–19. Endeavour's actual opex in the first three years of the regulatory control period was greater than our April 2015 final decision opex forecast. Endeavour states that this increase in opex was driven primarily by:

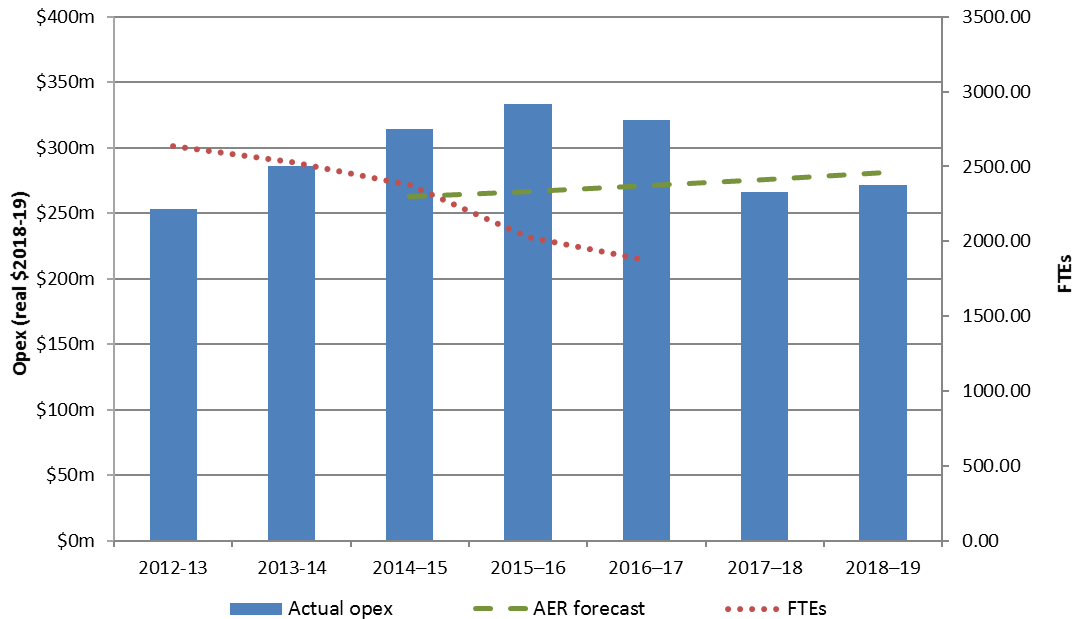
- an increase in vegetation management costs to achieve compliance with existing regulatory standards, and
- an increase in redundancy costs associated with the 'Endeavour 2020' efficiency transformation program that decreased Endeavour's workforce from 2,635 FTEs in 2012–13 to 1,878 FTEs by 2016–17 (Figure 6.4).⁶¹

In 2016–17, Endeavour's actual opex declined by 3.6 per cent; is forecast to decrease by a further 17.2 per cent in 2017–18; and then increase slightly (by 1.9 per cent) in 2018–19. Endeavour's estimated opex for 2017–18 and 2018–19 are consistent with our April 2015 opex forecast and our remade final decision for the 2014–19 regulatory control period.

⁶⁰ AER, *Endeavour Energy 2014–19 electricity distribution determination*, September 2018.

⁶¹ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.163 refers to Endeavour 2020 - an "organisation-wide efficiency transformation program for the 2014-19 period".

Figure 6.4 Endeavour Energy's opex, AER forecast opex in 2015 final decision, including movements in FTEs



Source: AER final decision; Annual RIN; Endeavour Energy response to AER information request; Annual reports.

Note: Actual opex has been normalised by excluding metering and ancillary costs prior to 2014-15. The costs associated with these services were classified as standard controls services over the 2009-14 regulatory control period, but were re-classified as alternative control services for the 2014-19 regulatory control period.

Endeavour states that the large forecast decrease in opex between 2016-17 and 2017-18 is in part driven by declining redundancy costs.⁶² Endeavour has also stated that since 2012, it had improved its efficiency under its 'Endeavour 2020' efficiency transformation program:⁶³

Since 2012, we have cut our workforce by almost 1,000 FTEs without compromising safety or reliability, and generated total savings of \$891m (real FY18) through to February 2018. Endeavour Energy continues to build on its history of focused reform and measurable, sustained efficiency improvements. Our final year opex in 2018/19 represents a reduction in our annual opex of 20 per cent in real 2018/19 dollar terms over the current regulatory period.⁶⁴

⁶² Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.164.

