

Final report

Reliability standards for Energex and Ergon Energy for the 2020–25 period

June 2019

© Queensland Competition Authority 2019

The Queensland Competition Authority supports and encourages the dissemination and exchange of information. However, copyright protects this document.

The Queensland Competition Authority has no objection to this material being reproduced, made available online or electronically but only if it is recognised as the owner of the copyright and this material remains unaltered.

Contents

EXECUTIVE SUMMARY	ii
1 OVERVIEW OF NETWORK RELIABILITY ARRANGEMENTS	1
1.1 Network reliability arrangements in Queensland	1
1.2 Broader regulatory context	2
2 SETTING MINIMUM SERVICE STANDARDS FOR 2020–25	4
2.1 Overview	4
2.2 Establishing MSS limits for 2020–25	6
2.3 Definitions and exclusions	19
3 WORST PERFORMING FEEDERS	21
3.1 Overview	21
3.2 Proposed amendments to worst performing feeder provisions	22
3.3 QCA analysis and conclusions	23
4 SERVICE SAFETY NET TARGETS	27
4.1 Overview	27
4.2 Proposed amendments to the service safety net target provisions	29
4.3 QCA analysis and conclusions	31
5 EFFECTIVENESS OF THE NETWORK RELIABILITY FRAMEWORK	35
5.1 Effectiveness of the MSS	35
5.2 Network reliability arrangements and the STPIS	38
5.3 QCA conclusions	41
GLOSSARY	42
APPENDIX A : MINISTERIAL DIRECTION	44
APPENDIX B : SUBMISSION LIST	46
APPENDIX C : RECOMMENDED DEFINITIONS AND EXCLUSIONS FOR MSS	47
APPENDIX D : ASSESSMENT OF DEFINITIONS AND EXCLUSIONS FOR SAIFI AND SAIDI	49
APPENDIX E : RECOMMENDED WPF PROVISIONS	66
APPENDIX F : RECOMMENDED SAFETY NET PROVISIONS	68
APPENDIX G: JURISDICTIONAL COMPARISONS	71
Worst performing feeders	71
Network security planning criteria	74
Recent reliability reviews	76

EXECUTIVE SUMMARY

On 30 January 2019, the Minister for Natural Resources, Mines and Energy (the Minister) directed the Queensland Competition Authority (QCA) under section 253AA of the *Electricity Act 1994* to provide a written report setting out recommended reliability standards for Energex and Ergon Energy NEM connected networks, and for Ergon Energy's Mt Isa–Cloncurry network, for the period 1 July 2020 until 30 June 2025. A copy of the Minister's direction notice is provided at Appendix A.

This final report presents the QCA's findings and recommendations, taking into account stakeholder submissions in response to our discussion paper and draft report, and other information received to date.

Queensland's network reliability arrangements apply to Energy Queensland's Energex and Ergon Energy businesses, and entail a number of core components:

- the minimum service standards (MSS) limits that set minimum standards for the frequency and duration of electricity supply interruptions
- the service safety net targets that guide network planning and investment to minimise the effects of high impact, low probability network asset failures
- 'worst performing feeder' improvement programs, which ensure that reliability in the worst performing parts of the distribution network is actively monitored and improved, where possible.

The QCA recommends that the MSS limits should be held at their current levels for the 2020–25 period. Relevantly, stakeholder submissions highlighted the desire to avoid increasing electricity prices. This is consistent with the findings of recent customer research, which indicates that Queensland electricity consumers are largely satisfied with their current levels of reliability and are unwilling to either pay more for improvements or accept any deterioration in reliability.

The QCA considers that customer satisfaction with current reliability and willingness to pay for, or accept, a different level of reliability are threshold matters. Only if it can be established that there is an appetite for improved reliability, and a willingness to pay for it, do we consider it necessary to contemplate increasing reliability standards.

Maintaining minimum reliability levels as currently specified will encourage Energex and Ergon Energy to deliver the same level of reliability experienced by customers, with no material change in costs borne by customers. The QCA notes that Energex and Ergon Energy have made significant improvements in reliability since the inception of MSS limits and have demonstrated consistently reliable performance in recent years, for most network feeder types.

While we recommend no change in the absolute value of the MSS limits, there are opportunities to reduce compliance and reporting burdens by aligning particular MSS definitions and exclusions with those of the Australian Energy Regulator's Service Target Performance Incentive Scheme (STPIS). Importantly, these changes will not lead to a deterioration in the reliability performance that customers experience, as they only change the way in which reliability performance is characterised and reported.

The QCA has examined the distribution authority provisions relating to worst performing feeders and service safety net targets. Energy Queensland suggested a range of amendments intended to align the requirements applying to both its Energex and Ergon Energy businesses. Energy Queensland's goal in aligning these provisions is to realise opportunities for more efficient and integrated network planning and reporting across the two businesses.

We consider that the worst performing feeder provisions should be aligned to apply consistently across both Energex and Ergon Energy. The criteria that Energy Queensland proposed are largely reasonable and we consider it appropriate to adopt them, subject to some amendments.

Energy Queensland's proposed amendments to the service safety net provisions appear generally reasonable and we recommend that most of the proposed changes be adopted, with some exceptions. Considerable scope remains for further reform of the safety net provisions, and we recommend these matters be revisited in advance of the 2025–30 regulatory period. We note that Energex and Ergon Energy have signalled the need for more significant reform of the safety net provisions in future, to achieve closer alignment between the two networks.

We have considered the effectiveness of the MSS framework as a mechanism to achieve network reliability outcomes, as required by the Minister's direction. We consider that the MSS have been effective in delivering improved distribution network reliability. The shift from deterministic to probabilistic network security and planning criteria, and the relaxation of the MSS limits in 2014, have resulted in the focus of the distribution network service providers (DNSPs) shifting from improving to maintaining reliability, thereby alleviating costs pressures on consumers.

In our view, Queensland's network reliability arrangements, including the MSS limits, are a substantive component of the regulatory framework and serve a purpose that is not achieved by the STPIS alone. Nonetheless, we consider there is scope to reduce the compliance burden of maintaining two reliability frameworks by more closely aligning the data requirements of the MSS with the STPIS.

1 OVERVIEW OF NETWORK RELIABILITY ARRANGEMENTS

Queensland's network reliability arrangements include minimum service standards, network security planning criteria ('service safety net target' provisions), and obligations to improve reliability of the worst performing feeders.¹

The QCA has also considered the broader regulatory context, including the extent to which Queensland's network reliability arrangements interface with the AER's responsibilities and consistency with the National Electricity Network Reliability Principles.

1.1 Network reliability arrangements in Queensland

1.1.1 Minimum service standards (MSS) limits

The minimum service standards are network reliability standards that establish limits for the duration and frequency of distribution network outages. They include two measures of reliability, which capture the average duration and frequency of customer interruptions over time.

The duration of outages is measured by the System Average Interruption Duration Index (SAIDI). This is a measure of how long each customer is without supply for the period (e.g. a year) when averaged over all customers on the network. SAIDI is expressed as the total duration of all customer interruptions divided by the total number of customers, recorded for each feeder type.

The frequency of outages is measured by the System Average Interruption Frequency Index (SAIFI). This is a measure of the average number of supply interruptions that each customer experiences for the period. SAIFI is expressed as the total number of all customer interruptions divided by the total number of customers, recorded for each feeder type.

The MSS limits are specific to network 'feeder types', reflecting different performance standards that should be achievable across different parts of the distribution network service providers (DNSPs') networks. Energex's network is split into CBD, urban and short rural feeder types, while Ergon Energy's network is split into urban, short rural and long rural feeder types.

Energex and Ergon Energy's distribution authorities prescribe the SAIDI and SAIFI limits for each feeder type. SAIDI and SAIFI limits for Energex are more stringent than those for Ergon Energy, reflecting the differences in their network characteristics and operating environments.

Not all customer interruptions are included when determining whether a DNSP has exceeded the SAIDI or SAIFI limit in any given year. Interruptions caused by certain major events, such as severe storms, are excluded.

The distribution authorities require each DNSP to use all reasonable endeavours to ensure that it does not exceed the applicable SAIDI and SAIFI limits in a financial year. Exceedance of the same limit for three years in a row is considered a 'systemic failure' and constitutes a breach of the distribution authority.

1.1.2 Worst performing feeder (WPF) improvement programs

The SAIDI and SAIFI MSS limits are targeted at ensuring the DNSPs deliver acceptable average reliability performance across feeder types. However, targeting and reporting reliability

¹ Distribution authorities also include obligations to meet guaranteed service levels (GSLs). The QCA recently completed a review of these obligations under a separate process.

performance in this way masks the fact that some feeders perform much better than average and others perform much worse.

To address this issue, the distribution authorities require Energex and Ergon Energy to monitor and report on their WPFs, and to implement programs to improve their reliability performance. The stated purpose of the worst performing feeder improvement obligations is to enable customers with the worst reliability outcomes to benefit from tailored network improvements.

1.1.3 Service safety net targets

The distribution authorities each include 'service safety net target' obligations, which seek to mitigate the risk of 'low probability, high consequence' network outages to avoid unexpected customer hardship and/or significant community or economic disruption. Each DNSP is obliged to design, plan and operate its network to ensure, to the extent reasonably practicable, that it achieves the safety net targets prescribed in its distribution authority.

1.2 Broader regulatory context

1.2.1 Interface with AER processes

Since 1 July 2010, the Australian Energy Regulator (AER) has been responsible for the economic regulation of Energex and Ergon Energy's distribution networks, under the National Electricity Rules (NER).

The AER makes revenue determinations for Energex and Ergon Energy based on the efficient costs each DNSP is expected to incur in providing regulated distribution services over the regulatory period. These determinations also include the application of the AER's Service Target Performance Incentive Scheme (STPIS), which provides financial incentives for the DNSPs to maintain and improve service performance.

The AER's revenue determination process for Energex and Ergon Energy for the 2020–2025 regulatory period commenced with Energex and Ergon Energy submitting regulatory proposals to the AER on 31 January 2019.

While Queensland's network reliability arrangements are distinct from the STPIS and the AER's regulatory role, the costs necessary for a DNSP to meet the network reliability arrangements prescribed in the distribution authorities are relevant for the AER's revenue determination.

1.2.2 National Electricity Network Reliability Principles

In the development of this report, the QCA has given regard to the National Electricity Network Reliability Principles that were endorsed by the Council of Australian Governments (COAG) Energy Council in December 2014 to guide a national approach to the setting of reliability standards² (see Box 1 below).

² Council of Australian Governments (COAG) Energy Council, *Response to the Australian Energy Market Commission's Review of the National Framework for Distribution Reliability and Review of the National Framework for Transmission Reliability*, December 2014.

Box 1 – National Electricity Network Reliability Principles

- Reliability should be managed in a manner that delivers a level of reliability that is consistent with consumers preferences assessed in terms of the value customers place on reliability.
- The process of managing reliability should be cost effective; that is, it should achieve the desired outcomes through a process that imposes the least additional cost on consumers.
- The process for setting reliability requirements should be transparent and public with the assessment and considerations used in setting reliability published.
- The existing Service Target Performance Incentive Scheme (STPIS) should be continued to encourage distribution businesses to efficiently perform to the level of their reliability requirements and should be set reflecting consumer preferences in terms of the value customers place on reliability.
- The management of reliability outcomes should be effectively integrated with the economic regulatory decision making processes of the AER (and, where a jurisdiction adopts the Declared Transmission System planning functions – with the planning processes of AEMO).

In addition, the COAG Energy Council endorsed the following minimum requirements for reliability to support the National Electricity Network Reliability Principles:

- Distribution reliability requirements should:
 - (a) be in the form of output performance targets (i.e. limits) for outages;
 - (b) be expressed, as a minimum, in terms of duration and frequency of unplanned outages, and defined according to common definitions across the NEM; and
 - (c) reliability requirements should be set (or approved) by a party that is independent of the network business.
- Network businesses should continue existing annual reporting on reliability performance and commission five-yearly independent audits of planning, systems and procedures to meet reliability standards.
- The AER should report on businesses' reliability performance annually in existing benchmarking reports.

Source: COAG Energy Council, Response to AEMC Review of the National Framework for Distribution Reliability and Review of the National Framework for Transmission Reliability, 2014, pp. 5–6.

2 SETTING MINIMUM SERVICE STANDARDS FOR 2020–25

The QCA recommends that the minimum service standards (MSS) limits for Energex and Ergon Energy should remain at their current levels for the 2020–25 period. Stakeholder submissions highlighted the desire to avoid increasing electricity prices. This is consistent with the findings of recent customer research, which indicates that Queensland electricity consumers are largely satisfied with their current levels of reliability, and are unwilling to either pay more for improvements or accept any deterioration in reliability.

Maintaining the MSS limits at their current levels will encourage the DNSPs to deliver the same level of reliability experienced by customers, with no material change in costs borne by customers. The QCA notes that the DNSPs have made significant improvements in reliability since the inception of the MSS limits and have demonstrated consistently reliable performance in recent years for most feeder categories.

While we recommend no change in the absolute value of the MSS limits, there are opportunities to reduce compliance and reporting burdens, by aligning the MSS definitions and exclusions with those of the STPIS. Importantly, these changes will not lead to a deterioration in the reliability performance that customers experience, as they only change the way in which reliability performance is characterised and reported.

2.1 Overview

The MSS were implemented in 2005, along with the first version of the Electricity Industry Code, in response to recommendations made by the Electricity Distribution and Service Delivery (EDSD) review panel.³ The EDSD review was initiated by the Queensland Government following extended network outages due to storms and extreme heat in early 2004. The EDSD review panel made a number of recommendations to address reliability problems in the Queensland networks, including establishing network security planning standards and MSS limits.

The first MSS limits required Energex and Ergon Energy to achieve incremental improvements in network reliability over time.

QCA review of MSS, 2009

In accordance with the Electricity Industry Code, the QCA first reviewed the MSS and reset the initial post-EDSD limits in April 2009. The QCA's 2009 decision required less improvement in reliability during the 2010–15 period than was envisaged by the indicative post-EDSD MSS limits. The QCA concluded that this was appropriate at that time, based on the level of reliability that customers were willing to pay for, and the actual reliability performance of the network businesses.

Electricity Network Capital Program (ENCAP) Review, 2011

In 2010, the Queensland Government ordered a review into the expenditures of Energex and Ergon Energy, which included an examination of whether the incremental reliability

³ Independent Panel of the Electricity Distribution and Service Delivery (EDSD) Review, *Electricity distribution and service delivery for the 21st century*, July 2004.

improvements set by the QCA in 2009 were still necessary, or whether the networks could be considered reliable.⁴

The ENCAP review panel found that significant capital expenditure savings could be realised by relaxing the network planning criteria and the MSS limits, which would reduce pressure on electricity prices. The panel recommended that Energex's MSS limits be 'flat-lined' at 2011–12 levels and held constant until 30 June 2015.

The ENCAP review panel also examined Ergon Energy's performance against the MSS limits and concluded that there was still a need for further investment to improve its reliability performance, particularly on urban feeders. On this basis, no changes to the MSS limits for Ergon Energy were recommended. However, the panel noted that if Ergon Energy committed further planned investment and showed that it could consistently meet its MSS limits, there could be potential for the limits to be flat-lined at 2014–15 levels at the time of the next review.⁵

QCA review of MSS, 2014

In August 2013, the QCA commenced a review of the MSS arrangements to apply for the 2015–20 period. The QCA released a draft decision in March 2014, recommending that the MSS limits for both DNSPs be held flat at their 2014–15 levels for the 2015–20 period.

