



Forecasting opex productivity growth

**Submission to AER's draft decision on pre-emptive
productivity adjustment**

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1 Executive summary

CitiPower, Powercor and United Energy welcome the opportunity to respond to the Australian Energy Regulator's (AER) draft decision on pre-emptive productivity adjustment (**Draft Decision**).

We are three of the most efficient electricity distributors in Australia and are proud of our achievements in delivering savings and benefits to customers over time. Our customers pay among the lowest distribution charges in the National Electricity Market (NEM) while we deliver a safe network that is available more than 99.9% of the time.

Because we are the frontier firms in Australia, any pre-emptive productivity adjustment will put the highest pressure on our networks to continue to meet obligations, and deliver services our customers want and need, at lower cost. A pre-emptive productivity adjustment that is too high will likely incentivise us to inefficiently manage the network, increasing the risk of poorer customer service.

After consideration of the draft decision, our submission seeks to highlight the risks of excessive productivity adjustments to an efficient operator, and recommends an approach that is best practice in reducing those risks:

- We are concerned much of the draft decision, the AER's consultation process and the behaviour of some stakeholders surrounding this issue is opportunistic and goal-seeking a pre-set number. Opportunistic behaviour has no place in, and is the biggest risk to, best practice responsible regulation that is designed for the long-term benefit to consumers.
- Using short-term historical data to penalise network businesses for making efficiency savings will reduce investment in the distribution sector that is in the midst of significant change and needs affordable investment to sustain the transition.
- The consultation process adopted to date is inadequate and has not provided all stakeholders with equal opportunity to comment. The consultation process has been made more difficult by the publication of updated data half-way through the process, without indication from the AER how it plans to use the data. It is unclear how this approach meets AER's expectations on stakeholder engagement.
- A move to 'cost plus' regulation is undermining the existing regulatory framework and is not in the long-term interests of customers. A pattern is emerging across regulatory decisions that strongly favours limiting or removing opportunity for out-performance across tax, rate of return and now operating expenditure. These changes are increasing regulatory risk in the sector and will result in higher long-term costs to consumers.
- Measuring productivity is an imprecise 'art' but there are internationally recognised best-practice approaches that can be applied in Australia. The AER has however chosen to put weight on biased short-term models and data that are not suitable, which is alarming to us as frontier firms. It is also unclear whether the AER plans to use the same final decision, based on outdated data, for the Victorian decisions.
- To reduce the risk of an excessive productivity adjustment, the AER should forecast productivity using econometric modelling of the electricity distribution sector, over the longest term possible, and continue to update the data for each regulatory decision. This will ensure stability in the *method* used while each decision will be based on the most recent data.

Our submission is accompanied by an analysis prepared by NERA that provides a detailed review of model and data used in the draft decision as well as a report by Houston Kemp on forecasting productivity.¹

¹ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018; Houston Kemp, *Pre-emptive productivity adjustments*, prepared for Jemena, AusNet Services, SA Power Networks, CitiPower, Powercor Australia and United Energy, 8 May 2018.

2 AER's decision making

The effectiveness of a regulatory framework and the long-term benefit to consumers is dependent on stable, predictable and evidence-based decision making by a responsible regulator. Decision making that diverts from these principles is likely to result in lack of investor confidence, perverse incentives and ultimately higher regulatory risk that consumers have to bear.

In this section we raise concerns over the AER's decision making on the pre-emptive productivity adjustment that is likely to result in higher regulatory risk and increase costs to consumers in the long-term.

2.1 AER's consultation process is below standard

The consultation process undertaken by the AER in forecasting a pre-emptive productivity adjustment, to date, fails to meet best practice standard for reasons discussed below.

2.1.1 Going straight to draft decision

The AER has only published a draft decision with a recommendation, without conducting its usual steps to allow for a meaningful consultation, such as:

- publishing a consultation paper or an issues paper
- collecting stakeholder feedback on the key issues raised
- using stakeholder feedback to develop a draft position
- finalising its decision based on stakeholder feedback on the draft.

This truncated consultation process is not sufficient to develop a reasonable decision as it provides stakeholders only limited ability to assess the key issues and develop positions. This is particularly important given the magnitude of the adjustment being proposed is in excess of \$70 million for our businesses.

2.1.2 Providing updated data half-way through the consultation

The draft decision was published on 9 November 2018 with the consultation period ending on 21 December 2018. The draft decision was based on 2017 Benchmarking Report data as the most recently available data at the time.

However, in late November 2018 the AER published the 2018 Benchmarking Report, which included updated results to be used in the AER's final decision. The AER has not provided any guidance on how the updated data will be used in the final decision or offered to provide an alternative recommendation based on the updated data.

Consequently, stakeholder feedback and responses are likely to be based on outdated data or a guess of how the AER plans to update the data before the final decision.

2.1.3 Consultation in isolation of the remainder of the regulatory framework

The consultation undertaken on pre-emptive productivity does not consider its inter-relationship with other aspects of the regulatory framework and the likely impact on incentives.

Distributors are currently incentivised to improve efficiency of operations and keep a share of the savings. However, if distributors' own efficiency-improving actions are used to develop future productivity adjustments, distributors may be incentivised to change behaviour inefficiently which would result in higher long-term costs to consumers.