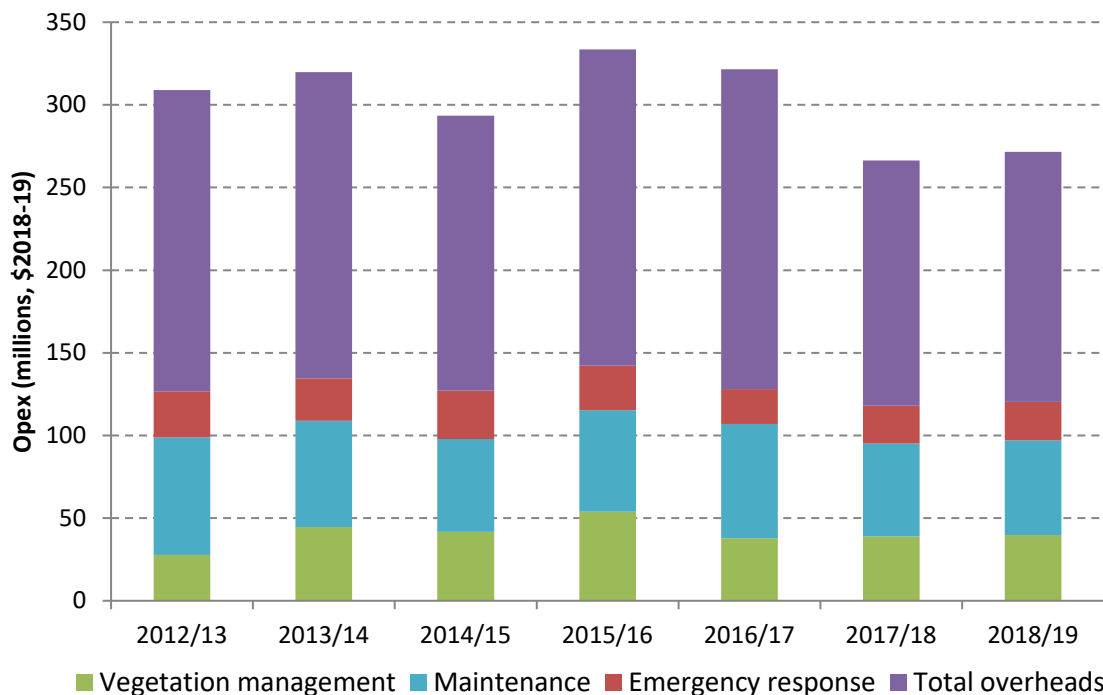
⁶³ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.163 notes that "Endeavour 2020 was an organisation-wide efficiency transformation program for the 2014-19 period". The program was implemented following the AER's 2014-19 determination and in advance of the partial 99-year lease of the business to private investors. Endeavour Energy conducted a review of its operations to identify cost improvement opportunities in order to reduce the shareholder-funded opex to the lowest amount possible.

⁶⁴ Endeavour Energy, *Proposal for the remittal of the Endeavour Energy 2014-19 Determination*, 5 April 2018, p. 2.

The Endeavour 2020 efficiency program has led to reductions across Endeavour's major cost categories. Figure 6.5 shows the breakdown of Endeavour's major opex cost categories using actual data up to 2016–17 and estimated data for 2017–18 and 2018–19. Between 2012–13 and 2017–18:

- emergency services costs reduced by 15.2 per cent
- maintenance costs reduced by 18.2 per cent
- total overheads reduced by 15.9 per cent.⁶⁵

Figure 6.5 Endeavour Energy's opex cost breakdown, \$2018–19



Source: Endeavour Energy Category Analysis RIN; Reset RIN; AER analysis.

Note: This chart has not been adjusted for changes in service classification costs prior to 2014–15. This means that total opex in 2012-13 and 2014-15 appears higher in Figure 6.5 compared to Figure 6.4.

Over the same period, vegetation management costs are forecast to increase by 44.7 per cent. The observed increase in vegetation management costs over the 2014–19 regulatory control period has been driven by Endeavour's actions to improve compliance with its existing regulatory standards.

In 2015, Endeavour proposed 2012–13 as its base year for forecasting opex for the 2014–19 regulatory control period, while noting that opex in this year did not reflect the full cost of complying with its existing regulatory obligations, in particular those relating

⁶⁵ These reductions may in part reflect changes in service classification costs between the 2009-14 and 2014-19 regulatory control periods.

to vegetation management.⁶⁶ It stated that it faced increases in vegetation management costs over the 2014–19 regulatory period to improve compliance with standards and proposed a step-change to cover the higher costs.⁶⁷

In our 2015 final decision, we found there was insufficient evidence that Endeavour required an increase in opex to meet its existing regulatory obligations and determined that its 2012–13 base opex was sufficient for it to meet its existing obligations.⁶⁸

In its proposal for the 2019–24 regulatory control period, Endeavour notes that it has reduced its opex over the 2014–19 regulatory control period despite facing additional cost pressures, including from the need to increase vegetation management costs by more than \$10.0 million annually to ensure compliance with the required safety standards.⁶⁹

Endeavour also notes that it has been able to meet these increased costs and achieve compliance with its vegetation management requirements while reducing its overall opex to the same level as the AER's final year opex allowance for the 2014–19 regulatory control period.⁷⁰

Figure 6.5 also shows higher levels of total overheads in 2015–16 and 2016–17 driven by an increase in redundancy costs. Total overheads and redundancy costs decreased in 2017–18 and are forecast to be maintained at this level in the last year of the regulatory period.

In our April 2015 decision, we found that, while Endeavour had begun efficiency improvements, it had higher than efficient labour costs because it had too many staff and had engaged permanent staff in preference to contractors over the 2009–14 regulatory control period.⁷¹ These staff became 'stranded labour' (workers identified as surplus to operational requirements but who could not be made redundant) because of restrictions on involuntary redundancies imposed by Endeavour's enterprise bargaining agreement.⁷² These views were informed by a review conducted by Deloitte Access Economics.⁷³

⁶⁶ Endeavour Energy, *Revised Regulatory Proposal – 1 July 2015 to 30 June 2019*, pp. 78-79.

⁶⁷ Endeavour Energy, *Revised Regulatory Proposal – 1 July 2015 to 30 June 2019*, pp. 79, 87 and 88.