In April 2014, the Queensland Government advised the QCA that it had decided to implement two recommendations of the Independent Review Panel on Network Costs (IRPNC)⁶ by 1 July 2014 relating to the MSS limits, namely that:

- (a) MSS be removed from the Electricity Industry Code and set into the distribution authorities of the distribution businesses so that systemic failures to achieve the MSS limits would result in a higher penalty;⁷ and
- (b) MSS be set at the levels applying at the start of the regulatory period (at 2010–11 levels), to reduce upward pressure on network costs and retail electricity prices.⁸

At the request of the then Minister, the QCA amended the Electricity Industry Code to remove all MSS-related provisions, including the requirement for the QCA to review MSS arrangements in future.⁹

Distribution authorities

Since 1 July 2014, the MSS have been included in the distribution authorities of Energex and Ergon Energy, alongside the other elements of the network reliability arrangements.¹⁰

⁴ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, November 2011, p. 44.

⁵ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, November 2011, p. 45.

⁶ The IRPNC was engaged by the Queensland Government's Interdepartmental Committee on Electricity Sector Reform to investigate the drivers of network costs and provide recommendations to reduce the impact of network charges on retail electricity prices.

⁷ Independent Review Panel on Network Costs (IRPNC), *Electricity network costs review*, final report, December 2012, p. 43.

⁸ IRPNC, *Electricity network costs review*, final report, December 2012, p. 45.

⁹ However, the then Minister proposed that the QCA may be directed to conduct a review of the MSS where required.

¹⁰ See Queensland Government, *Distribution Authority No. D01/99 issued to Ergon Energy Corporation Limited*, 2014; Queensland Government, *Distribution Authority No. D07/98 issued to Energex Limited*, 2014.

The current annual SAIDI and SAIFI MSS limits for Energex and Ergon Energy, as prescribed in their respective distribution authorities, are set out in the tables below. These limits reflect a freezing of the MSS limits at their 2010–11 levels, consistent with the recommendations of the IRPNC.

Table 2 Energex—current SAIDI limits (minutes per customer)

<i>Feeder type</i>	<i>2014–15</i>	<i>2015–16</i>	<i>2016–17</i>	<i>2017–18</i>	<i>2018–19</i>	<i>2019–20</i>
CBD	15	15	15	15	15	15
Urban	106	106	106	106	106	106
Short rural	218	218	218	218	218	218

Table 3 Energex—current SAIFI limits (interruptions per customer)

<i>Feeder type</i>	<i>2014–15</i>	<i>2015–16</i>	<i>2016–17</i>	<i>2017–18</i>	<i>2018–19</i>	<i>2019–20</i>
CBD	0.15	0.15	0.15	0.15	0.15	0.15
Urban	1.26	1.26	1.26	1.26	1.26	1.26
Short rural	2.46	2.46	2.46	2.46	2.46	2.46

Table 4 Ergon Energy—current SAIDI limits (minutes per customer)

<i>Feeder type</i>	<i>2014–15</i>	<i>2015–16</i>	<i>2016–17</i>	<i>2017–18</i>	<i>2018–19</i>	<i>2019–20</i>
Urban	149	149	149	149	149	149
Short rural	424	424	424	424	424	424
Long rural	964	964	964	964	964	964

Table 5 Ergon Energy—current SAIFI limits (interruptions per customer)

<i>Feeder type</i>	<i>2014–15</i>	<i>2015–16</i>	<i>2016–17</i>	<i>2017–18</i>	<i>2018–19</i>	<i>2019–20</i>
Urban	1.98	1.98	1.98	1.98	1.98	1.98
Short rural	3.95	3.95	3.95	3.95	3.95	3.95
Long rural	7.40	7.40	7.40	7.40	7.40	7.40

2.2 Establishing MSS limits for 2020–25

The level at which the MSS limits are set for the 2020–25 period will have an impact on the level of reliability experienced by customers and the price that customers pay for that reliability. Delivering improvements in reliability typically requires network businesses to incur operating and/or capital costs. These reliability-related expenditures are ultimately recovered through regulated network charges, which are passed on to customers through retail electricity prices.

The QCA is of the view that MSS limits should be amended only if there is a compelling case to do so. Specifically, there should be a clear case that there is a preference for improved reliability and that customers are willing to pay for it.¹¹ Where that can be established, it should also be

¹¹ While the Minister's direction does not require the QCA to examine the implications of relaxing the MSS limits, recent consumer research indicates that customers are not willing to accept a lower level of reliability performance (see section 2.2.2).

demonstrated that the benefits of any improvement in reliability outweigh the costs of delivering that improvement.

In considering whether the MSS limits should be amended for the 2020–25 period, the QCA has had regard to the following matters, as required by the Minister's direction:

- the past reliability performance of Energex and Ergon Energy
- the financial and pricing consequences of changing the reliability standards
- the amount customers are willing to pay to increase reliability above current levels.

These matters are discussed below.

2.2.1 MSS performance of Energex and Ergon Energy

In accordance with their distribution authorities, Energex and Ergon Energy are required to report their performance against the MSS limits to the Queensland Government on a quarterly basis. The MSS performance data allows year-on-year comparisons of the performance of each DNSP over time; however, it is not intended to enable the performance of Energex and Ergon Energy to be directly compared. Energex and Ergon Energy have different network characteristics and operate in very different environments, which affect reliability outcomes.

Energex

Energex's performance against the MSS limits shows improvement in annual SAIFI performance for both urban and short rural feeder types, as demonstrated by a five-year rolling average (Figure 1). While not as significant, this is also the case for SAIDI performance.

Although there is no clear sign of improvement in the reliability of CBD feeder types, Energex has typically achieved SAIDI and SAIFI performance outcomes well within the MSS limits. In particular, Energex has outperformed the SAIDI limits set for CBD feeders by, on average, 76 per cent since 2005–06.

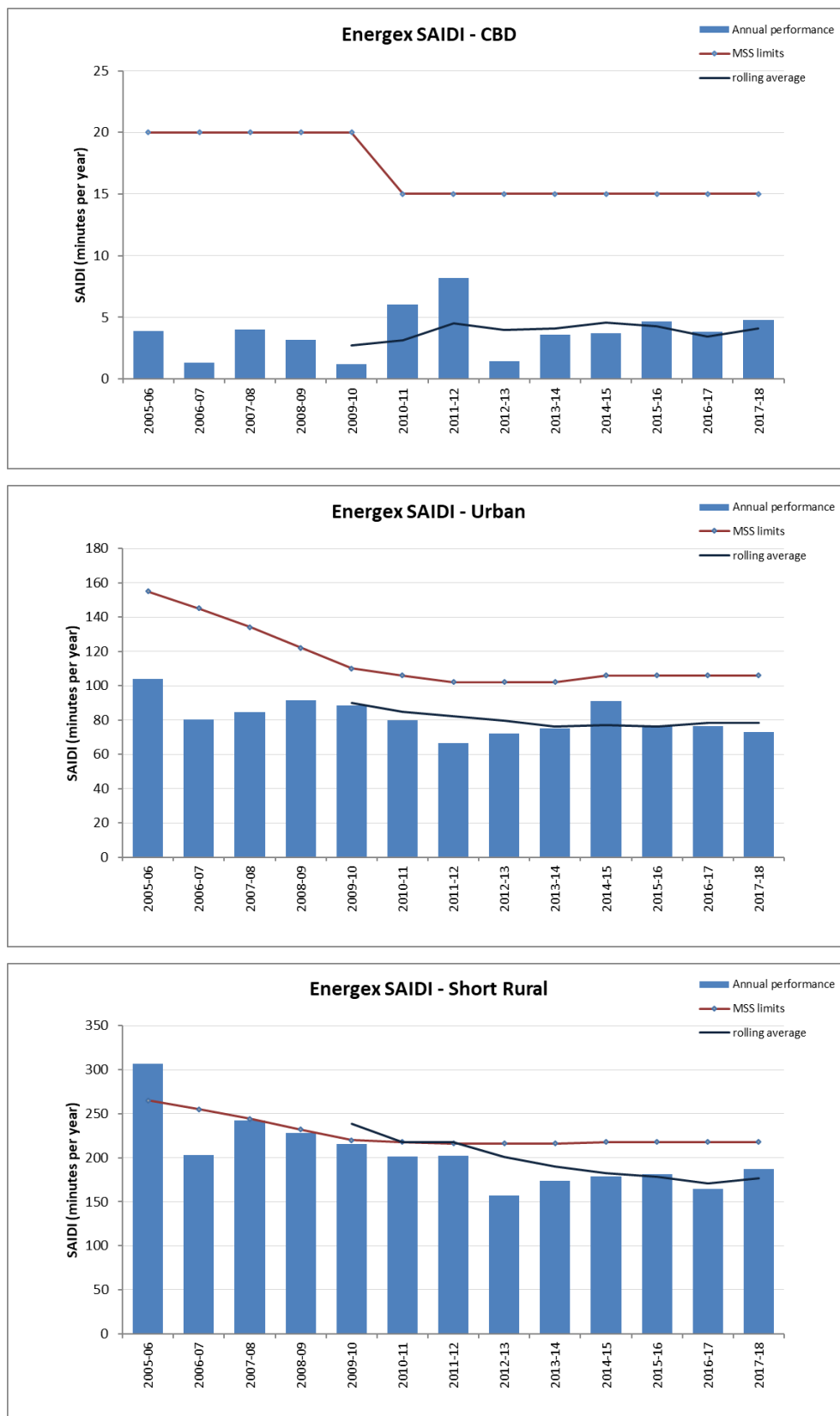
The only breach of an MSS limit for Energex's CBD feeders occurred in 2014–15, when the SAIFI limit was slightly exceeded. Energex attributed this to a significant outage in the Brisbane CBD on 9 March 2015.¹² Annual performance has since returned to levels well within the MSS limits.

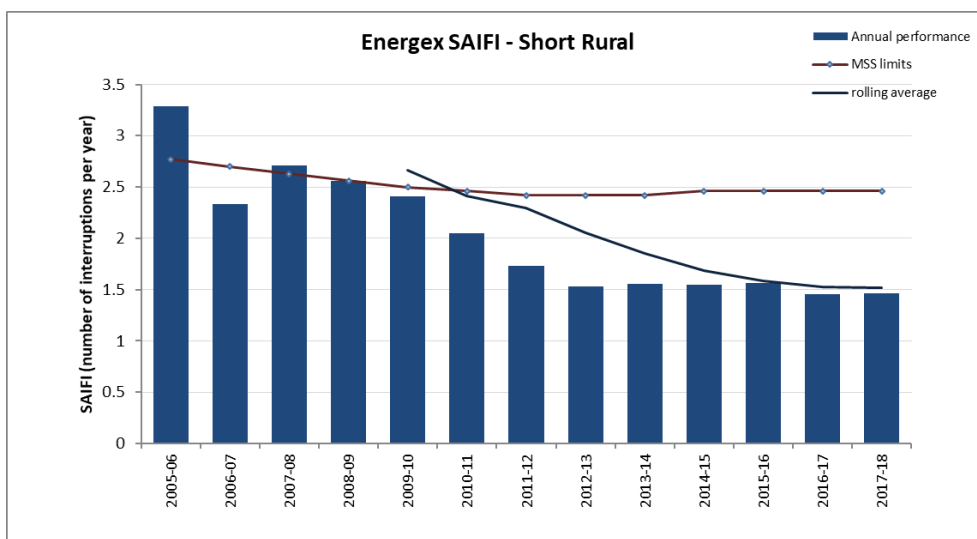
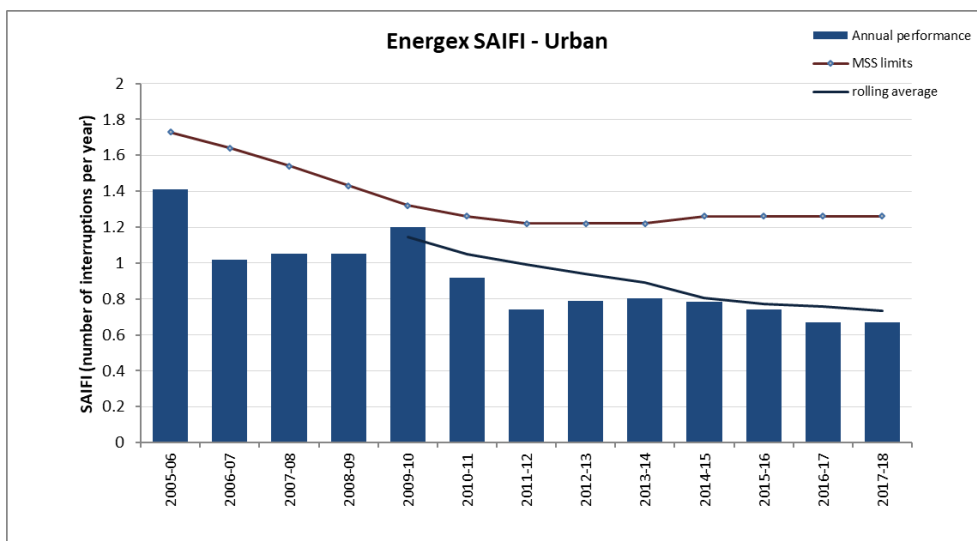
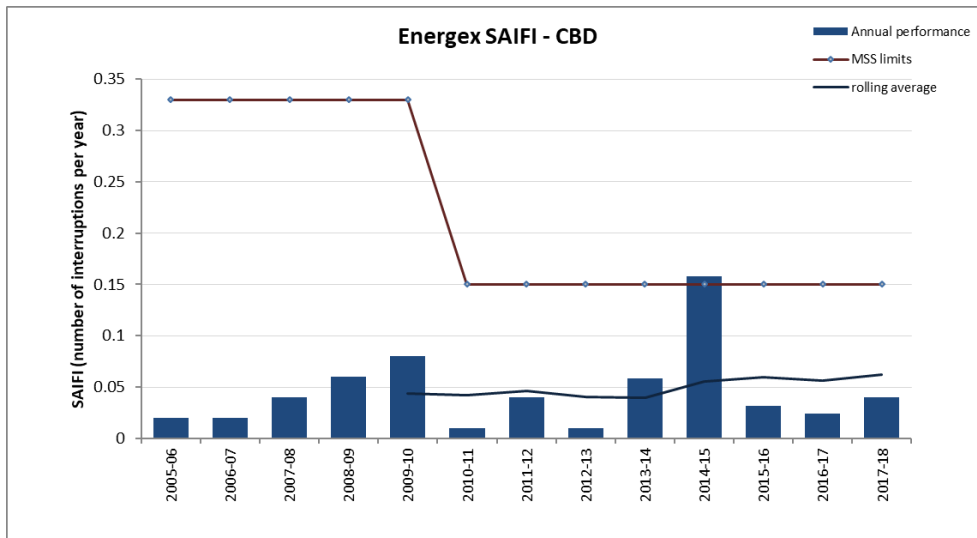
Energex notes that since the inception of MSS in 2005–06, the overall network SAIDI and SAIFI for Energex has improved 32 per cent and 52 per cent respectively, when compared to 2017–18 outcomes.¹³

¹² Department of Energy and Water Supply, *Performance against minimum service standards (MSS) by Energex and Ergon Energy for the 2014–15 financial year*, Queensland Government, 2015, p. 3.

¹³ Energex and Ergon Energy, sub. 4, p. 7.

Figure 1 Energex SAIDI and SAIFI performance





Sources: Annual MSS reports; Energex, Regulatory Proposal 2020–25, January 2019, p. 15.

Ergon Energy

While Ergon Energy was in breach of its MSS limits on a number of occasions prior to 2010–11, there have been improvements in both SAIDI and SAIFI performance since then (Figure 2). Ergon Energy has realised notable improvements in urban and short rural feeder performance, as demonstrated by the five-year rolling average, and has remained comfortably within the SAIDI and SAIFI limits for these feeder types since 2010–11.