Additionally, the incentive framework has a number of checks and balances to ensure distributors only pursue genuine efficiencies. For example, if distributors outperform in terms of operating expenditure at the expense of service performance or capital expenditure there is an equal and offsetting penalty that negates the efficiency

benefit sharing benefit. A pre-emptive productivity adjustment however dilutes that balance such that distributors may inefficiently cut operating expenditure at the expense of service performance and/or capital expenditure.

Lastly, pre-emptive productivity adjustments are strongly linked to investment sentiment and the regulated rate of return calculation. Changes in approaches in the measuring pre-emptive productivity adjustments should therefore be reflected in the regulated rate of return, and other relevant elements of the framework. Failing to do so would lead to increased regulatory risk and higher long-term costs to consumers.

2.1.4 Draft decision is based on flawed assumptions

The AER's draft decision is based on a flawed underlying assumption that measured productivity of both competitive markets and regulated entities must be positive. To support this flawed assumption the AER has:

- made a biased selection of the most relevant period for measuring the multilateral partial factor productivity (**MPFP**) without supporting evidence for its decision
- provided an options analysis that includes some flawed interpretations of the 2017 Benchmarking Report data, economically unviable analysis and analysis that does not meet the AER's own criteria
- not holistically examined all evidence by excluding evidence of negative productivity growth.

Given the above evidence of below standard consultation and analysis on a topic of high risk of distorting incentives and behaviour, we question whether the AER is potentially exercising the use of its discretion inappropriately.

2.2 Some stakeholders have been treated preferentially

There is evidence the AER has treated the views of the Consumer Challenge Panel (**CCP**) (and potentially other consumer representative groups) preferentially by meeting with them to discuss the topic well in advance of the release of the draft decision. There is also evidence that discussions with the CCP were of the nature of setting a number for a positive adjustment.

This approach discriminates against other stakeholders who are directly affected by the decision. More critically, it provides those preferred stakeholders with privy information to potential shifts in listed companies' operating expenditure that they can use to trade in listed entities impacted by the draft decision.

2.3 Poor industry practices increase investment risk and lead to higher costs to consumers in the long-term

Infrastructure privatisation is internationally recognised as being in the long-term interest of consumers as it delivers sustainable long-run efficiencies. This is largely evidenced by the AER's own benchmarking findings.

However, private investors are more sensitive to regulatory discretion as exercise of discretion can adversely impact the value and the risk profile of the business, increasing investment and borrowing costs and ultimately increasing the long-term cost to consumers. This contrasts with government owned entities where their owners are able to absorb regulatory discretion through the ability to control the exercise of that discretion.

We are concerned that since the abolishment of the Limited Merits Review (**LMR**) the AER has demonstrated an increasingly adversarial approach to distributors, evidenced through the recent tax review, the rate of return review and now the pre-emptive productivity review. All three reviews demonstrate a shift towards 'cost plus' regulation and away from a 'light handed' incentive-based regulatory framework investors believed they were part of. As a result, we expect the equity markets will respond promptly by increasing the risk profiles of Australian private entities and debt will become harder to source—costs which consumers will ultimately bear.

2.3.1 Incentives to make efficiency savings are reduced

In its 2018 Benchmarking Report, the AER states:²

The benchmarking results also provide network owners and investors with useful information on the relative efficiency of the electricity networks they own and invest in. This information, in conjunction with the financial rewards available to businesses under the regulatory framework and business profit maximising incentives, can facilitate reforms to improve network efficiency that can lead to lower network costs and retail prices.

This statement is only true if the investors are confident their financial rewards from profit maximising behaviour will not be *clawed back* by the regulator. Claw back includes using investors' efficiency savings during a targeted short period to base claims for limiting future financial rewards, while providing no compensation for periods of falling productivity.

As the energy sector continues to transform, private investment will be essential to the sector's smooth transition. Exercise of discretion, like the proposed high pre-emptive productivity adjustment, will lead to higher-risk profiles, costlier and fewer investment opportunities, and ultimately higher costs to consumers.

² AER, *Annual Benchmarking Report, Electricity distribution network service providers*, November 2018, p. 6.

3 Incentive-based regulation

Under the revenue and pricing principles of the National Electricity Law (**NEL**) the AER should provide distributors with a reasonable opportunity to recover at least the efficient cost required to provide network services and comply with regulations. In 2013, the AER, in consultation with stakeholders, developed the Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution. As part of the framework, pre-emptive productivity adjustments must only represent a shift in operating expenditure productivity that is achievable by all distributors.

However, measuring and forecasting productivity is notoriously difficult and incorrectly high adjustments are likely to distort incentives and profit maximising behaviour. In this section we highlight the long-term benefits to consumers from allowing the existing regulatory framework to deliver efficiencies, and the risks to consumers resulting from distorted incentives and behaviour.

3.1 Existing incentive-based regulation framework is in the long-term interest to consumers

The AER has continuously indicated its preference for 'light-handed' incentive-based regulatory framework. In its Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution, the AER states:³

The incentive based regulatory framework aims to facilitate the NEO and the revenue and pricing principles by ensuring DNSPs are appropriately incentivised to provide, and are compensated for providing, electricity services efficiently so that consumers receive the level of service they expect at the lowest long run cost. It does this by rewarding DNSPs for maintaining service standards while spending less in a regulatory control period than the expenditure allowance that we determine. For this reason, we must consider whether DNSPs are responding to incentives and providing distribution services efficiently.