⁶⁸ AER, *Final Decision – Endeavour Energy distribution determination 2015–16 to 2018–19*, April 2015, pp. 34-36.

⁶⁹ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.164.

⁷⁰ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p.164.

⁷¹ AER, *Final Decision – Endeavour Energy distribution determination 2015–16 to 2018–19*, Attachment 7 – Operating Expenditure, April 2015, pp. 7-25.

⁷² AER, *Final Decision – Endeavour Energy distribution determination 2015–16 to 2018–19*, Attachment 7 – Operating Expenditure, April 2015, pp. 7-25.

⁷³ Deloitte Access Economics, *NSW Distribution Network Service Providers Labour Analysis*, November 2014, pp. i-v; Deloitte Access Economics, *NSW Distribution Network Service Providers Labour Analysis: addendum to 2014 report*, April 2015, pp. ii–vii.

In its remittal proposal, Endeavour highlighted the success of its transformation program in improving the efficiency of its workforce and achieving a sustainable level of opex consistent with our 2015 final decision:⁷⁴

...through the Endeavour 2020 initiatives we have reduced our FTEs, in excess of the AER's opex allowance, from 369 to zero. Since 2012, we have reduced our workforce by almost 1,000 FTEs to make our business more efficient.

Endeavour further noted:⁷⁵

Reducing our FTEs has resulted in higher opex amounts in the earlier years of the 2014-19 period. The short-term cost increases, particularly in 2015-16, are associated with exiting staff and restructuring which was required to deliver longer-term opex savings. The benefits of these are forecast to be realised in the 2017-18 opex which is \$64.1 million (real, 2018-19) below our opex in the 2013-14 year. As 2017-18 is our base year for forecasting purposes, these benefits will continue to be passed through to customers over the 2019-24 period.

Finally, Endeavour notes that it will be able to sustain the level of cost savings in opex achieved by 2017–18 into the next 2019–24 regulatory control period:⁷⁶

In our 2017 Directions Paper, which sets out key aspects of our 2019-24 regulatory proposal, we committed to locking in opex savings arising from achieving at least the AER allowed opex for the 2017/18 financial year...[such that]...the opex for the 2019-24 regulatory control period will be determined using the AER's opex forecasting model based on our 2017/18 actual opex.

Taken together, this information shows that over the current period Endeavour is achieving reductions in its recurrent opex through ongoing efficiencies in various opex categories. As the cost of implementing these reforms decreases (i.e. redundancy costs), Endeavour will achieve an efficient level of opex that allows it to meet its regulatory obligations and that can be sustained into the future.

This provides further evidence that Endeavour's proposed 2017–18 base opex is not materially inefficient and is consistent with the opex criteria.

Economic benchmarking analysis

In this section, we use economic benchmarking as supporting analysis to further test the efficiency of Endeavour's 2017–18 proposed base year. Benchmarking broadly refers to the practice of comparing the economic performance of a group of service providers that all provide the same service as a means of assessing their relative performance. Our 2017 annual benchmarking report includes information about the

⁷⁴ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p. 164-165.

⁷⁵ Endeavour Energy, *Regulatory Proposal 1 July 2019 to 30 June 2024*, April 2018, p. 164-165.

⁷⁶ Endeavour Energy, *Proposal for the remittal of the Endeavour Energy 2014-19 Determination*, 5 April 2018, p. 4.

use and purpose of economic benchmarking, and details about the techniques we use to benchmark the efficiency of DNSPs in the NEM.⁷⁷

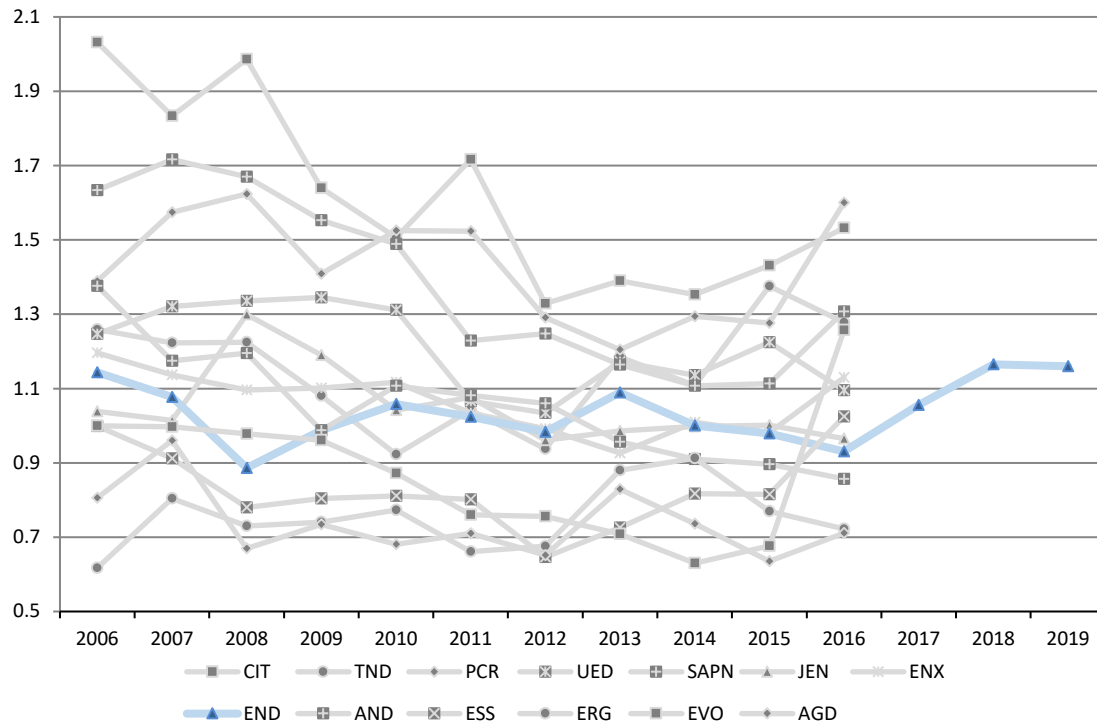
Figure 6.6 compares estimates of Endeavour's opex Multi-lateral Partial Factor Productivity (MPFP) (the blue line) in 2016–17, 2017–18, 2018–19 to the business' own productivity over time and that of other networks (the grey lines) in 2016 and earlier. These estimates are based on Endeavour's actual opex in 2016–17 and opex estimates for 2017–18 and 2018–19.