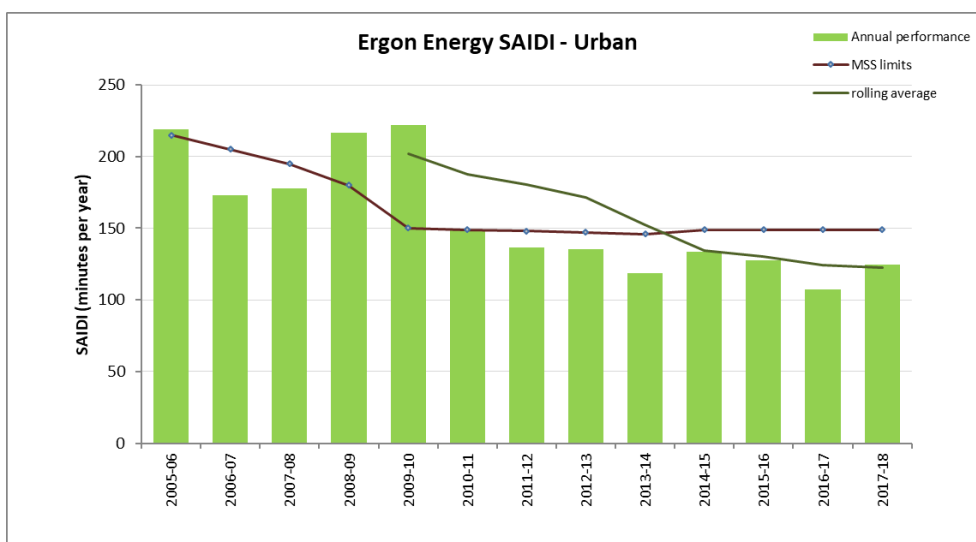
Ergon Energy's long rural SAIDI performance reveals considerable year-to-year variability, with performance not consistently remaining within the MSS limits. Performance of long rural feeders in 2014–15 breached the MSS SAIDI limits, with performance in 2015–16 just within the limit. Ergon Energy's SAIDI performance for long rural feeders has remained within the MSS limits in 2016–17 and 2017–18.

Ergon Energy has acknowledged managing long rural feeder SAIDI remains a challenge. Extensive line lengths, the predominantly radial nature of the feeders and a lack of available safe access routes following storm season and cyclones make long rural feeders more susceptible to longer outage duration/response times.¹⁴ Ergon Energy is in the process of implementing targeted low cost solutions that it expects will yield some SAIDI benefits.¹⁵

Ergon Energy has performed within its MSS SAIFI limit for all feeder types since 2010–11. SAIFI performance on urban and short rural feeders has improved, while SAIFI performance on long rural feeders displays greater annual variation, albeit remaining within the MSS limits since 2006–07.

Ergon Energy noted that overall network SAIDI and SAIFI outcomes have improved 40 per cent and 40.7 per cent respectively, since the inception of MSS in 2005–06, when compared to 2017–18 outcomes.¹⁶

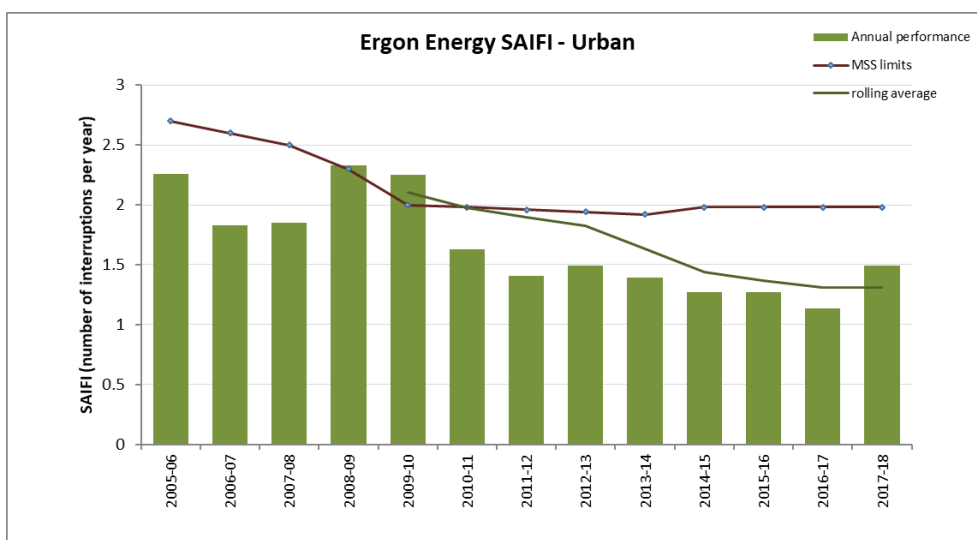
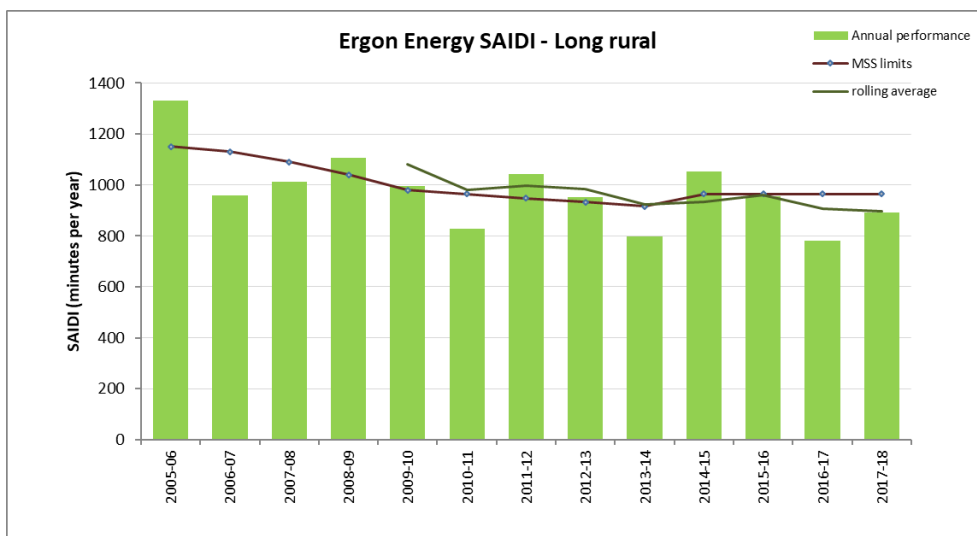
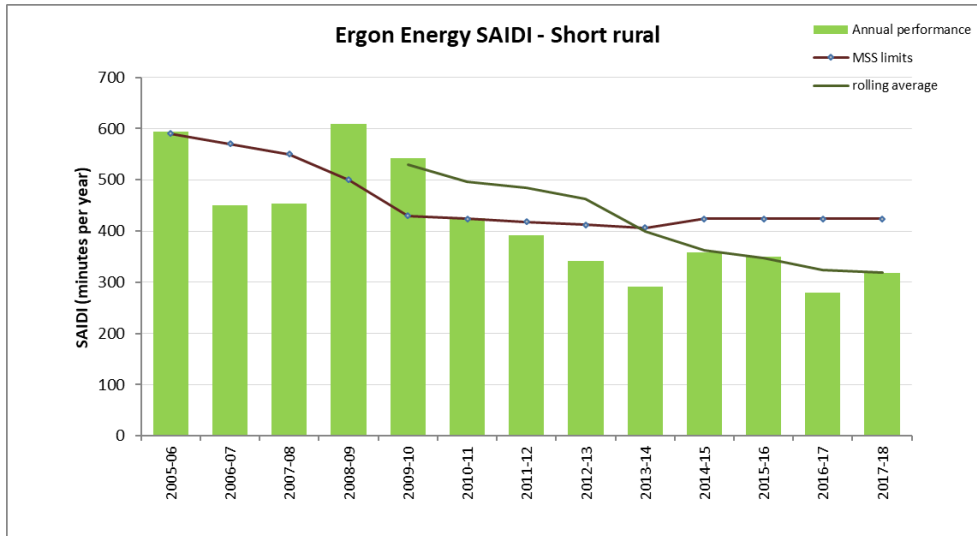
Figure 2 Ergon Energy SAIDI and SAIFI performance

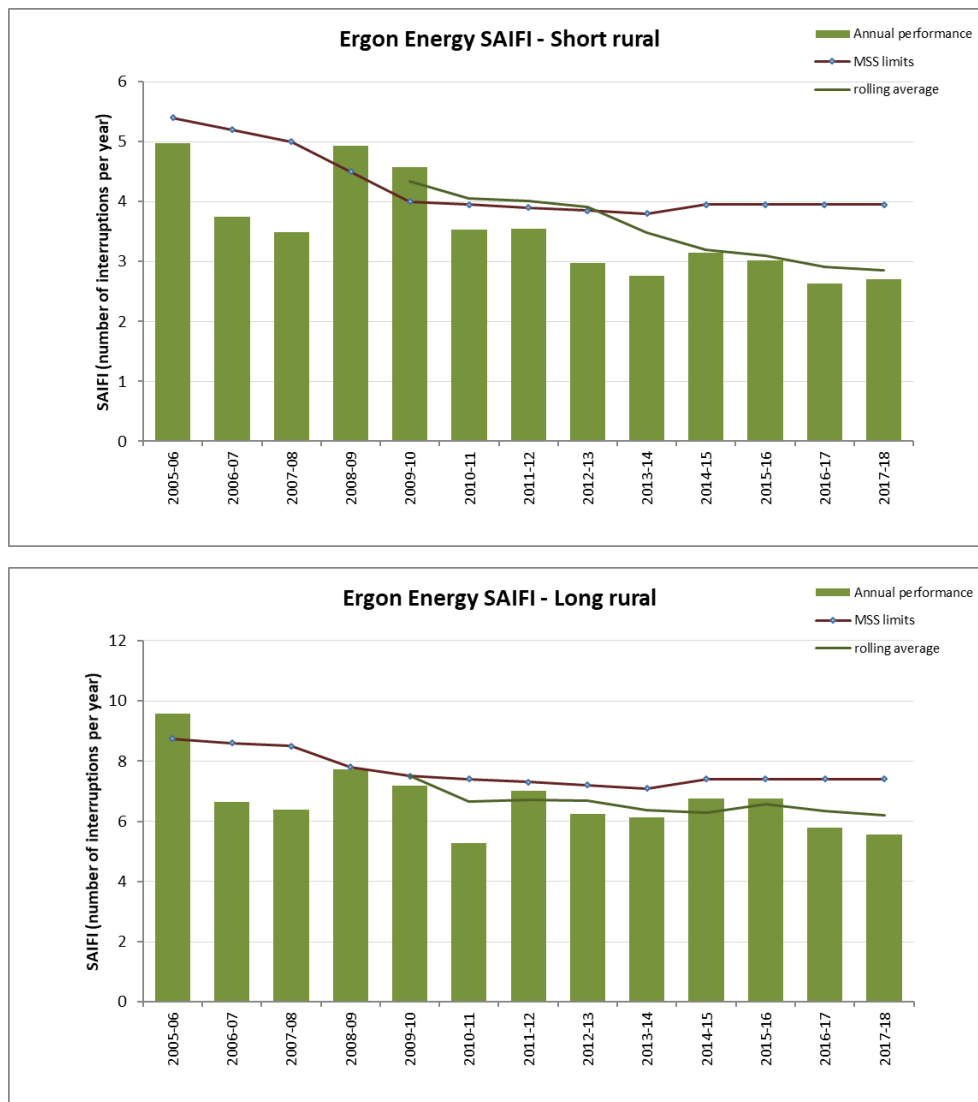


¹⁴ Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, attachment 7.048 to Energex Regulatory Proposal 2020–25, January 2019, at <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/energex-determination-2020-25/proposal> Supporting information 7.8—Capital Expenditure Forecasts).

¹⁵ This program will conclude in 2020 and will not run into the next regulatory control period. Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, January 2019, p. 9.

¹⁶ Energex and Ergon Energy, sub. 4, p. 7.





Sources: Annual MSS reports; Ergon Energy, Regulatory Proposal 2020–25, January 2019, p. 15.

2.2.2 The costs and benefits of delivering improved reliability

The Minister's direction requires the QCA to have regard to the costs and benefits of delivering improved reliability, specifically:

- the amount customers are willing to pay to increase reliability above current levels
- the financial and pricing consequences of any changes to the reliability standards.

The benefits of reliability are reflected in the value that customers place on a given level of reliability. The costs of reliability reflect the operating and capital costs that the DNSPs incur to deliver that level of reliability.

Customer preferences

The benefits of reliability for customers are often estimated by using survey and statistical methods, such as 'willingness to pay/accept', or 'value of customer reliability' studies.

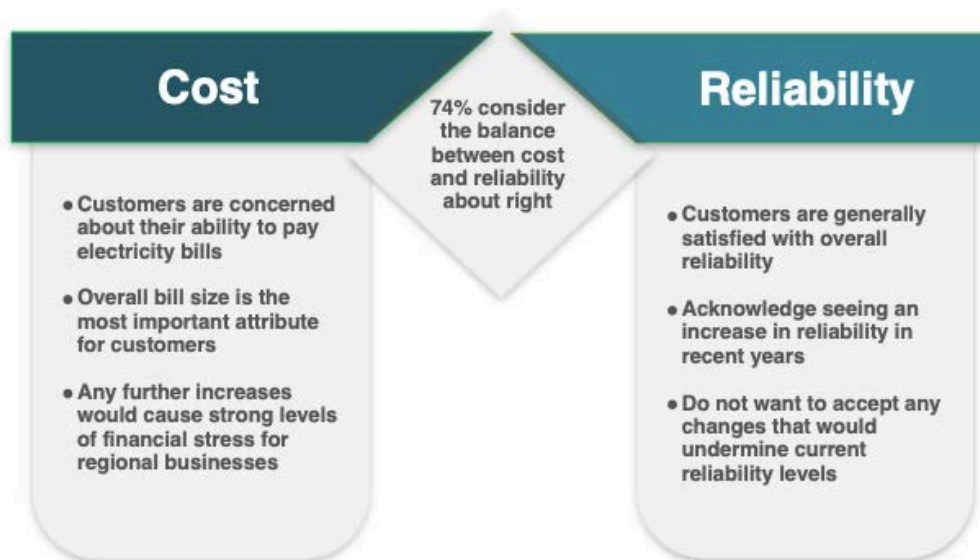
Energy Queensland has recently undertaken significant customer research of this nature for the Energex and Ergon Energy network businesses. Queensland Electricity Users Network (QEUN)

cautioned relying on Energy Queensland's customer surveys to gauge the pulse of consumers.¹⁷ The QCA has considered a range of research into customer preferences that provides an insight into the value that customers place on the reliability of electricity supply and their corresponding willingness to pay.

Recent customer research

Our review of the available research has identified that customers consider the existing balance between cost and reliability is reasonable. While electricity prices are of notable concern, customers are overall satisfied with current levels of reliability and do not want reliability to deteriorate.

Figure 3 Summary of customer attitudes towards cost and reliability



Affordability

Queensland household electricity bills have risen by around 100 per cent (in nominal terms) since 2007.¹⁸ In its Queensland Household Energy Survey, Energy Queensland reported that 51 per cent of south east Queensland households and 59 per cent of regional Queensland households were concerned about their ongoing ability to pay their electricity bill in 2017.¹⁹ This fell in 2018 to 41 per cent for south east Queensland households and to 49 per cent for regional households.²⁰ Despite this reduction, Energy Queensland found affordability of electricity was the primary concern of customers, both from cost of living and business competitiveness perspectives.²¹ These findings were supported by the Chamber of Commerce and Industry Queensland, which

¹⁷ QEUN, sub. 3, p. 7.

¹⁸ Based on increases in the nominal regulated residential retail tariff (tariff 11) and assuming median annual household consumption of 4862.92 kWh per annum. The HILDA Survey supports this, noting mean expenditure on home energy has increased in real terms since 2006; see R Wilkins & I Lass, *The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 16*, 2018, p. 52.

¹⁹ Colmar Brunton, *Queensland Household Energy Survey 2017, Insights Report*, prepared for Energy Queensland & Powerlink, 2018, p. 7.