The AER further states:⁴

If a DNSP operated under an effective incentive framework, actual past expenditure should be a good indicator of the efficient expenditure the NSP requires in the future. The ex-ante incentive regime provides an incentive to improve efficiency (that is, by spending less than the AER's allowance) because DNSPs can retain a portion of cost savings made during the regulatory control period. However, the incentive to spend less than our allowance must not be to the detriment of the quality of the services the DNSP supplies.

The incentive to reduce operating expenditure is the efficiency benefit sharing scheme (**EBSS**), under which customers keep 70% of the benefit in the long-term and distributors keep a 30% share. Under incentive-based regulation, distributors can deliver services customers need and want, and continue to meet obligations, while innovating and finding new solutions and opportunities to improve efficiencies.

As with any investment, the innovation in seeking efficiency carries risk which distributors bear in order to achieve savings. Distributors' incentive and reward for the undertaken risk is the 30% sharing in the long-term saving and customers keep the rest.

³ AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 8-9.

⁴ AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 11.

3.2 Customers do not fund productivity improvements

Customers benefit from an incentive-based framework by keeping 70% of the operating expenditure savings in the long-term. Customers are not expected to keep 100% of the savings as the framework requires distributors to self-fund efficiency improving initiatives rather than recover it from customers through allowances.

In its Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution, the AER states:⁵

We will not allow step changes for any short term cost to the DNSP of implementing efficiency improvements in expectation of being rewarded through expenditure incentive mechanisms such as the EBSS. We expect DNSPs to bear such costs and thereby make efficient trade-offs between bearing these costs and achieving future efficiencies.

Additional to step changes, the AER does not allow capital or operating expenditure related to implementing efficiency improvements. For example, the AER does not allow operating expenditure in the base year that is of a non-recurrent nature and reflects restructure costs, including redundancies. Equally, the AER does not allow capital expenditure, such as innovative IT solutions, aimed at reducing future operating costs.

3.2.1 Our efficiency improvement initiatives are self-funded

All our efficiency improvement initiatives have been at least partially self-funded. In 2015, CitiPower and Powercor undertook a 'World Class' savings program to implement a large number of efficiency initiatives, including investment in IT systems, a corporate restructure, re-negotiation of contracts and service providers, and changes in maintenance and inspection policies. We self-funded the following efficiency-improving IT systems:

- \$13.1 million in an automation of connection services through an IT application 'eConnect'
- \$14.6 million in an automated job platform 'Click' which is expected to deliver efficiencies in job allocation and completion.

The corporate restructure cost \$10 million which was not charged to customers.

In 2017, the merger between CitiPower, Powercor and United Energy resulted in further synergies and economies of scale which allowed us to reduce operating expenditure for the three networks. While customers have partially paid for staff redundancies they will continue to benefit from lower base operating expenditure in the future.

As customers do not fully fund projects that result in efficiency savings, the current incentive framework appropriately shares the EBSS benefits between customers and distributors. Using distributors' past performance to pre-emptively adjust for productivity is likely to result in distributors seeking to recover costs of necessary efficiency improvements from customers, effectively passing on the risk of innovative investment to customers. This is discussed in more detail in Section 3.4.

3.3 The AER does not fund all step changes

Incentive-based regulation allows the regulator to use benchmarking as an assessment tool rather than conducting forensic assessments of individual network's expenditure. Forensic assessments are inherently difficult, time-consuming and can be subjective. Conversely, benchmarking under incentives provides confidence

⁵ AER, *Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 16.

actual expenditure is converging towards the efficiency frontier, leading to lower costs to consumers in the long-term.

Because the framework allows incentives for savings, distributors are expected to absorb new cost challenges efficiently and without changes to allowances. Only material new cost challenges are allowed to be passed through as an additional allowance and only material step changes are allowed for expected future cost pressures. Both the pass-throughs and the step change opportunities are limited by an eligibility criteria. Therefore, even if the distributor responds to incentives to improve efficiency of costs, there may be increasing cost pressures that the distributor must absorb as part of its operations. Effectively, the distributor takes on the risk of providing services customers want and need and meeting obligations under constantly changing cost pressures.

Obligations on distributors tend to grow over time as customer expectations on safety and service grow. The AER acknowledges distributors may experience growing obligations under the incentive framework and states in its Better Regulation Explanatory Statement Expenditure Forecast Assessment Guideline for Electricity Distribution:⁶

If the step change was for the costs to meet a new regulatory obligation, it may be appropriate to provide a step change. Forecast opex should provide sufficient expenditure to comply with all applicable regulatory obligations or requirements. However, the productivity measure included in the rate of change may compensate the NSP for past regulatory changes. Where the historical change in outputs and inputs is used to derive forecast productivity, that forecast will be net of productivity losses driven by the increased inputs required to meet new regulatory obligations imposed over the sample period.

This implies increasing expenditure from growing regulatory obligations would result in negative productivity over that period, which would be reflected in a *positive* pre-emptive productivity adjustment that allows for more operating expenditure to account for future growing regulatory obligations.⁷ If the AER applies a *positive* productivity adjustment, the implication is the AER does not need to allow all step changes related to growing regulatory burden.

In practice however, the AER has never applied a *positive* pre-emptive productivity adjustment that allows for more operating expenditure. Since the implementation of the incentive-based framework, the AER has only applied a zero pre-emptive productivity adjustment to distributors under the assumption no competitive firm would operate under consistently negative productivity. This is unlike the regulator in New Zealand that has remunerated distributors for the likely future reductions in productivity due to increasing cost pressures, whether for regulation obligations or other reasons.⁸

Equally, despite stating in its draft decision that step changes are usually funded, the AER does not capture all step increases in expenditure, whether related to new regulatory obligations or other increasing cost pressures. For example, we have a legislative obligation to pay into superannuation funds for both defined benefits superannuation and accumulation members. The necessary funds vary year-on-year but are increasing as accumulation members replace guaranteed superannuation members over time. As the AER does not evaluate different categories of operating expenditure, it does not fund us for this increasing cost pressure.