Figure 6.6 shows that Endeavour's opex MPFP (the blue line) increases significantly in 2016–17 and 2017–18, then remains relatively steady in 2018–19. These results indicate that Endeavour's target opex for 2017–18 represents a significant improvement in opex productivity relative to the level Endeavour achieved in 2012–13 (the base year for our 2015 final decision), and relative to other networks (the grey lines) as measured in 2015–16. Endeavour's proposed base year opex would represent an increase in its opex MPFP performance relative to other networks from 10th place in 2015–16 to 6th place in 2017–18.

These benchmarking results support our view that Endeavour's proposed 2017–18 base opex target is not materially inefficient.

⁷⁷ AER, *Annual Benchmarking Report for electricity distribution network service providers*, November 2017. Available at <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/annual-benchmarking-report-2017>

Figure 6.6 Opex multilateral partial factor productivity (MPFP)



Source: Economic Insights Memorandum Assessment of Endeavour Energy’s proposed base year opex, 16 July 2018. Data is collected from the Economic Benchmarking RIN.

Note: The chart uses Endeavour Energy’s actual opex up to 2016-17 and opex forecasts for 2017-18, and results for all other networks up until 2016 (from our 2017 published benchmarking report).

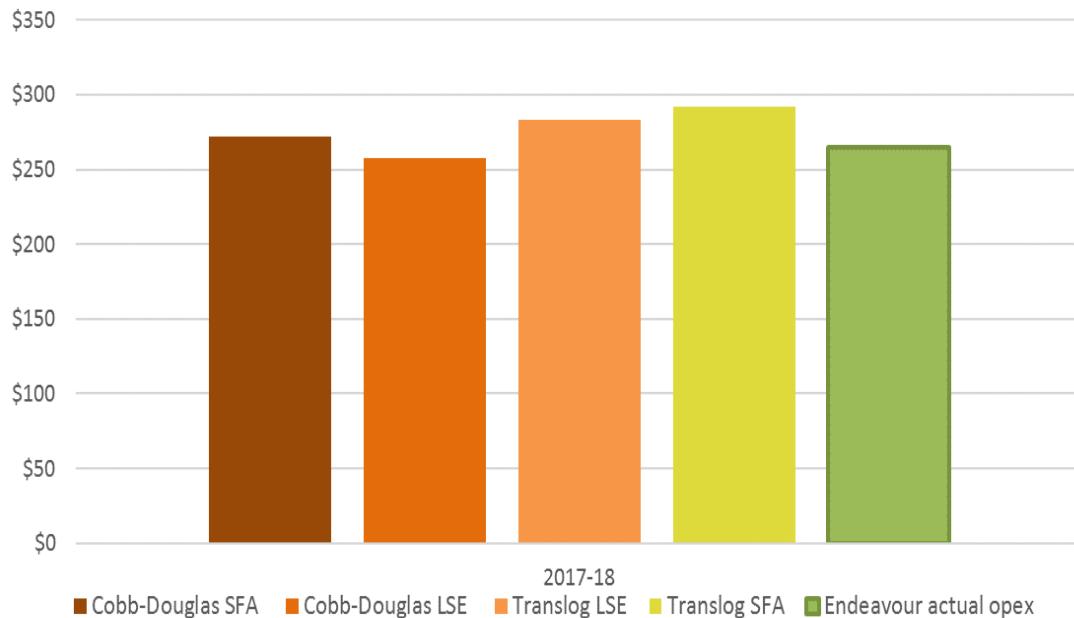
We further examine the efficiency of Endeavour's 2017–18 opex using the results of our econometric modelling. Among other things, our econometric models produce average opex efficiency scores for distributors across the 2011–17 period.⁷⁸ We use these results to estimate the 2017–18 costs of a benchmark service provider operating in Endeavour's circumstances, and compare this to Endeavour's proposed 2017–18 base year opex. Where Endeavour's proposed opex is similar to, or below the estimated opex of a benchmark service operator, this gives us confidence that Endeavour's opex is not materially inefficient.