²⁰ Colmar Brunton, *Queensland Household Energy Survey 2018, Insights Report*, prepared for Energy Queensland & Powerlink, 2019, p. 12.

²¹ Energex and Ergon Energy, sub. 4, p. 7.

noted 'small business has clearly articulated that affordability is the most pressing concern when it comes to energy policy'.²²

The results of a survey carried out by Compass Research on behalf of the QEUN found that 92 per cent of regional business respondents had experienced increases in electricity costs over the prior 12-month period.^{23,24} Of the survey respondents, 49 per cent expressed a high level of concern²⁵ regarding their ability to pay electricity bills in full and on time, with 52 per cent reporting that strong to severe levels of financial stress would occur if costs were to increase again.²⁶

The QEUN survey results found that 70 per cent of regional businesses had become less profitable because of higher electricity prices. Increasing debt, reducing staff hours and numbers, and passing on costs to customers were identified by respondents as approaches to accommodate rising electricity costs.²⁷ QEUN noted that almost all respondents said the rises in electricity prices were adversely affecting their regional economies and a fall in electricity prices would improve viability for 86 per cent of businesses, with some respondents indicating they would consider employing more staff/ increasing hours and expanding if prices were to fall.²⁸

Reliability

Energy Queensland's research indicates that customers are generally satisfied with the overall reliability of their electricity supply. Many customers acknowledged improvements in resilience and reliability in recent years, with 83 per cent of respondents in Energex and Ergon Energy's customer research reporting satisfaction with the overall reliability or quality of electricity supply in 2018.^{29,30}

Research conducted by Energy Consumers Australia presented similar findings, indicating that 84 per cent of Queensland customers were satisfied with the reliability of their supply.³¹ QEUN noted regional businesses were generally satisfied with reliability of their electricity supply, with 55 per cent giving a satisfaction rating of 8–10 (where 10 is 'very satisfied').³² The Queensland Farmers Federation (QFF) considered the improvements in reliability are expected, given the investment undertaken in the distribution networks in Queensland to date.³³

Affordability–reliability trade-offs

Energy Queensland used choice modelling to reveal the relative importance of different attributes of electricity supply, including reliability and affordability. In general, the choice

²² Chamber of Commerce and Industry Queensland (CCIQ), submission to Energy Queensland, *Energy Queensland Draft Plans 2020–25*, September 2018, p. 2.

²³ The survey was carried out between July and October 2017 and asked if the cost of electricity had risen in the last 12 months.

²⁴ Compass Research, *Impact of higher electricity prices on businesses in regional Queensland, Survey Report Overall Results*, January 2018, p. 15.

²⁵ 49 per cent gave a rating of 8–10, with a score of 10 reflecting extreme concern.

²⁶ Compass Research, *Impact of higher electricity prices on businesses in regional Queensland, Survey Report Overall Results*, January 2018, pp. 22–24.

²⁷ QEUN, sub. 3, p. 3.

²⁸ QEUN, sub. 3, pp. 3, 5.

²⁹ Energy Queensland, *Future Energy Survey 2018*, 2018, p. 2.

³⁰ Kantar Public & PwC, *AER (2020–2025) Customer Research*, qualitative research report, prepared for Energy Queensland, June 2018, p. 5.

³¹ Energy Consumers Australia, *Energy Consumer Sentiment Survey*, December 2018, p. 15.

³² QEUN, sub. 3: 7; Compass Research, *Impact of higher electricity prices on businesses in regional Queensland, Survey Report Overall Results*, January 2018, p. 15.

³³ QFF, sub. 2, p. 2.

modelling results showed consistency across both networks, across feeder types and between residential and business customers. The assessment revealed that bill size was the most important attribute to customers, and customers were significantly more sensitive to an increase in bill size than a decrease of the same amount.³⁴

The Queensland Household Energy Survey 2018 found 74 per cent of respondents across Queensland considered the existing balance between cost and reliability about right.³⁵ While Energex and Ergon Energy's customer research in 2018 found Energex customers appeared unwilling to pay for improved reliability, Ergon Energy customers indicated more tolerance for small (2 per cent) price increases in return for improved reliability and network resilience. However, most customers already expected an increase of 2–3 per cent to occur in line with inflation.³⁶ Furthermore, some customers believed that a 2 per cent price increase would deliver negligible reliability improvements. While customers expected bill increases of greater than 5 per cent should deliver better reliability and resilience, such price increases were not acceptable to customers.³⁷

Customers also acknowledged the need to ensure that network reliability and resilience do not deteriorate, with Queensland industries in particular highlighting the importance of a reliable network. Customers did not want to accept any changes that would undermine the current reliability of the network, even for a 10 per cent reduction in electricity prices.³⁸ QEUN's submission stated that consumers do not want to trade lower network reliability standards for cheaper power bills.³⁹

Previous reviews

Recent customer research has provided outcomes not dissimilar to findings revealed through work examined by the QCA during the 2014 MSS review.

The 2014 review into the MSS found that while security and reliability of electricity supply was a key concern around 2004, the focus had since shifted to a preference for price relief.

Both the ENCAP and IRPNC reviews, in 2011 and 2012 respectively, recommended adjustments to the MSS limits in order to address concerns regarding increased network costs and electricity prices, and whether reliability standards reflected a level for which customers were willing to pay. The ENCAP Panel noted:

There has been significant recent focus on the cost of electricity and in particular rising network costs ... The question as to what level of security and reliability customers are willing to accept in order to minimise increases to electricity tariffs is a key issue not just for Queensland, but also for the NEM as a whole.⁴⁰

³⁴ Kantar Public & PwC, *AER (2020–2025) Customer Research, Quantitative Research Report*, prepared for Energy Queensland, October 2018, pp. 21, 24.

³⁵ Colmar Brunton, *Queensland Household Energy Survey 2018, Insights Report*, prepared for Energy Queensland & Powerlink, 2019, p. 26.

³⁶ Kantar Public & PwC, *AER (2020–2025) Customer Research*, qualitative research report, prepared for Energy Queensland, June 2018, pp. 48–49.

³⁷ Kantar Public & PwC, *AER (2020–2025) Customer Research*, qualitative research report, prepared for Energy Queensland, June 2018, p. 48.

³⁸ Kantar Public & PwC, *AER (2020–2025) Customer Research*, qualitative research report, prepared for Energy Queensland, June 2018, p. 51.

³⁹ QEUN, sub. 3, p. 1.

⁴⁰ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, November 2011, p. 18.

Industry research at the time indicated general satisfaction with the level of reliability experienced, but low levels of satisfaction with the affordability of their electricity supply. The CCIQ considered that, given reliability of supply is considered satisfactory, there was minimal willingness by business to pay for further improvements in electricity supply reliability in the immediate future.⁴¹

It should be noted that in the period between the previous and the current MSS review, overall network reliability performance across both networks has either improved or at least remained consistently sound. The consistency between findings from previous reviews and current customer attitudes may indicate that additional improvements to reliability above the levels experienced throughout this period are of limited value to customers at this time.

AEMO's Value of Customer Reliability (VCR)

In 2014 the Australian Energy Market Operator (AEMO) completed a NEM-wide review of the 'value of customer reliability'. In doing so, AEMO provided VCR estimates that represented, in dollars per kilowatt hour, the willingness of customers to pay for the reliable supply of electricity. As part of this process, approximately 3000 customers across NEM-connected states were surveyed. Survey results indicated that the majority of residential and business customers were satisfied with the level of reliability experienced. Approximately 70 per cent of residential customers were not willing to pay to avoid a baseline outage.⁴²

The VCR estimates indicated that businesses, on average, place greater value on the reliable supply of electricity than residential customers; and Queensland users place a relatively lower value on the reliability of electricity, compared to other NEM states (only Victoria reported a lower VCR).⁴³

These findings support the outcomes of recent research and survey results, including the work completed by Energy Queensland. While these VCR estimates are now somewhat dated⁴⁴, they remain widely used across Australia for estimating the benefits of reliability for customers.

The AER is currently undertaking a review of VCR, with its first calculated VCR values to be published by 31 December 2019.⁴⁵ This work may be a useful source for any future assessment of Queensland's network reliability standards.

Costs of reliability improvements

Reliability-related expenditure is only one component of network expenditure, and it is not currently a significant driver of network costs in Queensland. Network costs are also only one component of the overall price of electricity paid by consumers.⁴⁶ Nonetheless, any change in minimum reliability standards will have an impact on network costs, which are ultimately borne by electricity consumers.

Improving network reliability performance generally requires DNSPs to incur additional capital and/or operating costs. These costs may include investment in network augmentation and

⁴¹ CCIQ, *An efficient, productive and sustainable electricity supply for Queensland: Blueprint for design, planning and management of Queensland's energy sector and electricity market*, August 2011, p. 8.

⁴² AEMO, *Value of Customer Reliability Review*, final report, September 2014, p. 19.

⁴³ AEMO, *Value of Customer Reliability Review*, final report, September 2014, pp. 1, 18.

⁴⁴ The QCA notes concerns were also raised in relation to how AEMO's VCR estimates were derived.

⁴⁵ AER, *Value of Customer Reliability*, consultation paper, October 2018, p. 6.

⁴⁶ Around 40–50% of a typical residential retail bill.

reinforcement, and operating costs to deliver enhanced inspection, maintenance and vegetation management programs, for example.

Energex and Ergon Energy consider any step change from the current reliability outcomes will require specific investment:

[O]ur network reliability outcomes could have reached the plateau, possibly indicating the optimal performance capability of the network without further reliability specific investment on its infrastructure.⁴⁷

Energex and Ergon Energy advised that they have developed their 2020–25 expenditure forecasts consistent with customer preferences for affordability and maintaining the current levels of MSS reliability.⁴⁸ As such, the DNSPs have not sought to quantify the levels of expenditure that may be needed to deliver incremental improvements in average SAIDI or SAIFI outcomes. Energex and Ergon Energy noted:

[W]e have considered the reliability outcomes of our proposed investment levels for the next regulatory control period based on our current reliability performance, and believe we can maintain reliability levels (SAIDI & SAIFI) at their current levels while delivering on our commitment to reduce the cost of supplying electricity to our customers.⁴⁹

Balancing the costs and benefits of improved reliability

Many factors influence the value that individual customers place on reliability. Generally, as customers experience an increasingly reliable supply, the value they attribute to further improvements in reliability tends to diminish. At the same time, the costs of delivering further reliability improvements tend to increase.⁵⁰ Eventually, network reliability outcomes will approach a point where the cost of delivering even better reliability outcomes outweighs the value that customers attribute to that improved reliability. Beyond this point, it typically becomes inefficient for DNSPs to pursue further reliability improvements, at least from an average reliability perspective.⁵¹

The past decade has seen significant reliability improvements along with strong and reasonably consistent reliability performance from Energex and Ergon Energy. Most customers are now experiencing much better reliability than 10 years ago. Consumer sentiment also suggests general satisfaction with current levels of reliability, and limited willingness to accept price increases in return for improved reliability. Affordability appears to be the key concern among electricity consumers. These findings are generally consistent with those of the 2014 MSS review, as discussed above. Given overall network reliability has been at least consistent or has improved since the 2014 review, the consistency in customer attitudes may indicate any further improvement to reliability is of limited value to customers at this time.

At the same time, the introduction of tighter reliability standards in 2005 has driven the DNSPs to make significant investments in measures to improve reliability. These efforts have delivered material reliability improvements. At some point, opportunities for cost-effective reliability

⁴⁷ Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, January 2019, p. 9.

⁴⁸ Targeted reliability expenditure is forecast for worst performing feeder improvements only.

⁴⁹ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 2.

⁵⁰ In economic terms, the efficient level of reliability is delivered when the marginal benefit of a further improvement in reliability equals the marginal cost of delivering that improvement.

⁵¹ Further reliability improvements may still be efficient in some parts of the network, for example, worst performing feeders.

improvements will be largely exhausted, and delivering further improvements is likely to require increasingly costly solutions.

These conditions suggest that further tightening of the MSS limits may be unnecessary for the 2020–25 period. Maintaining the MSS limits at their current levels would preserve the existing level of performance that customers appear to be largely satisfied with, while having no material impact on costs, other things being constant. This approach is supported by the DNSPs, which proposed that the current MSS limits should be retained for the 2020–25 period. In arriving at this position, Energex and Ergon Energy noted that they gave careful consideration to the fact that increases in reliability performance would result in an increased cost to customers, while a decrease in performance was unlikely to result in any meaningful price reduction.⁵² Energex and Ergon Energy also noted that they are not forecasting any reliability specific capital investment for the foreseeable future.⁵³

QEUN considered that in most cases the current MSS limits remain appropriate, while QFF considered that reliability standards can be maintained, without further increasing electricity prices.⁵⁴ The QCA has not received any submissions arguing that reliability should be improved, or that there is any strong willingness to pay for better reliability.

2.2.3 QCA conclusions

The QCA recommends that the MSS limits for SAIDI and SAIFI should be held at their current levels for the 2020–25 period. In our view, there is no compelling case to change the MSS limits, because of the following reasons:

- There have been significant improvements in reliability for both Energex and Ergon Energy customers in recent years. Customers are generally satisfied with the reliability levels currently experienced.
- Further improvements to reliability would require reliability-specific investment in infrastructure and result in an increased cost to customers. Customers have indicated that affordability of electricity prices is a key concern.
- Customers consider the existing balance between affordability and reliability appropriate and are generally unwilling to pay for improved reliability.
- Relaxing reliability standards is unlikely to result in any meaningful price reductions in the short to medium term. Regardless, customers do not want reliability levels to deteriorate.

Recommendation 1

- The MSS limits for SAIDI and SAIFI for both Energex and Ergon Energy should be maintained at their current levels for the 2020–25 period.

⁵² Energex and Ergon Energy, sub. 4, p. 7.

⁵³ Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, January 2019, p. 4.

⁵⁴ QFF, sub. 2, p. 3.

2.3 Definitions and exclusions

The QCA has been directed to recommend whether the definitions and exclusions for SAIFI and SAIDI included in Energex and Ergon Energy's distribution authorities should be amended to align with the corresponding definitions used in the STPIS.

2.3.1 QCA conclusions

Both Energex and Ergon Energy have expressed support for closer alignment of the MSS definitions and exclusions with the STPIS to minimise confusion and inefficiencies in both outage management and reporting.⁵⁵

In general, the QCA considers there should be consistency between the definitions and exclusions used in the distribution authorities and those used in the STPIS. This minimises inefficiencies and unnecessary complexity in the DNSPs' reliability obligations and reporting requirements.

Nonetheless, in some instances it is appropriate for the distribution authorities to be different from the STPIS. For example, the QCA considers the SAIFI and SAIDI limits under the distribution authorities should continue to include planned interruptions, despite these being excluded under the STPIS. The different approach is justified based on the different purposes of these two arrangements; the MSS seek to ensure that customers have a minimum level of disruptions to their supply, whereas the STPIS is an incentive scheme designed to maintain and improve service performance based on financial rewards and penalties.

Further, differences in the definitions and exclusions may also be necessary to reflect the terminology and statutory context of the distribution authorities, as well as the operating environments of Energex and Ergon Energy.

Recalibration of MSS limits

Changing the MSS definitions could have a material impact on reported performance, for example if planned interruptions were to be excluded in order to align with STPIS. However, given our recommendation that planned interruptions should continue to be included in the MSS limits, there is no need to recalibrate the MSS limits to ensure they remain fixed in relative terms.

We have also considered the potential impact of other recommended changes to definitions and exclusions. Specifically, the revised definition of a momentary interruption may result in SAIFI performance that is relatively more favourable, other things constant. Energex and Ergon Energy have provided back-casting analysis that indicates the average impact of the revised definition on overall reported five-year average SAIDI performance is less than 1 per cent and less than 5 per cent for SAIFI.⁵⁶

The QCA's assessment of the definitions and exclusions in the distribution authorities is set out in Appendix D, with all of the QCA's recommended amendments to definitions and exclusions in the distribution authorities set out in Appendix C.