⁶ AER, *Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 110.

⁷ A positive pre-emptive productivity adjustment would be added to the rate of change calculation as a positive number, resulting in a higher operating expenditure allowance.

⁸ New Zealand Commerce Commission, *Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020: Low cost forecasting approaches*, 28 November 2014, pp. 24-27.

Additionally, we must respond to rule changes made by the Australian Energy Market Commission (**AEMC**) and directives from the Victorian Government, Energy Safe Victoria (**ESV**) or the Essential Services Commission (**ESC**) during the regulatory period without an opportunity to recover those costs if not individually material when measured on an annual basis. Most recently, in January 2018, the Victorian Government directed us to pay \$2.7 million in Guaranteed Service Level (**GSL**) payments to customers who experienced outages above and beyond our regulatory obligations.

As such, the current regulatory framework does not oblige the AER to fund all step increases in operating expenditure and the AER has not compensated distributors for growing costs by allowing a *positive* pre-emptive productivity adjustment. This is important to note as distributors are facing increasing cost pressures over the next 10 years from the transition to distributed energy resources (**DER**) which they are required to fully absorb under the current regulatory framework.

3.4 Customers should not bear the risk of regulatory uncertainty

Given the AER does not remunerate distributors for all efficient cost increases, or increases related to directives, through either step changes or a *positive* pre-emptive productivity adjustment, it is appropriate for the AER to apply a zero productivity adjustment to ensure distributors are able to at least recover their efficient costs when cost pressures are increasing. Changes to this approach will create regulatory uncertainty and increase the risk of inefficient operations.

According to NERA:⁹

Assuming a high level of productivity growth does not increase incentives for efficient operation. Indeed, in extreme cases, setting a productivity assumption that was too high could result in a company spending an inefficiently low amount on opex: Where a regulator sets an allowance at such a level that it threatens the ongoing viability of a business, the operator may not be able or willing to raise the necessary finance for investment or maintenance of its plant and equipment.

As amongst the most efficient distributors in Australia, we do not have the capacity to absorb an excessive productivity adjustment without receiving funding through more step changes and pass throughs. The future of the distribution sector is in transition, and we are already seeing evidence of increases DER-related costs. As more new technologies connect to the network, we must have sufficient funding to absorb those costs *and* continue to meet our obligations and deliver services customers want and need. Alternatively, we may be incentivised to operate the network inefficiently, resulting in higher long-term costs to customers.

⁹ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. 17.

4 Measuring shifts in the productivity frontier

The AER currently uses long-term econometric modelling and long-term MPFP analysis to estimate the trend in productivity. The AER has proposed to change this approach as it believes the 2006–2012 past performance in the electricity sector is not replicable in the future.

In this section we assess the appropriateness of the AER's approach and assess the AER's proposed options and recommendation against the criteria developed by NERA. Where the AER's proposed option does not meet the necessary criteria, we propose an alternative approach.

We only provide select summary points from the NERA report in our submission. However, we support all assessments and conclusions in the full NERA report.

4.1 There is no evidence the 2006–2012 period should be removed

In its draft decision the AER discredited the use of the productivity results for the 2006–2012 period stating:¹⁰

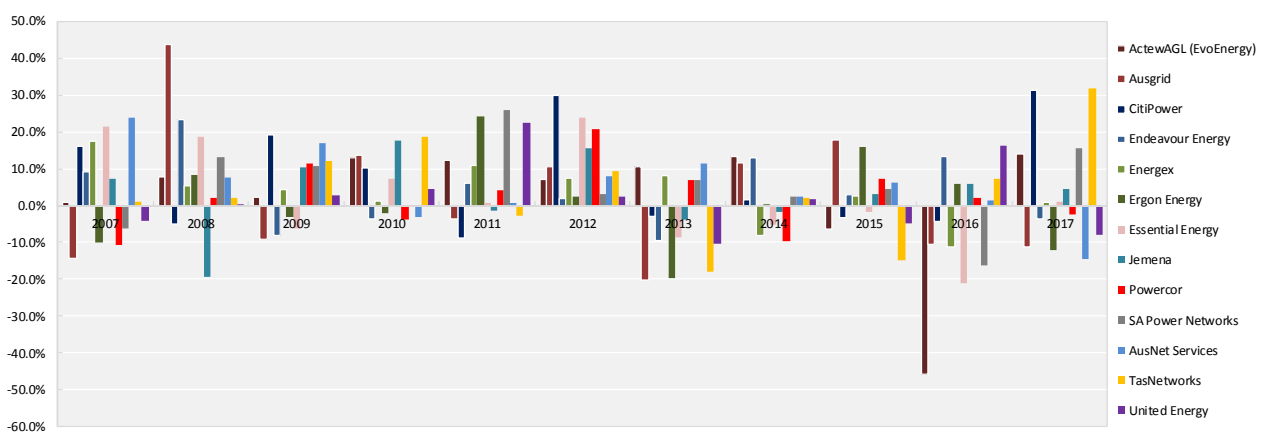
we have not been satisfied that the negative productivity growth we were seeing reflected business as usual circumstances. During this time new regulatory obligations were introduced that significantly increased costs.