Figure 6.7 presents the benchmark opex from each of our four econometric models, and compares them to Endeavour's estimated opex in 2017–18. This shows that Endeavour's estimated opex in 2017–18 is slightly below the average opex from our four models. This suggests that Endeavour's proposed opex in 2017–18 is not

⁷⁸ We have used the 2011–17 period because the data across this six year period provides for statistically robust benchmarking results and also provides a relatively current estimate of opex efficiency. We note it may take some time for improvements in efficiency by previously poor performing distributors to be reflected in the efficiency scores. For more detail, please see our 2018 annual benchmarking report for distribution service providers that we will publish by the end of November 2018.

materially inefficient when compared to its peers. This is consistent with our observations of Endeavour's opex MPFP results.

Figure 6.7 Estimated benchmark opex and Endeavour Energy's estimated actual opex in 2017–18 (\$million, \$2018–19)



Source: AER analysis

To derive our estimates of opex of a benchmark service operator as shown in Figure 6.7, we follow the following steps for each of the four sets of econometric modelling:

- We first average Endeavour's actual opex over the 2011–17 period.
- We then compare Endeavour's efficiency score over 2011–17, against a benchmark comparison score of 0.75. This reflects the upper quartile of possible efficiency scores, and reflects our conservative approach to setting a benchmark comparison point. This is consistent with the comparison point we adopted in our April 2015 decision.⁷⁹
- We then adjust the benchmark comparison point for potential differences in operating environment factors (OEFs) between Endeavour and the reference firms.⁸⁰ For the purposes of this decision, we have chosen to adopt the OEFs we

⁷⁹ See AER, *Ausgrid Final Decision 2015-19, Attachment 7 Operating Expenditure*, April 2015, p. 7-276

⁸⁰ Operating environment factors (OEFs) are factors that our benchmarking models do not directly account for (e.g. climate, geography, legislative obligations). These may materially affect the operating costs in different jurisdictions and hence may have an impact on our measures of the relative efficiency of each DNSP. For the purpose of this decision, we have not updated the OEF adjustment made relative to the chosen benchmark reference group from our April 2015 decision.

applied in our April 2015 decision. This is a conservative estimate of the impact of OEFs as it accounts for both material and immaterial factors.⁸¹

- Where Endeavour's efficiency score is below the adjusted benchmark comparison score, we adjust Endeavour's average level of opex over 2011–17 by the difference between the two efficiency scores. This results in an estimate of period-average opex that we consider is not materially inefficient at the midpoint of 2011-17 period.
- We then roll forward this period-average opex estimate to a 2017–18 base year using the rate of change. This results in an estimate of opex that we consider is not materially inefficient in 2017–18.

These calculations are set out in a spreadsheet that we have published alongside this draft decision.

Base opex adjustments

To finalise our estimate of base opex for the initial year, we remove the movements in provisions. This ensures we base our alternative estimate on the actual costs incurred by the business, and not provisions the business set aside for liabilities it has yet to pay out. Endeavour will report its actual movements in provisions for 2017-18 when it submits its regulatory accounts in October 2018. We will update this estimate in our final decision.

6.4.2 Rate of change

Having determined an efficient starting point, or base opex, we trend it forward to account for the forecast growth in prices, output and productivity. We refer to this as the rate of change.

For the purpose of this draft decision, we have largely applied our standard approach to forecasting the rate of change. Specifically we have:

- Used a weighted average of forecast labour price growth and non-labour price growth to determine price growth.
- Used output weights derived from the results of the four benchmarking models we presented in our 2017 annual benchmarking report. This is a refinement of our previous approach, which used the weights from a single econometric model.
- Applied a zero productivity growth forecast.

⁸¹ In October 2018, we published a report from our consultants Sapere Research Group and Merz Consulting (Sapere-Merz) that reviewed material differences in operating environments in the NEM. The report identified a limited number of OEFs that materially affect the costs of each DNSP in the NEM. However, Sapere-Merz acknowledged that its analysis was preliminary and could be improved through better data. We intend to consult further with the distribution industry to further refine the assessment and quantification of OEFs.

We have forecast an average annual rate of change of 2.3 per cent, compared to Endeavour's forecast of 3.1 per cent. The reasons for our forecast, and its difference compared to Endeavour's forecast, are set out below.

We are currently conducting an industry-wide review of our approach to forecasting productivity. This is a result of our observations that productivity has grown over three per cent each year (since 2012) across the distribution industry. This is also consistent with our expectations that distributors would make positive productivity growth in the medium to long term (historical productivity growth has been negative).

Further, we have received feedback from various parties suggesting we review this aspect of the rate of change.⁸² CCP10, for example, has submitted that a zero per cent productivity growth rate is not in the best interests of customers and that there is evidence to support the use of a positive productivity growth forecast.⁸³

Our review may change our approach to forecasting productivity going forward. As part of this review, we will consult with all distributors and any other interested stakeholders.⁸⁴ Stakeholders will be given multiple opportunities to engage in the review and provide us with their views.

Our final decision for Endeavour will take the outcome of this review into consideration.

Forecast price growth

A network's price growth forecast depends on the forecast rate of growth in its labour and non-labour costs over the period. CCP10 notes Endeavour's proposal includes a relatively higher rate of growth in labour costs (real wage price growth) compared with the other NSW networks:⁸⁵

Endeavour Energy is projecting a significantly higher rate of growth in real wages than the other businesses - a cumulative increase of 12% over the 6 years to 2023-24 real wages and salaries compared to 8% and 7% for Ausgrid and Essential, respectively.