The QCA considers the impact of our recommended amendments to definitions and exclusions are not sufficient to warrant recalibration of the MSS limits at this time.

⁵⁵ Energex and Ergon Energy, sub. 4, pp. 8–9.

⁵⁶ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 12.

Recommendation 2

- The QCA recommends various amendments to the distribution authorities for consistency with the AER's STPIS (see Appendix C). Key recommended amendments are:
 - (a) New definitions should be included in the distribution authorities to detail how the SAIFI and SAIDI measures are to be calculated.
 - (b) The definition of 'urban feeder' should be amended to apply a three-year average threshold.
 - (c) Amendments should be made to the list of exclusions from the SAIFI and SAIDI limits, including the exclusion of interruptions of 'three minutes or less'.

3 WORST PERFORMING FEEDERS

The QCA recommends that the worst performing feeder provisions of the distribution authorities should be aligned to apply consistently for Energex and Ergon Energy. Doing so may allow Energy Queensland to realise efficiencies in identifying, reporting and remediating worst performing feeders across both of its Energex and Ergon Energy network businesses. Alignment will also support more equitable outcomes for worst-served customers across both Queensland distribution networks.

We consider that Energy Queensland's proposed revisions to the worst performing feeder criteria for Energex and Ergon Energy are generally reasonable and can be adopted, subject to some amendments.

3.1 Overview

The SAIDI and SAIFI MSS limits are targeted at ensuring Energex and Ergon Energy deliver an acceptable average level of reliability performance by feeder type. However, targeting and reporting reliability performance in this way masks the fact that some feeders perform much better than average and others perform much worse.

To address this issue, the distribution authorities require Energex and Ergon Energy to monitor and annually report on their WPFs, and to implement programs to improve their reliability performance. The stated purpose of the WPF improvement obligations is to enable customers with the worst reliability outcomes to benefit from tailored network improvements.⁵⁷

The current obligations regarding WPFs (Table 6) are set out in clause 11 of the distribution authorities. There are a number of differences between the criteria applying to Energex and Ergon Energy. The terms of reference require the QCA to recommend whether the WPF components should be aligned so they are treated consistently in both distribution authorities. In summary, the differences are:

- Feeders subject to improvement requirements are characterised as 'distribution feeders' for Ergon Energy and '11 kV feeders' for Energex.
- The application of improvement programs for Ergon Energy makes reference to 'programs applying over a five-year work program', while Energex's requirement does not make such a distinction.
- Ergon Energy's WPF improvement obligations are based on SAIDI outcomes, while Energex's obligations are based on SAIDI and/or SAIFI outcomes.
- To be classified as a WPF, a feeder should demonstrate that its reliability exceeds the relevant MSS limit by a given percentage. This percentage level of exceedance is greater for Ergon Energy (200 per cent) than for Energex (150 per cent).
- Classification as a WPF is expressed as percentile performance ranking for Energex (within the worst 10 per cent of feeders by performance), and an absolute value for Ergon Energy (within the 50 worst performing feeders, except those serving less than 20 customers).

⁵⁷ Clause 11.1 of the distribution authorities.

- Under clause 11.2(c)(i) of both distribution authorities, 'three-year average' performance applies to different criteria for defining a WPF (percentile measure for Energex, and percentage exceedance measure for Ergon Energy).

Table 6 Current worst performing feeder improvement requirements

<i>Clause</i>	<i>Energex</i>	<i>Ergon Energy</i>
11.2 (a)	From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the reliability of the distribution entity's worst performing 11 kV feeders;	From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the reliability of the distribution entity's worst performing distribution feeders;
11.2 (b)	The distribution entity will implement a program to improve the reliability on the worst performing 11 kV feeders based on the criteria set out in Clause 11.2(c); and	The distribution entity will implement a program to improve the reliability on the worst performing distribution feeders based on the criteria set out in Clause 11.2(c); and
11.2 (c)	The worst performing 11kV feeder program will apply to any 11kV feeder which meets the following criteria: (i) The 11kV feeder is in the worst 10% of the network's 11kV feeders based on its three year average SAIDI/SAIFI performance; and (ii) The 11kV feeder's SAIDI/SAIFI outcome is 150% or more of the MSS SAIDI/SAIFI limit applicable to that category of 11kV feeder.	The worst performing distribution feeder program which applies across a 5 year work program will apply to any distribution feeder which meets the following criteria: (i) The distribution feeder's three year average SAIDI outcome is 200% or more of the MSS SAIDI limit applicable to that category of distribution feeder; and (ii) The distribution feeder is determined to be in the 50 worst performing feeders across all feeder categories, excluding feeders with less than 20 customers.

Sources: Distribution authorities, clause 11.2.

3.2 Proposed amendments to worst performing feeder provisions

Energy Queensland has suggested there is merit in making the WPF requirements consistent between its Energex and Ergon Energy businesses. It suggested that both distribution authorities should be amended such that the WPF improvement programs apply to any distribution feeder that meets the following criteria:

- The distribution feeder is in the worst 5% of the network's distribution HV (high voltage) feeders, based on its three-year average SAIDI/SAIFI performance.
- The distribution HV feeder's SAIDI/SAIFI outcome is 200% or more of the MSS SAIDI/SAIFI limit applicable to that category of the feeder.

Energy Queensland also submitted that 11 kV distribution feeders with less than 20 customers be excluded from Energex's WPF requirements. Energy Queensland noted that while these feeders are few in number, excluding them would align Energex's definition to Ergon Energy's current definition.⁵⁸

In recommending these changes, Energy Queensland said that aligning the definitions will allow equal inclusion of worst-served customers across south east and regional Queensland. Energy Queensland noted that Energex has 110 of its feeders subject to WPF improvement programs whereas Ergon Energy's program is limited to the top 50 distribution feeders, consistent with the

⁵⁸ Energex and Ergon Energy, sub. 4, p. 12.

distribution authority requirements. Energy Queensland has noted that the revised criteria would not compromise the potential outcomes for the worst-served customers on similar distribution feeders in the two networks.⁵⁹

Energy Queensland also noted that, due to the inclusion of SAIFI, Energex must also address the failure rates (frequency of interruptions) on its distribution feeders, while Ergon Energy currently must only target SAIDI based improvement options. Energy Queensland said that including a SAIFI element in Ergon Energy's WPF requirements will address the reliability experience of customers receiving poor frequency of outages and not just outage duration.⁶⁰

With the exception of Energy Queensland, no stakeholders commented on the worst performing feeder provisions.

3.3 QCA analysis and conclusions

The QCA considers that the WPF provisions play an important role in the network reliability framework, by ensuring that customers experiencing the lowest reliability are not ignored in the pursuit of meeting average, feeder-level, reliability targets.

In undertaking its review, the QCA has sought to address two key issues, specifically, whether:

- the WPF criteria should be aligned to apply consistently between Energex and Ergon Energy
- the means of aligning the criteria as suggested by Energy Queensland is reasonable.

Should the WPF criteria be aligned?

The QCA considers it reasonable that the WPF obligations apply in a consistent way across Energex and Ergon Energy, to the extent possible.

Aligning the WPF criteria is also consistent with the Australian Energy Market Commission's (AEMC) recommendation that a method for assessing the areas with the lowest reliability customers should be able to be applied consistently across the jurisdictions and distributors, except where it can be shown that it is in the long-term interest of consumers to consider any unique characteristics of the network.⁶¹ Energy Queensland's proposed revisions to the WPF criteria appear to satisfy this principle.

The QCA notes that Energy Queensland has proposed to revise the criteria for identifying WPFs only, not the core obligations relating to them as set out in clauses 11.2 (a) and (b) of the distribution authorities, which are common across both DNSPs. Consistent with the requirements of the Minister's direction, the QCA is considering only matters relevant to aligning the provisions of Energex and Ergon Energy, and has not considered the appropriateness of the remaining provisions at clause 11.

Assessment of Energy Queensland's proposed amendments

Aligning the WPF criteria may have some impact on the scope and cost of delivering the WPF programs across both DNSPs. The QCA considers it important to have regard to these implications. We also consider it relevant to consider similar arrangements in other jurisdictions, and relevant national policy guidance offered by the AEMC and AER, when forming a view on the reasonableness of Energy Queensland's proposed criteria.

⁵⁹ Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, January 2019, pp. 27–28

⁶⁰ Energex and Ergon Energy, sub. 4, p. 12.

⁶¹ AEMC, *Review of Distribution Reliability Measures*, Final Report, September 2014, p. 40.

Jurisdictional approaches

Most Australian jurisdictions prescribe some form of obligations to identify and/or remediate parts of the network that experience particularly unfavourable reliability (Appendix G).

Thresholds for defining 'worst' performance are typically expressed as multiples of minimum average feeder performance targets, or average actual feeder performance. However, the levels at which these thresholds are set vary across jurisdictions and appear to be largely subjective.

The QCA considers there is no single correct way to define the worst performing parts of a network. When compared with other jurisdictional approaches for identifying poor performing parts of the network, the criteria proposed by Energy Queensland appear reasonable.

The characterisation of Energy Queensland's proposed criteria is also broadly consistent with the AEMC's recommended approach to identifying lowest reliability customers (Appendix G).

Impacts on the scope and cost of WPF improvement programs

Clearly, any change in criteria that increases the number of WPFs identified will increase the number of potential candidate feeders for WPF improvement expenditure. This has the potential to extend the benefits of the programs to a greater number of customers, but also to increase program costs. On the other hand, any change in WPF criteria that results in fewer WPFs being identified would likely reduce the scope of the WPF program over time and the number of customers who can potentially benefit from it.

The AEMC also noted the relationship between threshold criteria and scope of improvement activities that these criteria imply. In the AEMC's view, the threshold criteria for identifying lowest reliability should be set at levels that focus the DNSP on an appropriate number of customers/feeders.⁶² It further noted:

The development of a specific process to identify the lowest reliability feeders or feeder sections would need to review historical reliability data to ensure that the appropriate level of burden is placed on the distributor.⁶³

Energy Queensland provided analysis to demonstrate the impact of adopting the revised criteria, based on feeder performance in 2017–18. Based on this analysis, the revised WPF criteria would result in Ergon Energy reporting an additional 31 distribution feeders (primarily short and long rural feeders) as WPFs, and increase the number of customers reached from 7,000 to 15,000. This increase in scope is estimated to increase the cost of Ergon Energy's 2020–25 WPF program by around \$2.7 million from its current \$4.7 million.⁶⁴

For Energex, the revised criteria would reduce the number of WPFs currently reported from 140 to 84. This includes the impact of excluding 18 distribution feeders that supply fewer than 20 customers, which in total supply 110 customers.⁶⁵

Notwithstanding the reduced scope of the WPF reporting, Energex anticipates no change in the number of feeders to be targeted under its 2020–25 WPF improvement program. This is because Energex's proposed WPF program has already been rationalised for the 2020–25 period and is projected to be around 40 per cent lower in cost than the 2015–20 WPF program.⁶⁶

⁶² AEMC, *Review of Distribution Reliability Measures*, final report, September 2014, p. 43.

⁶³ AEMC, *Review of Distribution Reliability Measures*, final report, September 2014, p. 43.

⁶⁴ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 2.

⁶⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 4.

⁶⁶ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 3–4.

QCA conclusions

In the QCA's view, aligning the WPF criteria for Energex and Ergon Energy is reasonable and may provide opportunities for efficiencies in identifying, reporting and remediating worst performing feeders across both DNSPs. Alignment will also support more equitable outcomes for worst-served customers across both Queensland DNSPs.

We consider that Energy Queensland's proposed WPF criteria are generally consistent with the key principles identified by the AEMC, and appear largely reasonable when compared with other jurisdictional arrangements.

The QCA understands that Energy Queensland's objective is to align the WPF criteria applying to Energex and Ergon Energy, rather than change the reach of their WPF improvement programs. Accordingly, the QCA considers that any revision to the criteria should aim to deliver the efficiency benefits of alignment, while minimising any step-change in the scope and cost of the programs, or the benefits accruing to customers.

That said, given the distinct differences between the current WPF provisions of Energex and Ergon Energy, any changes to bring the two into alignment will have an impact on the number of feeders identified as WPFs for each DNSP. This will have consequential impacts on the scope and cost of improvement programs. Based on the analysis available, the QCA considers that the potential impact on scope and cost is not unreasonable given the significance of the changes needed to achieve alignment. However, the QCA does not express a view on the efficiency or prudence of Energex and Ergon Energy's proposed WPF expenditures. It is the AER's role to form a view on these costs against the expenditure criteria and objectives of the NER.

Feeders supplying fewer than 20 customers

While we consider Energy Queensland's proposed criteria largely reasonable, we do not consider that feeders supplying fewer than 20 customers should be excluded from WPF reporting.

Automatic exclusion of WPFs with fewer than 20 customers is, in effect, an assumption that these feeders will show no prospects for prudent and efficient reliability improvement. This may well be true for some of these feeders where high per-customer costs of improvement can result in unfavourable cost-benefit ratios. However, the QCA considers that these feeders should, at a minimum, be identified and monitored.

Including these feeders in the WPF criteria will create an obligation for Ergon Energy to monitor and report on reliability of these feeders in its distribution annual planning report (DAPR). In 2018–19 Ergon Energy identified 52 feeders, each supplying fewer than 20 customers, which meet the current WPF criteria.⁶⁷ We do not consider that formal reporting of these feeders will materially increase the compliance burden compared with the current arrangements. In response to the draft report, Energex and Ergon Energy supported the inclusion of reporting for feeders supplying fewer than 20 customers.⁶⁸

The QCA is cognisant that identifying Ergon Energy's WPFs with fewer than 20 customers will also bring these feeders into scope for potential improvement programs. This has potential to extend the benefits of improvement programs to more customers, but also to increase costs. However, identifying these feeders as WPFs will not necessarily translate into a larger or more costly WPF program.

⁶⁷ Ergon Energy, *Distribution Annual Planning Report 2018–19 to 2022–23*, pp. 141–42.

⁶⁸ Energex and Ergon Energy, sub. 5, p. 18.

The WPF provisions of the distribution authorities define WPFs and establish requirements to monitor and report on performance, and to implement improvement programs. However, these provisions are not deterministic drivers of investment. The DNSPs face no obligations to remediate any minimum number of feeders by any specific means, or within any prescribed timeframes.

The DNSPs are responsible for how, and if, they choose to improve WPFs, informed by investigations into the causes of low reliability, and engineering and economic assessments of potential solutions. In some cases, these assessments may reveal no opportunities for prudent and efficient improvement. This can be the case where the cause of low reliability cannot be readily or efficiently mitigated; for example, severe weather, remoteness and limited accessibility, or outages occurring on upstream sections of the network. Furthermore, where viable solutions can be identified, these will not always be supported by favourable cost–benefit analysis.

Where efficient and prudent improvement opportunities can be identified, we would expect further filtering to be applied to prioritise expenditures among the WPFs, based on other factors.

Recommendation 3

- The QCA recommends that the WPF components of the distribution authorities be amended so they are treated consistently between Energex and Ergon Energy, as set out in Appendix E.
- The proposed WPF criteria suggested by Energy Queensland are largely reasonable; however, feeders supplying fewer than 20 customers should not be excluded from WPF reporting and monitoring obligations.

4 SERVICE SAFETY NET TARGETS

The QCA's view is that Energy Queensland's proposed amendments to the service safety net provisions for Ergon Energy are generally reasonable. However, we do not consider it necessary to revise Ergon Energy's restoration targets to remove the timeframes for full restoration of supply.

We note that Energex and Ergon Energy have signalled the need for more significant reform of the safety net provisions in future, to achieve closer alignment between the two networks; however, this will not be achieved before the 2020–25 regulatory period. Considerable scope remains for further reform of the safety net provisions; we recommend these matters be revisited in advance of the 2025–30 regulatory period.