However, the AER has not provided any evidence of either the regulatory obligations it is referring to or the significant increase in cost. It is also unclear from the draft decision if the AER is referring to new regulatory obligations in specific jurisdictions or across the NEM.

Figure 1 indicates the change in real operating expenditure of each distributor since 2006. As the figure shows, there is no specific period of growing expenditure for either a single distributor or a single jurisdiction. The only evident outliers are the large increase in expenditure by Ausgrid in 2007 and the large decrease in expenditure by EvoEnergy in 2016.

We therefore question the AER's conclusion the 2006–2012 period is exceptional. Without further evidence of the regulatory obligations and resulting increase in expenditure, we disagree the 2006–2012 period can validly be removed from the data sample.

Figure 1 Changes in real annual operating expenditure for Australian distributors, 2007-2017



Source: AER, AER 2018 distribution partial performance indicators (Excel file).

¹⁰ AER, Draft decision paper, Forecasting productivity growth for electricity distributors, November 2018, p. 5.

4.2 Criteria for setting a target on productivity frontier shifts

The forecast productivity of operating expenditure is intended to capture productivity improvements an efficient operator is able to achieve in providing distribution services—the expected shift in the productivity frontier.

NERA have developed a criteria to which the AER's measured productivity should adhere for distributors to have a reasonable prospect of recovering their expected efficient costs.

1. **Captures trends in productivity for electricity distributors:** a pre-emptive productivity adjustment must reflect the productivity improvement that would be attainable by an efficient distributor.
2. **Separation of catch-up:** a pre-emptive productivity adjustment must not reflect efficiency improvements amongst inefficient distributors as they catch up to the frontier.
3. **Objective and stable approach over time:** the AER's approach should not be highly sensitive to start and end years and should demonstrate longer term productivity trends. Its approach should also be credible such that it can continue to use the approach in subsequent price control periods. Changing approaches frequently will risk perceptions of cherry-picking and could systematically deny cost recovery over time.
4. **Maintenance of incentives for cost reduction:** the AER should not introduce perverse incentives which would encourage distributors to make business decisions with a view to influencing their current or future productivity targets.

Figure 2 on the next page summarises results of NERA's assessment of AER's proposed approaches and alternative approaches against the NERA criteria. The following sections provide a brief summary of the assessment of each option.

While the AER does not have a criteria for measuring productivity, it expresses a preference for two approaches in its draft decision and Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution:

- consistency in the parameters used for productivity, output and price growth forecasts
- an industry-wide measure.

4.2.1 CPI is adjusted for productivity

Additional to the NERA criteria and AER preferences, the AER should ensure there is no 'double-counting' in its forecast productivity measure by adjusting for economy-wide productivity already accounted for in the consumer price index (CPI). The AER uses the assumed rate of inflation in setting revenue allowances. Given operating expenditure is a significant share of the revenue building block, there is potential the AER will overstate an achievable productivity adjustment by not controlling for the difference between the economy-wide productivity adjustment and the frontier shift in the electricity sector.

4.3 Productivity should be measured over the longest possible period

Measured productivity in the electricity distribution sector, much like any other sector in the economy, is cyclical. While changes in operating expenditure are not as cyclical as in lumpy capital expenditure, there are some cyclical changes to inputs (e.g. cycles of inspections and maintenance) and cyclical changes to outputs which are often linked to economic cycles. Measured productivity can also experience outliers driven by sudden changes in either outputs (e.g. a closure of a large factory) or inputs (e.g. extreme weather event).

Figure 2 Summary of the assessment of AER and NERA approaches against the NERA criteria