We have included forecast real average annual price growth of 0.6 per cent in developing our alternative opex estimate. This increases opex from the base year by \$20.8 million (\$2018–19). In contrast, Endeavour forecast average annual price growth of 1.3 per cent, which increases opex from the base year by \$57.2 million (\$2018–19).

⁸² AGL - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 September 2018, p.4; CCP10 - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 8 August 2019, pp.30–31; ECA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 August 2018, p.13; EUAA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 10 August 2018, p.11.

⁸³ Consumer Challenge Panel (Subpanel 10), CCP10 Response to AER Issues paper and revenue Proposals for NSW Electricity Distribution Businesses 2019-24, August 2018, pp.30-31.

⁸⁴ See <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-our-approach-to-forecasting-opex-productivity-growth-for-electricity-distributors>.

⁸⁵ Consumer Challenge Panel subpanel 10, CCP10 Response to AER Issues paper and revenue Proposals for NSW Electricity Distribution Businesses 2019-24, 8 August 2018, p.28.

Our price growth forecast is a weighted average of forecast labour price growth and non-labour price growth.

- To forecast labour price growth, we have used the average forecast growth in the wage price index (WPI) for the New South Wales utilities industry from our consultant Deloitte Access Economics and Endeavour's consultant, BIS Oxford Economics.⁸⁶ However, BIS Oxford Economics removed forecast inflation rate of 1.8 per cent over the 2019–24 period from its nominal price growth forecast to calculate real price growth.⁸⁷ We have updated this to 2.4 per cent in line with our standard inflation approach.⁸⁸ This is consistent with the approach Endeavour and we used to calculate the rate of return.⁸⁹ In contrast, Endeavour applied a single WPI forecast by its consultant BIS Oxford Economics.
- To forecast non-labour price growth, we, like Endeavour, have applied the forecast change in CPI.

We have applied our standard benchmark weight approach to account for the proportion of opex that is labour and the proportion that is non-labour (59.7:40.3). We apply this across all network service providers. Our reasons for adopting these weights are set out in our 2017 Benchmarking report.⁹⁰ Endeavour stated it adopted the AER's benchmark labour weights using the values in the AER's 2017 Benchmarking report.⁹¹ However, it weighted the proportion of opex that is labour to non-labour at 64.8 to 35.2 per cent, which is consistent with the weights used in our 2014 Benchmarking report.

Forecast output growth

We have included forecast average annual output growth of 1.7 per cent in developing our alternative estimate of forecast opex. This increased opex from the base year by \$71.7 million (\$2018–19). Our output growth forecast is an average of the output growth rates forecast using the specification and estimated weights from the four models presented in our 2017 annual benchmarking report. These models are:⁹²

- Opex MPFP
- Cobb Douglas stochastic frontier analysis (SFACD)

⁸⁶ Deloitte Access Economics, *Labour Price Growth Forecasts Prepared for the Australian Energy Regulator*, 19 July 2018, Table vii, p. xiv; Endeavour Energy - *Attachment 0.1 - BIS - Real cost escalation factors*, September 2017.

⁸⁷ Endeavour Energy - *Attachment 0.1 - BIS - Real cost escalation factors*, September 2017, p.2.

⁸⁸ Our estimate of expected inflation is a combination of the available Reserve Bank of Australia (RBA) forecasts with the RBA's target band. More information can be found here: <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017/aer-position>.

⁸⁹ AER – Endeavour Energy 2019-24 - Draft decision - Attachment 3 - Rate of return - November 2018; Endeavour Energy - *0.01 Regulatory proposal*, April 2018, p.179.

⁹⁰ Economic Insights, *Economic Benchmarking Results for the Australian Energy Regulator's 2017 DNSP Benchmarking Report*, 31 October 2017, pp. 1–2. This is also consistent with the weights in our 2018 annual benchmarking report, which will be published before the end of November 2018.

⁹¹ Endeavour Energy - *0.01 Regulatory proposal*, April 2018, p.171.

⁹² Economic Insights, *Economic Benchmarking Results for the Australian Energy Regulator's 2017 DNSP Benchmarking Report*, 31 October 2017, p.1 and pp.18–20.

- Cobb Douglas least squares estimation (LSECD)
- Translog least squares estimation (LSETLG).

Table 6.4 shows the output specification and weights from each model as reflected in the 2017 annual benchmarking report.⁹³

Table 6.4 Output specification and weights derived from economic benchmarking models

Output	MPFP	SFACD	LSECD	LSETLG
Customer numbers	45.8%	77.1%	69.7%	59.8%
Circuit length	23.8%	9.7%	11.2%	11.2%
Ratcheted maximum demand	17.6%	13.1%	19.1%	28.9%
Energy throughput	12.8%			

Source: AER analysis; Economic Insights, Economic Benchmarking Results for the Australian Energy Regulator's 2017 DNSP Benchmarking Report, 31 October 2017.

We have forecast our year on year output growth by:

- Calculating four model specific output growth rates, each as a weighted average growth in specified outputs.⁹⁴ For example, the output growth rate based on the MPFP model is a weighted average of growth in customer numbers, circuit length, ratcheted maximum demand and energy throughput; and that based on SFACD model is a weighted average of growth in customer numbers, circuit length and ratcheted maximum demand.
- Calculating the average of four model specific output growth rates.