4.1 Overview

The DNSPs' distribution authorities include 'service safety net target' (safety net) obligations. At a high level, these obligations establish targets for the timely restoration of supply following significant interruptions arising from 'N-1' events. These events represent interruptions resulting from the failure of one key component of network infrastructure (e.g. loss of a feeder or transformer), which typically affects a large number of customers. The distribution authorities characterise the intent of the safety net provisions as seeking to:

effectively mitigate the risk of low probability–high consequence network outages to avoid unexpected customer hardship and/or significant community or economic disruption.⁶⁹

The current safety net provisions were introduced in 2014 in recognition that the N-1 security standards may be achieved through more efficient means than simply increasing redundancy by duplicating critical assets. For example, the impact of outages following N-1 events can be minimised by switching operations, reconfiguring the network, and deploying mobile generation and substation units.

The distribution authorities require the DNSPs to design, plan and operate their supply networks to ensure, to the extent reasonably practicable, that they achieve these safety net targets. Since 1 July 2015, the DNSPs have been required to monitor and report on performance against the safety net targets as part of their DAPRs.

The current distribution authorities prescribe different safety net provisions for Energex and Ergon Energy (see Table 7). In summary, the safety net provisions differ in the following ways:

- Targets for Energex apply to feeder types, whereas Ergon Energy's targets apply to broader definitions of areas.
- Energex's provisions permit some defined interruption types to be excluded when determining performance against the safety net targets. These exclusions are largely consistent with those relevant to the calculation of SAIDI and SAIFI performance.⁷⁰ Ergon Energy's safety net provisions do not provide for any exclusions.

⁶⁹ Clause 10.1 of the distribution authorities.

⁷⁰ While interruptions of less than one minute are excluded when determining SAIDI and SAIFI performance, such interruptions are not excluded when determining performance against the safety net targets (Energex only).

- Energex's restoration targets are expressed as 'load not supplied' and 'number of customers without supply'. Ergon Energy's targets do not make reference to the 'number of customers without supply'.
- The absolute targets for restoration of supply differ significantly.

Table 7 Current service safety net targets for Energex and Ergon Energy

<i>Feeder type / area</i>	<i>Restoration target following an N-1 event / exclusions</i>	
	<i>Energex</i>	<i>Ergon Energy</i>
CBD	Any interruption in customer supply resulting from an N-1 event at the sub-transmission level is restored within 1 minute.	n/a
Urban	<ul style="list-style-type: none"> • No greater than 40 MVA (16,000 customers) is without supply for more than 30 minutes. • No greater than 12 MVA (5,000 customers) is without supply for more than 3 hours. • No greater than 4 MVA (1,600 customers) is without supply for more than 8 hours. 	n/a
Short rural	<ul style="list-style-type: none"> • No greater than 40 MVA (16,000 customers) is without supply for more than 30 minutes. • No greater than 15 MVA (6,000 customers) is without supply for more than 4 hours. • No greater than 10 MVA (4,000 customers) is without supply for more than 12 hours. 	n/a
Regional centre	n/a	Following an N-1 event, load not supplied must be: <ul style="list-style-type: none"> • less than 20 MVA after 1 hour • less than 15 MVA after 6 hours • less than 5 MVA after 12 hours • fully restored within 24 hours.
Rural areas	n/a	Following an N-1 event, load not supplied must be: <ul style="list-style-type: none"> • less than 20 MVA after 1 hour • less than 15 MVA after 8 hours • less than 5 MVA after 18 hours • fully restored within 48 hours.
Exclusions	In determining whether the distribution entity has achieved its safety net targets, the following interruptions will not be taken into account: (a) an interruption resulting from:	n/a

Feeder type / area	Restoration target following an N-1 event / exclusions	
	Energex	Ergon Energy
	(i) load shedding due to a shortfall in generation (ii) a direction by AEMO, a system operator or any other body exercising a similar function under the Act, the NER or the NEL (iii) automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards (iv) a failure of the shared transmission grid, or (v) a direction by a police officer or another authorised person exercising powers in relation to public safety (b) any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day (c) an interruption caused by a customer's electrical installation or failure of that electrical installation.	

Notes: 'Regional centre' relates to larger centres with predominantly urban feeders. 'Rural areas' relates to areas that are not regional centres.

Sources: Energex distribution authority, clause 10.3 and Schedule 3; Ergon Energy distribution authority, Schedule 4.

The Minister's direction requires the QCA to recommend whether Ergon Energy's safety net obligations should be amended for the 2020–25 period.

4.2 Proposed amendments to the service safety net target provisions

Energy Queensland suggested a range of amendments to the safety net provisions in Ergon Energy's distribution authority to better align the two DNSPs' distribution authorities. The suggested amendments are as follows:

- Change clause 1.2 of the distribution authority to define a 'larger centre' as 'a town/city with a population of 6,000 or more people'.
- Add a new clause 10.3 to the distribution authority titled 'Exclusions for Safety Net' which lists the following interruption types, which will not be taken into account in determining whether Ergon Energy has achieved its service safety net targets:
 - an interruption resulting from:
 - load shedding due to a shortfall in generation
 - a direction by AEMO, a system operator or any other body exercising a similar function under the Act, the NER or the NEL
 - automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards

- a failure of the shared transmission grid, or
- a direction by a police officer or another authorised person exercising powers in relation to public and/or employee safety
- any interruption to the supply of electricity on the distribution entity’s supply network which commences on a major event day
- an interruption occurring during a state or federally declared natural disaster event beginning on the day of the event through to declaration of the end of the emergency condition
- an interruption occurring in a network where planned works are being undertaken, which materially impacts the outage risk profile of that network
- an interruption caused by a customer’s electrical installation or failure of that electrical installation
- an interruption caused by a retailer’s actions.
- Change Schedule 4 (Service Safety Net Targets) of the distribution authority so that the requirement to be:
 - 'Fully restored within 24 hours' is removed from the regional centre category
 - 'Fully restored within 48 hours' is replaced with 'Less than 1MVA after 48 hours' in the rural areas category.
- Include customer numbers in Ergon Energy's service safety net targets (set out in Table 8).

Table 8 Ergon Energy's proposed service safety net targets

<i>Targets (for restoration of supply following a credible contingency event)</i>	
<i>Regional centre</i>	<i>Rural areas</i>
1. Less than 20 MVA (8000 customers) after 1 hour 2. Less than 15 MVA (6000 customers) after 6 hours 3. Less than 5 MVA (2000 customers) after 12 hours	1. Less than 20 MVA (8000 customers) after 1 hour 2. Less than 15 MVA (6000 customers) after 8 hours 3. Less than 5 MVA (2000 customers) after 18 hours 4. Less than 1 MVA after 48 hours

In response to the QCA's discussion paper, Energy Queensland said that its proposed amendments would achieve better alignment between Ergon Energy and Energex safety net measures, and are reflective of the intent of the safety net, while balancing affordability and network security.⁷¹

Energy Queensland also noted that, in the longer term, it is planning more significant changes to align the safety net provisions across both Energex and Ergon Energy but these would not be resolved prior to the 2020–25 regulatory period. Energy Queensland recommended the adoption of its proposed changes in the interim, to provide a greater level of alignment across Queensland.⁷²

⁷¹ Energex and Ergon Energy, sub. 4, p. 13.

⁷² Energex and Ergon Energy, sub. 4, p. 13.

Energy Queensland also indicated that its proposed criteria would not result in detriment to customers. It stated:

Ergon Energy and Energex will always restore power outages as quickly as possible for customers regardless of where they are in Queensland. The Safety Net security criterion underpins network augmentation investment and hence we are very cautious to ensure that the criteria do not result in unintended consequences or investment and hence increased prices to customers. The amendments we have suggested are aimed at addressing these concerns.⁷³

Ergon Energy submitted that it will not change its focus on restoring supply to all customers as soon as possible, regardless of its security criteria requirements.⁷⁴ Ergon Energy further noted that the amendments are not forecast to result in any reduction to security or performance to customers when compared with their current supply arrangements.⁷⁵

No other stakeholders made submissions on matters regarding the safety net provisions.

4.3 QCA analysis and conclusions

The QCA appreciates that network security and customer reliability are distinct issues, even though they are related. Safety net targets should not be interpreted as targets for the restoration of supply to individual customers following any interruption. Rather, these criteria are high-level network planning tools, developed to ensure network assets are built and operated to a standard that minimises the consequences of high-impact, low-probability events.

However, the QCA is mindful that changes to security of supply criteria may have implications for network security, resilience and reliability over time, as well as for costs borne by customers.

To determine if Ergon Energy's proposal is reasonable, the QCA considers that it ought to be demonstrated that adopting the revised safety net provisions will deliver benefits to customers and/or the network businesses that outweigh any associated costs. Three key elements of the Ergon Energy proposal could have an impact on outcomes under the safety net:

- removal of thresholds for full restoration
- adding provisions for excluded interruptions
- defining a 'larger centre'.

Thresholds for full restoration

Ergon Energy suggested that its safety net targets be amended to:

- remove the 'Fully restored within 24 hours' threshold from the regional centre category
- replace the 'Fully restored within 48 hours' threshold with 'Less than 1 MVA after 48 hours' in the rural areas category.

The QCA considers these amendments may not be necessary at this stage. It is not clear that removing the full restoration thresholds would result in a discernible change in network security, customer reliability outcomes or costs, at least in the short to medium term. It is also unclear whether this would have any effect on supply restoration times in practice. The QCA has formed this view for two key reasons.

⁷³ Energex and Ergon Energy, sub. 4, p. 13.

⁷⁴ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 11.

⁷⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 10.

Firstly, the safety net targets are probabilistic, rather than deterministic, criteria. This means that the criteria serve as triggers to investigate potential investment, rather than triggers for actual investment. Energex and Ergon Energy use performance against these criteria to identify potential constraints. Any decisions to invest in solutions that address those constraints are subject to risk and engineering assessments, and economic cost–benefit analysis. Ergon Energy has noted that where the risk of failing to meet the restoration targets is identified as being very low probability, investment to further mitigate the risk would generally not be recommended, consistent with industry best practice.⁷⁶ The probabilistic criteria recognise that building and operating the network to guarantee compliance with the safety net targets may not always represent an economically efficient outcome when considering the risk of non-compliance.

Secondly, the distribution authorities establish an obligation to meet the safety net targets 'to the extent reasonably practicable'.⁷⁷ This further recognises that meeting the targets may not be possible in all situations due to a range of factors. For example, due to weather conditions, access limitations, or safety concerns supply cannot always be restored within the target timeframes. This recognises that, while undesirable, long restoration times may be reasonable and unavoidable in some circumstances.

In the QCA's view, removing the full restoration targets would simply reinforce the accepted understanding that achieving these targets will not always be possible for reasons beyond the control of Ergon Energy, and that failing to meet the targets for full restoration cannot always be prevented through efficient and prudent investment or operating decisions.

Energex and Ergon Energy have acknowledged these factors and suggested that:

An alternative approach could retain our current targets and hence the existing obligations in place, but agree a formal recognition with DNRME that specific factors ... are beyond reasonably practicable in their application to the criteria.⁷⁸

The QCA considers that this alternative approach may have merit; however, the probabilistic criteria and requirement to comply with the targets 'to the extent reasonably practicable', appear to already offer sufficient recognition that some instances of non-compliance are reasonable.

In response to the draft report, Energex and Ergon Energy acknowledged the QCA's position and noted that the term 'to the extent reasonably practicable' could be open to interpretation. Energex and Ergon Energy stated that the businesses will liaise with DNRME to seek clarity on the intent of the definition.⁷⁹

The QCA considers that it is appropriate to retain the thresholds for full restoration in Ergon Energy's distribution authority.

Ergon Energy also proposed to include indicative customer numbers in the expression of its restoration targets, for consistency with the Energex restoration targets. The QCA considers that these amendments are reasonable.

Definition of a 'larger centre'

Ergon Energy proposed to include a new definition in clause 1.2 of its distribution authority to define a 'larger centre' as 'a town/city with a population of 6,000 or more'. The QCA considers it

⁷⁶ Ergon Energy, *Distribution annual planning report 2018–19 to 2022–23*, p. 73.

⁷⁷ Specifically, cl. 10.2(a) requires that the DNSPs will design, plan and operate the supply network to ensure, to the extent reasonably practicable, that it achieves the safety net targets as specified.

⁷⁸ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 10.

⁷⁹ Energex and Ergon Energy, sub. 5, pp. 5–6.

reasonable to explicitly define this term, given that the definition of 'regional centre' makes reference to 'larger centre'.

Ergon Energy has advised that, given the current lack of a formal definition, it has internally applied the 6,000 population threshold in determining 'regional centres' for the purposes of the safety net.⁸⁰ As such, including this definition in the distribution authority will simply formalise current practice rather than change the classification of areas for the purposes of the safety net targets.

The QCA considers it reasonable to include Ergon Energy's suggested definition of 'larger centre' at clause 1.2 of its distribution authority, to provide greater certainty and transparency in the application of the safety net provisions.

Excluded interruptions

The current distribution authority for Energex provides for a range of excluded interruptions when determining compliance with the safety net targets. In contrast, Ergon Energy's corresponding obligations do not identify any exclusions. Ergon Energy suggested that its safety net requirements should be aligned with those of Energex, and it proposed a list of excluded interruptions (see above).

Ergon Energy noted that its proposed exclusions are intended to supplement its list of credible contingency events and provide a comprehensive view of events to be considered when applying the safety net criteria.⁸¹

The QCA's view is that the proposed exclusions are largely reasonable and could be incorporated into Ergon Energy's distribution authority with no material impact on safety net outcomes. We understand that not all events listed as proposed exclusions would be associated with N-1/credible contingency events for the purposes of the safety net. Nonetheless, formally identifying excluded interruptions that are beyond the reasonable control of Ergon Energy is appropriate and would improve certainty and transparency in the application of the safety net targets.

The QCA notes there are some inconsistencies between Ergon Energy's proposed exclusions and those currently applying to Energex. Energex and Ergon Energy acknowledged this and submitted that the following exclusions should be added to Energex's distribution authority for consistency:

- an interruption occurring during a state or federally declared natural disaster event beginning on the day of the event through to declaration of the end of the emergency condition
- an interruption occurring in a network where planned works are being undertaken, which materially impacts the outage risk profile of that network
- an interruption caused by a retailer's actions.⁸²

The QCA considers that adopting Energex and Ergon Energy's proposed excluded interruptions is reasonable and would align the exclusion criteria across the two businesses. We note that Energy Queensland's proposed exclusions for the purposes of the safety net do not reconcile with the MSS exclusions. The QCA does not consider that exact alignment between the safety net and MSS

⁸⁰ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 6.

⁸¹ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 7.

⁸² Energex and Ergon Energy, sub. 5, p. 5.

exclusions is necessary given the distinct purposes of the two frameworks. Nonetheless, Energy Queensland may wish to consider whether such alignment would be appropriate in future.

Recommendation 4

- The QCA recommends that Ergon Energy's service safety net provisions should be amended as set out in Appendix F to:
 - (a) include Ergon Energy's proposed definition of a 'larger centre' at clause 1.2 of the distribution authority
 - (b) include Ergon Energy's proposed list of excluded interruptions as a new clause 10.3 of the distribution authority.
 - (c) amend Energex's list of exclusions at clause 10.3 of its distribution authority to reflect recommended revisions to Ergon Energy's corresponding exclusions.

5 EFFECTIVENESS OF THE NETWORK RELIABILITY FRAMEWORK

The QCA has considered the effectiveness of the MSS framework as a mechanism to achieve network reliability outcomes, as required by the Minister's direction. We consider that the MSS have been effective in delivering improved distribution network reliability. The shift from deterministic to probabilistic network security and planning criteria and the relaxation of the MSS limits in 2014 have resulted in the focus of the DNSPs shifting from improving to maintaining reliability, thereby alleviating costs pressures on consumers.