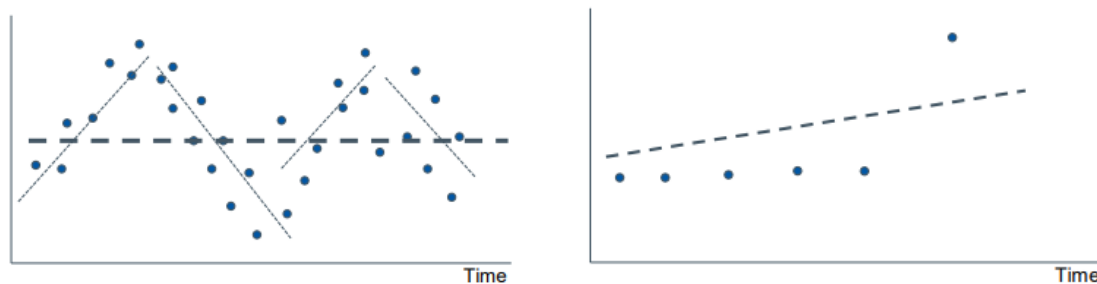
		NERA Approaches			
		Option A: Undergrounding with a DNSP-specific levels coefficient (2006-17 data)	Option B: SFA Trend (2006-17 data)	Option C: SFA Time Trend (2012-17 data)	Option D: Long-term MPFP (2006-17 data)
Applied rate-of-change (% p.a.)		0.06% - 0.29% (0.14% avg)	-1.9%	-1.5%	-1.0%
Approach captures the trend in productivity	Option 1: The status quo (economic approach bound by 0) Option 2: Productivity growth from undergrounding trend Option 3: Undergrounding productivity plus the gas distribution time Option 4: Using industry average opex MPFP growth Option 5: Using forecast labour productivity growth	0% 0.5% 1.0% 1.6% 0.9%	Green Red Red Red N/A	Arbitrary choice of window means approach does not identify long-term productivity changes. Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.	Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.
Approach separates productivity from catch-up	Option 1: The status quo (economic approach bound by 0) Option 2: Productivity growth from undergrounding trend Option 3: Undergrounding productivity plus the gas distribution time Option 4: Using industry average opex MPFP growth Option 5: Using forecast labour productivity growth	0% 0.5% 1.0% 1.6% 0.9%	Green Green Red Red N/A	Arbitrary choice of window means approach does not identify long-term productivity changes. Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.	Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.
Approach is objective and stable over time	Option 1: The status quo (economic approach bound by 0) Option 2: Productivity growth from undergrounding trend Option 3: Undergrounding productivity plus the gas distribution time Option 4: Using industry average opex MPFP growth Option 5: Using forecast labour productivity growth	0% 0.5% 1.0% 1.6% 0.9%	Green Green Red Red N/A	Arbitrary choice of window means approach does not identify long-term productivity changes. Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.	Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.
Approach does not limit incentives to reduce costs	Option 1: The status quo (economic approach bound by 0) Option 2: Productivity growth from undergrounding trend Option 3: Undergrounding productivity plus the gas distribution time Option 4: Using industry average opex MPFP growth Option 5: Using forecast labour productivity growth	0% 0.5% 1.0% 1.6% 0.9%	Green Green Red Red N/A	Arbitrary choice of window means approach does not identify long-term productivity changes. Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.	Assuming 2006-17 is relevant on an ongoing basis, this approach precisely captures ongoing productivity for DNSPs. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Coefficient based on SFA model, which explicitly aims to estimate the efficient frontier. Internally consistent with other parts of the efficiency assessment, and objectively uses all available data. Internally consistent with other parts of the efficiency assessment, but requires arbitrary selection of start year.
Overall Assessment			Green Green Red Red N/A	Green Green Red Red N/A	Green Green Red Red N/A

Note: Green = approach satisfies criterion in practice and in theory; amber = approach may violate criterion in theory, but may not be a problem in practice; red = approach violates criterion in theory and in practice.

Source: NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. vi.

Figure 3 indicates the dangers in using short-term periods to measure productivity, particularly if the short-term includes cycles and outliers.

Figure 3 Differences in measuring short-term and long-term trends with cycles and outliers



Source: NERA, *Economic considerations for forecasting productivity*, presentation at AER forum on forecasting productivity, 30 November 2018, p. 4.

The use of long-term econometric modelling meets all of the NERA criteria, while long-term MPFP meets most of the criteria. Long-term modelling smooths cycles and reduces the impact of outliers in larger samples. It also removes the need for forensic assessment of individual distributors' expenditure to remove one-offs and catch-up as it smooths for effects of each distributor's catch-up over time. In its Better Regulation Explanatory Statement Expenditure Forecast Assessment Guideline for Electricity Distribution, the AER provides evidence of the use of long-term modelling reducing the impact on catch-up on the long-term trend in the gas sector.¹¹

Importantly, use of long-term modelling provides stability and predictability in regulatory decision making, reducing regulatory risk and lowering long-term costs to consumers.

According to NERA, regulators internationally use long-term modelling to avoid the dangers of catch-up and one-offs:¹²

- North American regulators typically rely on a broad dataset since 1973 for electricity distributors (or gas distributors in the gas sector) from across the United States
- in the United Kingdom, Ofgem uses data from 1970 to 2007 from a collection of industries identified as relevant for the entire period—Ofgem does not rely on data from electricity, gas and water as those datasets include catch-up
- in the Netherlands, the Dutch regulator Authority of Consumers and Markets selects two complete business cycles from the same long-term dataset that Ofgem uses.

Houston Kemp, in its report for Victorian distributors and SA Power Networks, also notes:¹³

A further reason for taking a long-term view is that in many cases the net effect of productivity enhancing activities can only be assessed over an extended horizon. In particular, the full benefit of

¹¹ AER, *Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 103.

¹² NERA Economic Consulting (2018), *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. 14.

¹³ Houston Kemp, *Pre-emptive productivity adjustments*, prepared for Jemena, AusNet Services, SA Power Networks, CitiPower, Powercor Australia and United Energy, 8 May 2018, p. 15.

efficiency enhancing activities may only be realised years into the future and may be preceded by a degradation of productivity in the short-term.

Examples include the cost and time required to train staff in new systems or processes, resulting in initial increase in cost with lagged efficiency improvements.

4.4 Operating expenditure MPFP is not reliable for setting frontier shift targets

While the operating expenditure MPFP measure meets the AER preference of consistency in parameters used and providing an industry-wide measure, it is not reliable for measuring shifts in productivity frontier.