This is a refinement of our previous approach, which only used the output weights from a single econometric model (the SFACD model).⁹⁵ In contrast, Endeavour used customer numbers, circuit length and ratcheted maximum demand as outputs, consistent with our previous approach.⁹⁶ It then applied weights of 67.6, 10.7 and 21.7 per cent respectively, which we determined in our 2014 annual benchmarking report.⁹⁷

⁹³ We will release our 2018 annual benchmarking report by the end of November 2018, which contains updated output weights. Stakeholders will have the opportunity to comment on the benchmarking results, including these weights, before the report is finalised. In our final decision, we will likely update the output weights we apply in our opex forecast to reflect the finalised 2018 annual benchmarking report. Endeavour Energy will also have an opportunity to update its output weights in its revised proposal.

⁹⁴ We adopted Endeavour's forecasts growth in customer numbers, circuit line length, energy throughput, and ratcheted maximum demand.

⁹⁵ This previous approach was used to inform our alternative forecast in our April 2015 decision.

⁹⁶ Endeavour Energy - *0.01 Regulatory proposal*, April 2018, p.173.

⁹⁷ Endeavour Energy - *0.01 Regulatory proposal*, April 2018, p.173; AER, *Annual Benchmarking Report for electricity distribution network service providers*, November 2014.

CCP10 recently raised concerns about the weight applied to customer numbers under our previous approach. In its submission on Evoenergy's regulatory proposal, CCP10 stated that trend customer growth accounts for a significant part of Evoenergy's output growth. It noted that this outcome flows from our underlying econometric model. CCP 10 encouraged us to test whether our output growth rates are reasonable, and whether too much weight has been allocated to customer numbers when we forecast output growth.⁹⁸

We have reviewed the output weights derived from the four models presented in our economic benchmarking reports over the period 2014–17. Our review shows that the weight of customer numbers derived from the SFACD model is relatively high and it has increased over time. The customer numbers weight does not increase as much in the other econometric models (LSECD and LSETLG).⁹⁹

Our refined approach, which uses an average of the output weights from the four models, helps to address concerns raised by the Australian Competition Tribunal (the Tribunal) in its merits review of our 2015 decision for NSW electricity determinations.

The Tribunal raised concerns about our reliance on a single model and in remitting the NSW decisions directed us to use a broader range of modelling and benchmarking.¹⁰⁰

We are currently updating our economic benchmarking analysis to incorporate data for 2016–17. We will publish this analysis in our 2018 annual benchmarking report in late November 2018. In our final decision, we will update our forecast output growth to reflect the 2018 benchmarking results.

Full details of our refined approach to forecast output growth are set out in our opex model, which is available on our website.

Forecast productivity growth

For the draft decision, we have forecast zero productivity growth in our alternative opex forecast. This is consistent with Endeavour's regulatory proposal, and our standard approach to forecasting productivity.¹⁰¹

⁹⁸ Consumer challenge Panel (subpanel 10), *Response to Evoenergy regulatory proposal 2019-24 and AER issues paper* - 16 May 2018, p. 10.

⁹⁹ We note that the weights from the MPFP model have remained constant over time. The MPFP model is a functional output index number model. It is the standard practice with such models to estimate the output cost shares initially (using cost functions based on the data available) and to then leave these shares constant for an extended period. This allows changes in the MPFP scores to reflect changes in performance (and possibly exogenous factors) only. Our 2018 annual benchmarking report will update outputs weights for the MPFP model.

¹⁰⁰ Applications by Public Interest Advocacy Centre Ltd and Essential Energy [2016] ACompT 3, direction 1(a). The Tribunal's decision was upheld by the Full Federal Court. For more details, see: *Australian Energy Regulator v Australian Competition Tribunal (No 2)* [2017] FCAFC 79, [285].

¹⁰¹ <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-our-approach-to-forecasting-opex-productivity-growth-for-electricity-distributors>.

In response to Endeavour's proposal, Origin, CCP10, AGL Energy, ECA, and EUAA stated the AER should reconsider our standard approach of forecasting zero productivity growth.¹⁰² They consider that firms in competitive markets should expect positive productivity improvements.

Endeavour subsequently stated that it understood some stakeholders considered a productivity factor was necessary in setting an acceptable opex allowance. However, it was strongly of the view that its forecasts already included explicit efficiencies.¹⁰³

We note that there will be an opportunity to consider this further as a part of industry wide productivity forecasting consultation process outlined above and as a part of the final decision.

6.4.3 Step changes

We add (or subtract) step changes for any costs are not captured in base opex or the rate of change that are required for forecast opex to meet the opex criteria.¹⁰⁴ In the absence of a change to regulatory obligations or a legitimate capex/opex trade-off opportunity, we would accept a step change under limited circumstances.

Endeavour has not proposed any step changes.

6.4.4 Category specific forecasts

We have included a category specific forecast for debt raising costs.

Debt raising costs

We have included debt raising cost of \$16.6 million (\$2018–19) in our alternative opex forecast. Debt raising costs are transaction costs incurred each time a business raises or refinances debt. Our preferred approach is to forecast debt raising costs using a benchmarking approach rather than a service provider's actual costs in a single year. This provides for consistency with the forecast of the cost of debt in the rate of return building block. We discuss this in attachment 3 of this determination.