In our view, Queensland's network reliability arrangements, including the MSS limits, are a substantive component of the regulatory framework, and serve a purpose that is not achieved by the STPIS alone. Nonetheless, we consider there is scope to reduce the compliance burden of maintaining two reliability frameworks by more closely aligning the data requirements of the MSS with the STPIS.

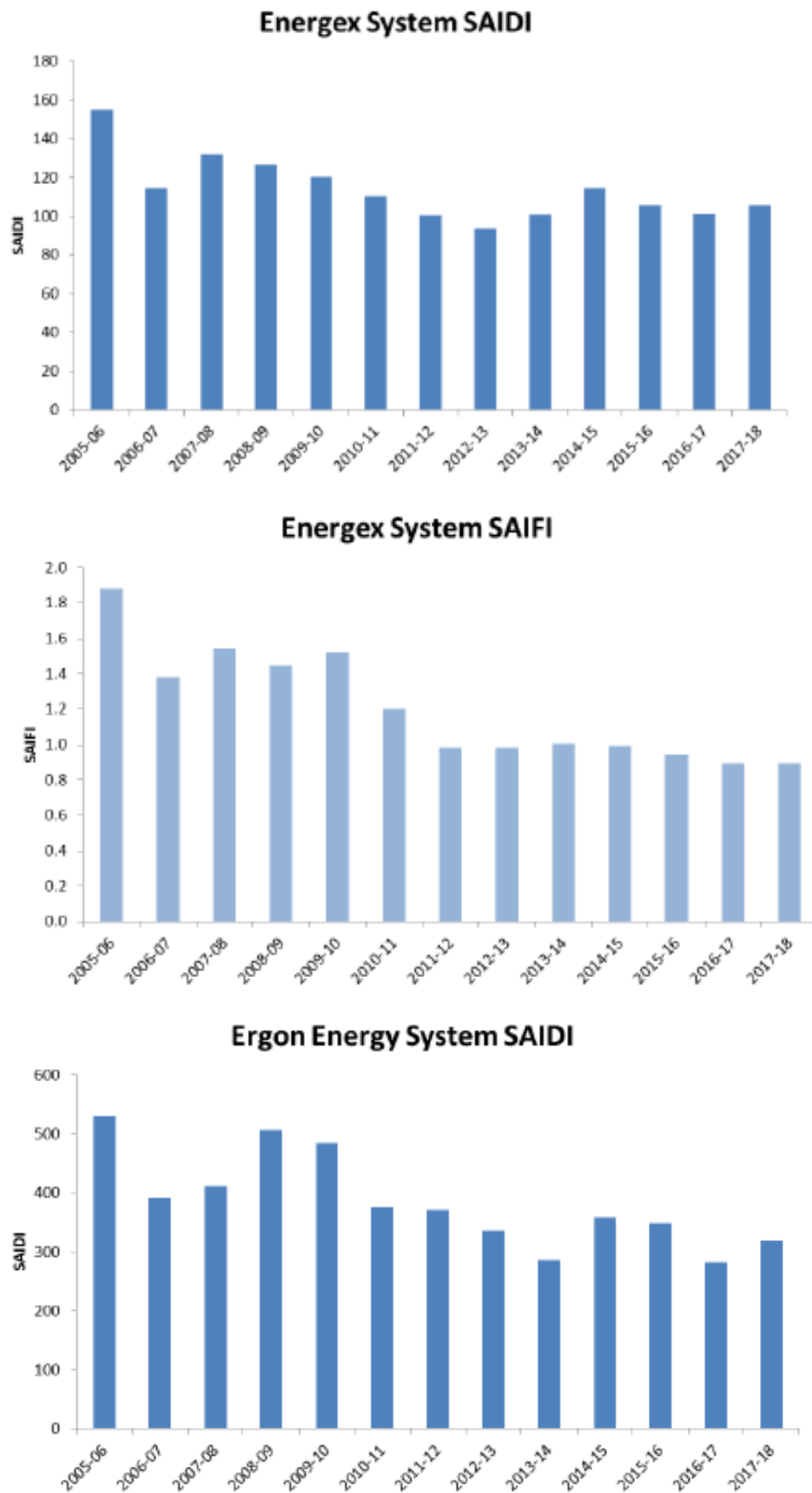
5.1 Effectiveness of the MSS

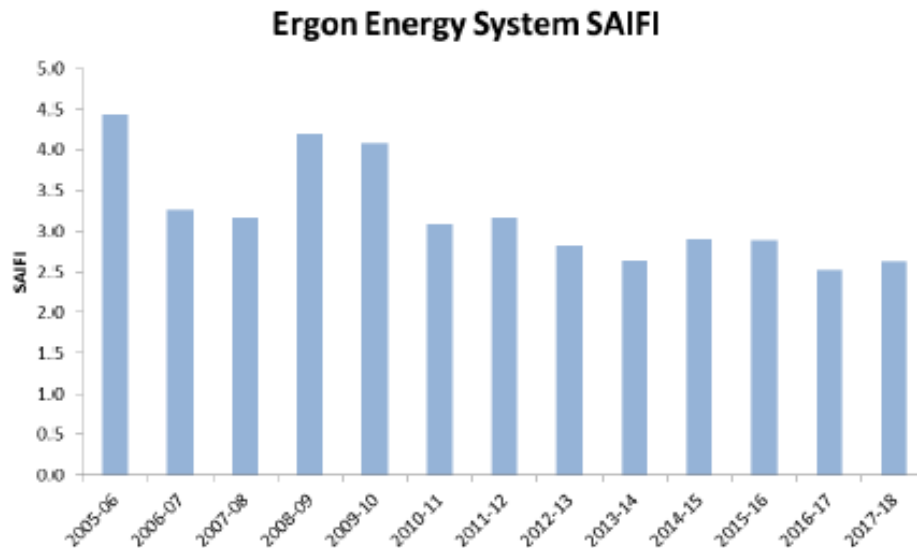
In assessing the effectiveness of the MSS framework, the QCA has examined whether the MSS has been successful in delivering improved distribution network reliability outcomes in Queensland.

As outlined in Figure 4, overall network reliability has improved for both Energex and Ergon Energy. Specifically, since 2005–06, Energex's overall system SAIDI and SAIFI improved by 32 per cent and 52 per cent respectively, when compared to the 2017–18 results. Ergon Energy's overall system SAIDI and SAIFI has improved by 40 per cent and 40.7 per cent respectively, when compared to the 2017–18 results.⁸³ The overall network reliability improvements are generally reflected across the different feeder types for which Energex and Ergon Energy's MSS limits are set (discussed in section 2.2.1). While there is some annual variation in performance, this improvement in reliability outcomes generally appears to correspond with the implementation of the MSS framework in 2005–06.

⁸³ Energex and Ergon Energy, sub. 4, pp. 13–14.

Figure 4 Overall network SAIDI and SAIFI performance





Source: Energex and Ergon Energy, *Customer Reliability Strategy 2020–25*, January 2019, pp. 6–7.

Energex and Ergon Energy stated that reliability improvements are the result of targeted network expenditure in previous periods and the implementation of improved operational capability and practices.⁸⁴ For the 2010–15 regulatory control period, the AER approved \$308.3 million and approximately \$93 million towards reliability improvement works for Energex and Ergon Energy respectively. Energex and Ergon Energy stated that expenditure sought to bring about step change on the average reliability of the network in order to meet MSS SAIDI/SAIFI limits or to further improve performance.⁸⁵ The 2015–20 regulatory control period resulted in significant reductions to reliability improvement expenditure. Energex and Ergon Energy noted this was the result of developments that included flat-lining of the MSS limits to 2010–11 levels and the DNSPs achieving reliability performance consistent with the MSS limits (with the exception of long rural SAIDI for Ergon Energy).⁸⁶

Energex and Ergon Energy have processes in place to monitor compliance with the MSS limits. Noting the inherent statistical variability in reliability outcomes, both DNSPs set internal targets that are more stringent than the MSS limits to minimise the risk of non-compliance.⁸⁷ For Energex, forecasts of network performance are carried out. These forecasts are then compared to the MSS limits and where an unfavourable gap between the MSS limits and forecast of network performance exists, further network analysis is undertaken and programs are implemented to target areas where maximum reliability benefit can be achieved for minimum capital expenditure.⁸⁸

Energex and Ergon Energy stated that the MSS has proved its effectiveness as a measure to improve reliability outcomes and that network performance has improved over the past decade

⁸⁴ Energex and Ergon Energy, sub. 4, p. 14.

⁸⁵ Energex, *Strategic proposal, Worst performing feeder 2020–25*, January 2019, p. 5; Ergon Energy, *Strategic proposal, Worst performing feeder 2020–25*, p. 5.

⁸⁶ Energex, *Strategic proposal, Worst performing feeder 2020–25*, January 2019, p. 5; Ergon Energy, *Strategic proposal, Worst performing feeder 2020–25*, p. 5.

⁸⁷ Further detail on this process can be found in Energex and Ergon Energy's DAPRs: Energex, *Distribution Annual Planning Report 2018–19 to 2022–23*, December 2018, p. 130; Ergon Energy, *Distribution Annual Planning Report 2018–19 to 2022–23*, December 2018, p. 132.

⁸⁸ Energex, *Distribution Annual Planning Report 2018–19 to 2022–23*, December 2018, p. 130.

as a result of an improved focus on customer experience driven by the current reliability framework.⁸⁹ No other stakeholders commented directly on the effectiveness of the MSS framework as a mechanism to achieve network reliability outcomes.

In our view, the MSS framework appears to have functioned effectively as a mechanism to achieve improved network reliability outcomes. Overall improvement in reliability outcomes appears to generally correspond with the implementation of the MSS framework in 2005–06. Statements by Energex and Ergon Energy further demonstrate that the MSS framework is an important consideration in reliability-related business decisions that ultimately impact reliability outcomes.

The QCA acknowledges improvements in reliability outcomes over recent years is likely the result of a combination of factors. The MSS is only one component of the broader network reliability arrangements set out in the distribution authority, which include worst performing feeder improvement programs and service safety net targets.⁹⁰ These components are also likely to contribute to overall reliability outcomes. For example, the deterministic network security criteria (N-1) introduced in 2005 drove significant capital expenditure in the years following their introduction and likely had a positive impact on SAIDI and SAIFI performance. The AER's STPIS, introduced in 2010–11, also provides financial incentives for Energex and Ergon Energy to maintain and improve service performance.

Notwithstanding these other reliability mechanisms, the MSS framework has been an important driver of the DNSPs' reliability-related investment and operational decisions, and has contributed to the improved reliability outcomes experienced since its implementation.

5.2 Network reliability arrangements and the STPIS

The Minister's direction requires us to examine Queensland's network reliability arrangements, taking into account the functions performed by the STPIS. Since 2010, Energex and Ergon Energy have been subject to both the network reliability arrangements⁹¹ and STPIS.

The current network reliability arrangements represent a set of obligations and standards that form conditions of the DNSPs' distribution authorities. There are no direct financial incentives attached to compliance with the network reliability arrangements.

In contrast, the STPIS complements the revenue cap form of control and is intended to temper the incentive for DNSPs to reduce costs at the expense of service quality and reliability. The STPIS rewards DNSPs for improving service quality and reliability, and penalises for allowing performance to deteriorate, with reference to predetermined performance targets. The value of the incentives provided by the STPIS are linked to the value that customers place on supply reliability (VCR). Rewards for better-than-target performance are recovered from customers through increased network revenues, and penalties for below-target performance are borne by the DNSPs and passed back to customers as a reduction in network charges.

⁸⁹ Energex and Ergon Energy, sub. 4, pp. 13, 14.

⁹⁰ The worst performing feeder obligations impact reliability outcomes of poor performing feeders, not average reliability outcomes, while service safety net targets are the criteria that underpin network augmentation and may indirectly impact reliability outcomes (Energex and Ergon Energy, sub. 4, p. 14).

⁹¹ In this context, 'network reliability arrangements' are taken to include the MSS limits, service safety net targets, and worst performing feeder improvement obligations as set out in Energex and Ergon Energy's distribution authorities.

Both schemes appear to provide some common incentives to deliver a reliable supply, particularly with regard to SAIDI and SAIFI performance. However, unlike the STPIS, the network reliability arrangements:

- set a minimum level of reliability, which DNSPs must use all reasonable endeavours to meet;
- represent a binding regulatory obligation, which allows the DNSPs to seek regulated revenue allowances that are sufficient to meet the reliability obligations; and
- include additional requirements to address worst performing feeders and network security of supply.

Importantly, the network reliability arrangements allow the Queensland Government a level of direct policy control over reliability that the STPIS does not. On this point, we note that the COAG Energy Council has recognised there is a role for jurisdictions to determine how reliability requirements will be set in their jurisdiction.⁹²

Setting a minimum level of reliability

The network reliability arrangements establish MSS limits that represent binding minimum levels of reliability that DNSPs must aim to achieve. Systemic failure to meet the MSS limits represents a breach of the DNSP's distribution authority, which may result in disciplinary action or the imposition of a pecuniary civil penalty.⁹³

On the other hand, the STPIS establishes performance targets based on a rolling five-year average of actual performance. As a result, when average performance deteriorates, STPIS targets follow and a new, lower level of target reliability is established. As such, notwithstanding the financial incentives to maintain performance that it provides, the STPIS alone does not ensure that an absolute minimum level of reliability will be delivered. This distinction was noted by the ENCAP review panel in its 2011 report, which recommended that the MSS limits should remain in place alongside the STPIS. The panel noted:

The Panel is of the view that the MSS are simply that, the minimum reliability customers can expect in relation to their electricity supply. Whilst STPIS provides a financial incentive for the businesses for performance against reliability indicators, it is not in itself a guarantee of acceptable reliability levels for customers.⁹⁴

The IRPNC also noted that the MSS should represent a minimum level of acceptable reliability and recommended that the MSS be transferred from the Electricity Industry Code to the DNSPs' distribution authorities—a recommendation that was actioned by the Queensland Government in 2014.⁹⁵

Securing funding to provide a minimum level of reliability

As discussed in section 2.2.2, improving network reliability performance generally requires DNSPs to incur additional capital and/or operating costs. Energex and Ergon Energy are required to submit their capital and operating expenditure forecasts to the AER for approval as part of their regulatory proposal.

⁹² Council of Australian Governments (COAG) Energy Council, *Response to the Australian Energy Market Commission's Review of the National Framework for Distribution Reliability and Review of the National Framework for Transmission Reliability*, December 2014, p. 4.

⁹³ Department of Energy and Water Supply, *Performance against minimum service standards (MSS) by Energex and Ergon Energy for the 2016–17 financial year*, p. 2.

⁹⁴ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, 2011, p. 46.

⁹⁵ IRPNC, *Electricity network costs review*, final report, December 2012, p. 43.

The NER requires that the proposed capital and operating allowances include expenditure to comply with all applicable regulatory obligations.⁹⁶ Energex and Ergon Energy are therefore able to seek regulatory allowances to meet the efficient costs of complying with their obligations under the network reliability arrangements. As required by the NER, the AER must approve these costs if it is satisfied that they reasonably reflect the prudent and efficient costs of meeting such obligations.⁹⁷

The STPIS does not include any binding obligations to meet performance targets, and the costs of reliability improvements undertaken to outperform STPIS targets cannot be funded through *ex ante* expenditure allowances. Energex and Ergon Energy have stated that the regulatory proposals for 2020–2025 do not include any expenditure to meet STPIS outcomes and STPIS is not driving any expenditure or customer reliability improvements.⁹⁸ In the absence of regulatory obligations to deliver a minimum level of reliability (the case if the network reliability arrangements were removed), the NER limits DNSPs to seeking prudent and efficient costs to maintain reliability, rather than improve reliability.⁹⁹ While this is not an issue in the current environment where customers are generally satisfied with reliability levels, it is possible this issue could arise in the future.