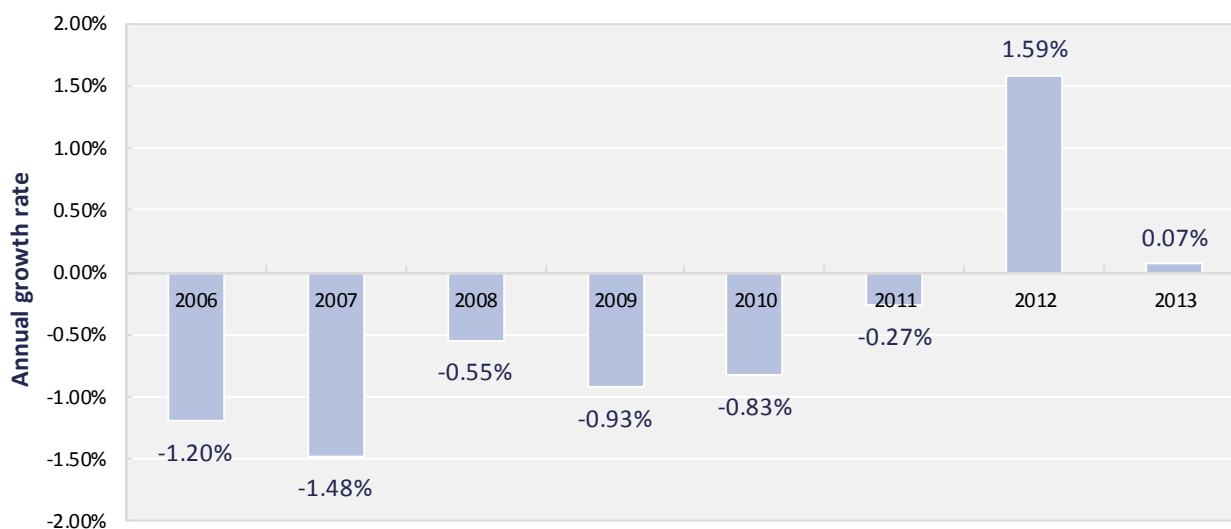
As Figure 2 shows, operating expenditure MPFP measure does not satisfy any of the criteria for setting a target for the productivity frontier shift.

Additionally, the specific data window chosen by the AER and the choice of controls for removal of catch-up appears biased.

As Figure 3 shows, the AER has chosen the start year as 2012—the only year that results in material increase in productivity compared to 2016. Coincidentally, as Figure 1 shows, in 2012 our operating expenditure experienced an unusually high increase due to higher than usual vegetation management activities and due to an increase in lines maintenance resulting from a directive from ESV. As such, any comparison to 2012 would not be a true reflection of our average annual productivity performance.

The AER has also attempted to control for catch-up by removing four distributors from the sample that were deemed materially inefficient in 2014. The AER did not however remove numerous other one-off events and evidence of catch-up from the sample, as well as changes in capitalisation policies which reduce operating expenditure but do not reflect any savings.

Figure 4 Industry MPFP for different averaging periods; AER approach option 4



Source: NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. ii.

Structural one-offs that were not excluded from the sample include:

- Endeavour Energy's privatisations
- amalgamation of TasNetworks transmission and distribution operations
- merger of CitiPower and Powercor with United Energy.

We also consider our 'World Class' initiative in efficiency improvement undertaken in 2015 by CitiPower and Powercor to have included a series of one-off savings that are not replicable in the near future. These include:

- aggressive renegotiation of large external contracts, including vegetation management, local service provider arrangements and IT service providers
- downsizing of corporate functions
- insourcing of a number of services previously provided externally.

To completely remove catch-up and one-offs that are not replicable in the near future by all efficient networks, the AER would have to conduct a forensic analysis of distributors' historical operating expenditure. It is not sufficient to exclude a number of distributors who were previously deemed inefficient. Further, it is unclear what judgment the AER will use to remove catch-up from the sample for the final decision, as there were no distributors in the NEM deemed to be materially inefficient in 2018.

For a complete analysis of the AER proposed MPFP approach refer to Chapter 6 of the NERA report.

4.5 Econometric modelling is the most appropriate for measuring productivity frontier shifts

Econometric modelling uses the same parameters used in output growth and input price forecasting and it measures, among other outputs, the time trend or the change in productivity not attributable to controlled variables. According to the AER these can be technological change, changes in processes or regulatory obligations. NERA adds that in principle, the time trend would also measure changes in other unaccounted for variables such as outputs not measured in the current framework, e.g. safety, network security and providing access to customers to export energy.

As Figure 2 shows, the long-term Cobb-Douglas stochastic frontier analysis (**SFA**) modelling meets all of NERA's criteria for appropriate forecasting of frontier productivity shifts. The model is designed for estimating the efficient frontier, and it removes the need for subjective forensic assessments of individual distributors to determine one-offs and catch-up. Importantly, the model improves over time with additional data, providing a stable and predictable method to estimating productivity over time. Further, as data from all distributors is used over a longest possible period, there is low impact on efficiency incentives.

The time trend for electricity distribution from 2006–2017 and from 2012–2017 is negative, indicating declining industry productivity. The AER however believes the negative trend during the 2012–2017 period is due to a negative trend in the international data set used in AER's modelling, which is necessary in the modelling for data.

As indicated above, we do not believe there is enough evidence to remove the 2006–2012 period from the sample and the priority should be long-term modelling. However, if the AER believes the international data set is distorting results for the Australian electricity distribution sector, even in the long-term analysis, the AER in the first place provide evidence this is the case and if so, it should consider alternative methods to improving the reliability of the data, including but not limited to:

- creating dummy variables to control for international data
- finding alternative international data that is more similar to the Australian industry.

The SFA approach to estimating efficiency frontier is the most reliable and stable approach to forecasting productivity and the AER's focus should be on improving the model over time to best capture long-term productivity trends, rather than discrediting its outputs and relying on inferior models.