¹⁰² AGL - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 September 2018, p.4; CCP10 - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 8 August 2019, pp.30–31; ECA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 14 August 2018, p.13; EUAA - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 10 August 2018, p.11; Origin - *Submission on Endeavour Energy 2019–24 regulatory proposal*, 8 August 2018.

¹⁰³ Endeavour Energy, *Response to AER issues paper, NSW electricity distribution determinations 2019–24*, 30 August 2018, p.9.

¹⁰⁴ AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 24.

6.4.5 Assessment of opex factors under NER

Opex factor	Consideration
The most recent annual benchmarking report that has been published under rule 6.27 and the benchmark operating expenditure that would be incurred by an efficient distribution network service provider over the relevant regulatory control period. ¹⁰⁵	<p>There are two elements to this factor. First, we must have regard to the most recent annual benchmarking report. Second, we must have regard to the benchmark operating expenditure that would be incurred by an efficient distribution network service provider over the period. The annual benchmarking report is intended to provide an annual snapshot of the relative efficiency of each service provider.</p> <p>We have estimated the benchmark opex that an efficient service provider would require over the forecast period and have compared our estimate with Endeavour Energy's proposal over the relevant regulatory control period. In doing this we relied on approaches set out in our most recent benchmarking report and in work by Economic Insights commissioned for this decision.</p>
The actual and expected operating expenditure of the Distribution Network Service Provider during any preceding regulatory control periods. ¹⁰⁶	<p>Our forecasting approach uses Endeavour Energy's estimated opex in 2017-18 as the starting point. We have examined Endeavour Energy's historical expenditure to form a view about whether or not its revealed expenditure is sufficiently efficient to rely on it as the basis for forecasting required opex in the forthcoming period.</p>
The extent to which the operating expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the Distribution Network Service Provider in the course of its engagement with electricity consumers. ¹⁰⁷	<p>We understand the intention of this particular factor is to require us to have regard to the extent to which service providers have engaged with consumers in preparing their regulatory proposals, such that they factor in the needs of consumers.¹⁰⁸</p> <p>Based on the information provided by Endeavour Energy in its proposal and CCP10's advice, we consider Endeavour Energy consulted extensively in developing its regulatory proposal.</p>
The relative prices of capital and operating inputs. ¹⁰⁹	<p>We adopted price escalation factors that account for the relative prices of opex and capex inputs.</p>
The substitution possibilities between operating and capital expenditure. ¹¹⁰	<p>Endeavour has not proposed specific opex for non-network alternatives (i.e. a step change) but notes it will trial non-network and demand management solutions in the 2019-24 period as part of its capex program and these have informed its capex forecasts.</p>
Whether the operating expenditure forecast is consistent with any incentive scheme or schemes that apply to the Distribution Network Service Provider under clauses 6.5.8 or 6.6.2 to 6.6.4. ¹¹¹	<p>We normally apply the EBSS in conjunction with our revealed cost forecasting approach. Endeavour Energy had an EBSS in place over the 2014-19 regulatory control period. We have reapplied the EBSS for the 2019-24 period.</p>

¹⁰⁵ NER, cl. 6.5.6(e)(4).

¹⁰⁶ NER, cl.6.5.6(e)(5).

¹⁰⁷ NER, cl.6.5.6(e)(5A).

¹⁰⁸ AEMC, Rule Determination, 29 November 2012, pp. 101, 115.

¹⁰⁹ NER, cl.6.5.6(e)(6).

¹¹⁰ NER, cl.6.5.6(e)(7).

¹¹¹ NER, cl.6.5.6(e)(8).

Opex factor	Consideration
<p>The extent the operating expenditure forecast is referable to arrangements with a person other than the Distribution Network Service Provider that, in the opinion of the AER, do not reflect arm's length terms.¹¹²</p>	<p>Some of our techniques assess the total expenditure efficiency of service providers and some assess the total opex efficiency. Given this, we are not necessarily concerned whether arrangements do or do not reflect arm's length terms. A service provider which uses related party providers could be efficient or it could be inefficient. Likewise, for a service provider who does not use related party providers. If a service provider is inefficient, we adjust their total forecast opex proposal, regardless of their arrangements with related providers.</p>
<p>Whether the operating expenditure forecast includes an amount relating to a project that should more appropriately be included as a contingent project under clause 6.6A.1(b).¹¹³</p>	<p>This factor is generally only relevant in the context of assessing proposed step changes (which may be explicit projects or programs). We did not identify any contingent projects in reaching our draft decision.</p>
<p>The extent the Distribution Network Service Provider has considered, and made provision for, efficient and prudent non-network options.¹¹⁴</p>	<p>Endeavour has not proposed specific opex for non-network alternatives (i.e. a step change) but notes it will trial non-network and demand management solutions in the 2019-24 period as part of its capex program and these have informed its capex forecasts.</p>
<p>Any relevant final project assessment report (as defined in clause 5.10.2) published under clause 5.17.4(o), (p) or (s).¹¹⁵</p>	<p>In having regard to this factor, we identify any RIT-D project submitted by the business and ensure the conclusions are appropriately addressed in the total forecast opex. Endeavour Energy did not submit any RIT-D project for its distribution network.</p>

¹¹² NER, cl.6.5.6(e)(9).

¹¹³ NER, cl.6.5.6(e)(9A).

¹¹⁴ NER, cl.6.5.6(e)(10).

¹¹⁵ NER, cl.6.5.6(e)(11).