4.6 Undergrounding measure should be firm-specific

Undergrounding assets is likely to deliver operating expenditure efficiencies however the extent of savings from undergrounding will depend on its size, location and environmental factors surrounding the asset. This is reflected in distributors having a wide variety of percentage of assets underground.

Despite the operating expenditure savings, undergrounding is an expensive undertaking and is only carried out through a directive irrespective of cost or when the benefits outweigh the costs. Based on these conditions, distributors have different needs and opportunities to underground assets, with each distributor having a firm-specific efficient rate of undergrounding.

According to NERA, the AER's proposed undergrounding measure uses the same parameters used in output growth and input price forecasts.¹⁴ However, the AER measures the undergrounding share in logarithmic terms, which implies that companies with a larger share of assets underground will increase their undergrounding share at a higher rate than those with a lower share and that all distributors will accelerate undergrounding over the following regulatory period. Neither implication reflects the decisions that an efficient or prudent operator would make.

NERA recommend two changes to the AER's approach:

- each distributors efficiency target should be based on its own assumed rate of undergrounding rather than the industry-average
- the operating expenditure saving should be calculated using a linear, rather than logarithmic, approach.

Under NERA's proposed alternative, distributors are assumed to carry out undergrounding in line with historical levels and operating expenditure savings are measured using intuitive cost relationships.¹⁵

The AER also uses the SFA model and the least squares estimation (**LSE**) models for estimate productivity form undergrounding. NERA notes it may be most appropriate to rely exclusively on the SFA model as the SFA model estimates the frontier relationship between inputs and outputs while the LSE models estimate the relationship between inputs and outputs across all firms, including those which are inefficient.

For a complete analysis of the AER proposed approach using undergrounding refer to Chapter 4 of the NERA report.

4.7 Using gas distribution productivity measures is not appropriate

Using the gas distribution sector to forecast productivity in the electricity sector does not meet the AER preference to use the same inputs and output as in other operating expenditure forecasting for the electricity distribution sector. It is also unnecessary as existing electricity data is sufficient for estimating productivity in the sector.

Figure 2 shows using the gas distribution sector to forecast productivity in the electricity distribution sector does not meet the NERA criteria for the following key reasons:¹⁶

¹⁴ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. 24–25.

¹⁵ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p. 51.

¹⁶ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p.30.

- electricity and gas industries may not be able to achieve the same technological improvements as they face fundamentally different cost inputs and conditions
- many of the coefficients in the gas modelling are not statistically significant and may appear to demonstrate productivity improvements in the gas sector only by chance
- the AER may double-count genuine productivity improvements by combining the gas productivity forecast with an undergrounding coefficient from electricity-specific models.

For a complete analysis of the AER proposed approach using the gas distribution sector refer to Chapter 5 of the NERA report.

4.8 Using labour productivity measure is not appropriate

Using the labour productivity measure to forecast productivity in the electricity sector does not meet the AER preference to use the same inputs and output as in other operating expenditure forecasting for the electricity distribution sector. Also, Figure 2 shows using a labour productivity measure to forecast productivity in the electricity distribution sector does not meet the NERA criteria for the following key reasons:¹⁷

- it may be primarily reliant on economy-wide productivity growth as a proxy for utilities labour productivity growth (it is unclear what weights DAE modelling puts on the economy-wide figure). Economy-wide and utilities labour growth rates have not been similar historically and should not be directly comparable
- it assumes distributors would be able to achieve the same productivity gains on outsourced labour and internal labour
- improved labour productivity may be offset by worsening productivity in other inputs which are not considered.

This measure was particularly difficult to assess given the lack of clarity of approach taken by DEA in forecasting labour productivity.

For a complete analysis of the AER proposed approach using the gas distribution sector refer to Chapter 7 of the NERA report.

¹⁷ NERA Economic Consulting, *Assessment of the AER's Proposed Productivity Assumptions*, prepared for CitiPower, Powercor, SA Power Networks and United Energy, 20 December 2018, p.49.

5 Recommendation

The AER has an obligation to reduce forecasting error as much as possible to ensure pre-emptive productivity adjustments are achievable by all distributors. By selecting an excessive productivity adjustment that fails to appropriately remunerate efficient distributors, the AER is increasing regulatory risk and effectively passing the risk onto consumers.

In this section we recommend an approach to forecasting productivity that meets the NERA criteria and provides the most reasonable prospect of allowing distributors to recover at least their efficient cost.

5.1 Econometric modelling over the longest term possible

We recommend the AER continue to use econometric modelling over the longest term possible to forecast productivity frontier shifts. This is the 'status quo' option in the draft decision and there is no economic reason for the AER to depart from that approach.

The AER has not provided evidence the 2006–2012 period is exceptionally different to warrant exclusion from the data set. NERA's assessment also shows all AER proposed options are inferior to the status quo, when measured against the NERA criteria and the AER's preference of consistency and industry-wide measures.

Econometric modelling over the long-term provides stability and predictability in the regulatory framework, which is a key criterion for lowering regulatory risk and reducing costs over time.

Therefore, it is in the long-term interest to consumers that the AER does not abandon a statistically viable, stable measure of productivity frontier shifts in favour of inferior subjective measures that allow opportunistic claw back in the short-term but lead to instability in the framework and higher regulatory risk.

5.2 There should be stability in the method, not the measure

Econometric modelling improves over time with the inclusion of more data points. We therefore recommend the AER keeps applying the same econometric method to each regulatory decision, but the model should be updated with the most available data at the time of the decision.