Additional requirements

The network reliability arrangements include worst performing feeder improvement obligations. These obligations target improvements towards poor-performing feeders, which may not be prioritised when targeting an average level of feeder reliability only.

The AER's final decision on the STPIS and Distribution Reliability Measures Guideline addresses the issue of poor-performing feeders through the implementation of new reporting arrangements that identify customers who experience an inadequate level of reliability.¹⁰⁰ However, along with reporting requirements, the network reliability arrangements include additional obligations, in that they require Energex and Ergon Energy to implement a program to improve the reliability of the worst performing distribution feeders.¹⁰¹

The network reliability arrangements also prescribe probabilistic network planning standards in the form of the service safety net targets to address network security.¹⁰² These targets have a significant and direct impact on network planning and investment decisions.

Stand-alone power systems

The AEMC recently conducted a review of the regulatory arrangements for customers moving from grid-connected supply to stand-alone power systems provided by DNSPs. A stand-alone power system (SAPS) is an electricity supply arrangement that is not physically connected to the national electricity market, and includes 'microgrids'.

⁹⁶ Clauses 6.5.6(a)(2) and 6.5.7(a)(2) of the NER.

⁹⁷ Clauses 6.5.6(c) and 6.5.7(c) of the NER.

⁹⁸ Energex and Ergon Energy, sub. 4, pp. 14–15.

⁹⁹ Clauses 6.5.6(a)(3) and 6.5.7(a)(3) of the NER.

¹⁰⁰ AER, *Amendment to the Service Target Performance Incentive Scheme*, final decision, November 2018, pp. 31–32.

¹⁰¹ Clause 11.2(b) of the distribution authorities.

¹⁰² Clause 10 of the distribution authorities.

The AEMC's report included positions on extending jurisdictional reliability standards to cover DNSP-led SAPS.¹⁰³

The Clean Energy Council expressed support for the AEMC's draft recommendation that relevant jurisdictional instruments be amended to implement an appropriate regime of energy-specific consumer protections (including reliability standards) for customers served by a microgrid supply.¹⁰⁴ The Clean Energy Council recommended that a minimum service standard should be set for SAPS, which should be at least as high as the standard for a long rural feeder, noting the potential benefits and cost savings for the use of SAPS by DNSPs.¹⁰⁵

QFF asked the QCA to consider the role of future legislation in specifying (or not) the reliability standards associated with SAPS. It did not believe future SAPS needed to adhere to existing reliability standards that are currently applied to the networks (within the NEM).¹⁰⁶

While the QCA does not consider it appropriate to consider potential amendments to Queensland's network reliability arrangements in respect of SAPS at this time, there may be merit, in future, for the Minister to consider the extension of Queensland's arrangements in this regard.

5.3 QCA conclusions

The QCA considers the MSS framework to be an important mechanism in achieving network reliability outcomes. The network reliability arrangements, including the MSS limits, perform functions that are not captured by the STPIS.

Nonetheless, the QCA considers there is scope to reduce compliance costs associated with reporting two sets of reliability performance data by more closely aligning the MSS definitions and exclusions with the STPIS. The QCA's findings on these matters are outlined in section 2.3.

¹⁰³ AEMC, *Review of the Regulatory Frameworks for Stand-alone Power Systems—Priority 1*, draft report, 18 December 2018, pp. 121–22.

¹⁰⁴ The QCA notes the draft recommendations are consistent with the AEMC's final recommendations on this matter. AEMC, *Review of the Regulatory Frameworks for Stand-alone Power Systems—Priority 1*, final report, 30 May 2019.

¹⁰⁵ Clean Energy Council, sub. 1, pp. 1–2.

¹⁰⁶ QFF, sub. 2, p. 3.

GLOSSARY

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CBD	central business district
CCIQ	Chamber of Commerce and Industry Queensland
COAG	Council of Australian Governments
Code	Electricity Distribution Network Code (Queensland)
DAPR	Distribution annual planning report
DNSP	Distribution network service provider
DRMG	Distribution Reliability Measures Guideline
DNRME	Department of Natural Resources, Mines and Energy (Queensland)
EDSD	Electricity Distribution and Service Delivery
ENCAP	Electricity Network Capital Program Review 2011
Energex	Energex Limited
Energy Queensland	Energy Queensland Limited
Ergon Energy	Ergon Energy Corporation Limited
ESCOSA	Essential Services Commission of South Australia
HV	high voltage
GSL(s)	guaranteed service levels
IPART	Independent Pricing and Regulatory Tribunal
IRPNC	Independent Review Panel on Network Costs
kV	kilovolts
MED	major event day
MSS	minimum service standards
MVA	mega volt amps
NEM	National Electricity Market
NER	National Electricity Rules
NMI	National Metering Identifier
QCA	Queensland Competition Authority
QEUN	Queensland Electricity Users Network
QFF	Queensland Farmers Federation
SA	South Australia
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index

SAPS	stand-alone power systems
SCADA	supervisory control and data acquisition
STPIS	Service Target Performance Incentive Scheme
VCR	value of customer reliability
WPF	worst performing feeder

APPENDIX A: MINISTERIAL DIRECTION

ELECTRICITY ACT 1994

Section 253AA

MINISTER'S DIRECTION NOTICE

Pursuant to section 253AA of the *Electricity Act 1994* (the Act), I hereby direct the Queensland Competition Authority (the QCA) to provide a publicly available written report to me (the Report) setting out recommended reliability standards for Energex and Ergon Energy NEM connected networks and for Ergon Energy's Mt Isa-Cloncurry network for the period 1 July 2020 until 30 June 2025.

The following are the Terms of Reference of this direction:

Terms of Reference

1. In accordance with section 253AA of the Act, the QCA is to provide a written report on recommended reliability standards for Energex and Ergon Energy for the period 1 July 2020 until 30 June 2025.
2. The report should include recommendations on the following:
 - a. the System Average Interruption Frequency Index (SAIFI) limits and the System Average Interruption Duration Index (SAIDI) limits which Ergon and Energex are to comply with for the period 1 July 2020 to 30 June 2025;
 - b. whether the definitions and exclusions for SAIFI and SAIDI included in Energex's and Ergon Energy's distribution authorities should be amended to align with the definitions of SAIFI and SAIDI used in the Australian Energy Regulator's Service Target Performance Incentive Scheme (STPIS);
 - c. whether the Worst Performing Feeder components of the Ergon Energy and Energex distribution authorities should be aligned so they are treated consistently between both distribution authorities; and
 - d. whether the Safety Net component of the Ergon Energy distribution authority should be amended.
3. The report should clearly explain the reasoning for all recommendations.
4. Additionally, the report should:
 - a. assess how effectively the MSS framework has functioned as a mechanism to achieve network reliability outcomes; and
 - b. examine whether Queensland's network reliability arrangements should be reformed, taking into account the functions performed by the STPIS.
5. In undertaking its review, and making its findings, the QCA will have regard to:
 - a. the amount customers are willing to pay to increase reliability above current levels;
 - b. the past performance of Energex and Ergon Energy in terms of reliability; and
 - c. the financial and pricing consequences resulting from any changes to reliability standards.
6. In reaching its findings, the QCA should:

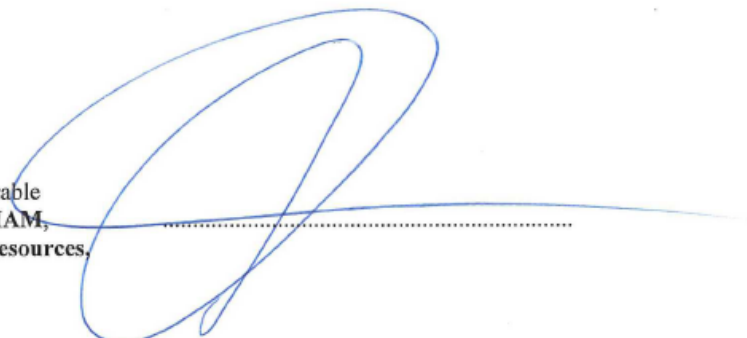
- a. undertake stakeholder consultation with relevant consumer groups, electricity distributors and any other stakeholders the QCA deems appropriate;
- b. in considering customers' willingness to pay to increase reliability above current levels, have regard to the customer engagement and research undertaken by Energex and Ergon Energy; and
- c. consider the previous reviews of electricity distribution reliability levels undertaken in Queensland since 2004.

Timing of report

7. The QCA is to provide a Statement of Work detailing key tasks, resources and relevant information needed to prepare the Report by 31 January 2019.
8. The QCA is to deliver its Report to me according to the following schedule:
 - a. draft finding report 1 May 2019; and
 - b. final report 30 June 2019.
9. The draft report and final report should be published on the QCA's website on the same dates it is provided to me.

DATED this 30th day of January 2019.

SIGNED by the Honourable
DR ANTHONY LYNHAM,
Minister for Natural Resources,
Mines and Energy



APPENDIX B: SUBMISSION LIST

The QCA received the following submissions in response to its discussion paper and draft report on reliability standards for Energex and Ergon Energy for 2020–25. The submission numbers below are used in this report for referencing purposes. The submissions are available on the QCA website.

Submissions

<i>Stakeholder</i>	<i>Sub. number</i>	<i>Date submitted</i>
Clean Energy Council	1	22 March 2019
Queensland Farmers Federation	2	22 March 2019
Queensland Electricity Users Network	3	25 March 2019
Energex and Ergon Energy	4	27 March 2019
Energex and Ergon Energy	5	23 May 2019

APPENDIX C: RECOMMENDED DEFINITIONS AND EXCLUSIONS FOR MSS

Clause	Distribution Authority	Existing drafting	Recommended drafting
cl. 1.2, definition of 'long rural feeder'	Ergon Energy	means a feeder which is not an urban feeder or isolated feeder and has a total feeder route length of greater than 200 km.	means a feeder which is not an urban feeder or isolated feeder, with a total feeder route length equal to, or greater than, 200 km.
cl. 1.2, definition of 'urban feeder'	Energex	means a feeder which is not a rural feeder or CBD feeder and has an annual actual maximum demand per total feeder route length of greater than 0.3 MVA/km.	means a feeder which is not a CBD feeder and has a three-year average maximum demand over the three-year average feeder route length greater than 0.3 MVA/km.
cl. 1.2, definition of 'urban feeder'	Ergon Energy	means a feeder that has an annual actual maximum demand per total feeder route length of greater than 0.3 MVA/km.	means a feeder that has a three-year average maximum demand over the three-year average feeder route length greater than 0.3 MVA/km.
cl. 1.2, definition of 'SAIDI'	Both	means System Average Interruption Duration Index.	means System Average Interruption Duration Index and is calculated as the sum of the duration of each interruption (in minutes) divided by the customer base, recorded for each feeder type.
cl. 1.2, definition of 'SAIFI'	Both	means System Average Interruption Frequency Index.	means System Average Interruption Frequency Index and is calculated as the total number of interruptions divided by the customer base, recorded for each feeder type. SAIFI is expressed per 0.01 interruptions.
cl. 1.2, definition of 'distribution customer'	Both	N/A	means a customer with an active account and with an active National Metering Identifier, excluding unmetered customers.
cl. 1.2, definition of 'customer base'	Both	N/A	means the number of distribution customers at the start of the relevant period plus the number of distribution customers at the end of the relevant period, divided by two.
cl. 1.2, definition of 'larger centre'	Ergon Energy	N/A	means a town/city with a population of 6,000 or more people.
cl. 9.3(a)	Both	an interruption of a duration of one minute or less.	an interruption of a duration of three minutes or less.
cl. 9.3(b)(iii)	Both	automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards.	automatic load shedding due to the operation of under frequency relays following the occurrence of a power system under-frequency condition.

cl. 9.3(b)(v)	Both	a direction by a police officer or another authorised person exercising powers in relation to public safety.	Delete. Insert new cl. 9.3(e): an interruption caused or extended by a direction from a police officer or another authorised person exercising powers in relation to public safety, provided that a fault in, or the operation of, the network did not cause, in whole or part, the event giving rise to the direction.
new replacement cl. 9.3(b)(v)	Both	N/A	a failure of transmission connection assets except where the interruptions were due to: (A) actions, or inactions, of the distribution entity that are inconsistent with good industry practice; or (B) inadequate planning of transmission connections and the distribution entity is responsible for transmission connection planning.
cl. 9.3(d)	Both	an interruption caused by a customer's electrical installation or failure of that electrical installation.	an interruption caused by a customer's electrical installation, a customer's request to be disconnected to isolate their installation, or failure of that electrical installation, if power is still available at the point of supply.

APPENDIX D: ASSESSMENT OF DEFINITIONS AND EXCLUSIONS FOR SAIFI AND SAIDI

SAIFI and SAIDI definitions

Energex and Ergon Energy's distribution authorities do not expressly define how SAIFI and SAIDI are to be calculated, although they do specify interruptions that are to be excluded when determining whether the SAIFI and SAIDI limits have been exceeded (these exclusions are discussed further below).

In contrast, the AER's STPIS includes more substantive definitions that set out how SAIFI and SAIDI are to be calculated. It also includes a number of supporting definitions and notes that provide additional detail about the calculation of these measures.¹⁰⁷

Energex and Ergon Energy have proposed including the following definitions for SAIFI and SAIDI in the distribution authorities:

- SAIDI (System Average Interruption Duration Index) is calculated as the sum of the duration of each sustained customer interruption (in minutes) divided by the customer base, recorded for each feeder type.
- SAIFI (System Average Interruption Frequency Index) is calculated as the total number of sustained customer interruption divided by the customer base, recorded for each feeder type. SAIFI is expressed per 0.01 interruptions.
- Customer base is defined as the number of distribution customers at the start of the relevant period plus the number of the distribution customers at the end of the relevant period, divided by two.
- A distribution customer for the purposes of MSS and STPIS reporting is defined as a customer with an active account and with an active National Metering Identifier (NMI) i.e. inactive accounts are excluded.¹⁰⁸

The definitions proposed by Energex and Ergon Energy are adapted from the STPIS (with some minor differences), with the exception of 'distribution customer', which they said has instead been adapted from the AER's annual reporting regulatory information notice.^{109,110} The QCA notes that the STPIS does not specifically define the term 'distribution customer', while the National Energy Rules includes a definition for the term that is broader than has been proposed by Energex and Ergon Energy.

In the absence of substantive definitions for SAIFI and SAIDI in the distribution authorities, Energex and Ergon Energy said they have used these definitions as a default for MSS purposes and that their proposed amendments would formalise their current work practices.¹¹¹

The QCA supports Energex and Ergon Energy's proposal that the distribution authorities should be amended to include substantive definitions for SAIFI and SAIDI that set out how these measures are to be calculated.

¹⁰⁷ See AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme, version 2.0*, November 2018, pp. 25–26.

¹⁰⁸ Energex and Ergon Energy, sub. 4, pp. 16–18.

¹⁰⁹ Energex and Ergon Energy, sub. 4, pp. 17–18; Energex and Ergon Energy, sub. 5, p. 6.

¹¹⁰ The AER collects information from DNSPs each year (as specified in a 'regulatory information notice') for various purposes, including developing performance reports. This information includes SAIFI and SAIDI performance data.

¹¹¹ Energex and Ergon Energy, sub. 4, pp. 16–17.

This will provide increased certainty and transparency about these calculations. The QCA considers the STPIS definitions are an appropriate basis for how the distribution authorities should be amended, noting these definitions also largely mirror the corresponding definitions included in the Distribution Reliability Measures Guideline.¹¹²

However, these definitions should be adjusted to reflect the terminology and language used in the distribution authorities (see Appendix C for the QCA's recommended amendments). For example, the QCA has not incorporated 'sustained customer interruptions' as it is not a concept used in the distribution authorities. Instead, interruptions that are not sustained interruptions (i.e. interruptions of a duration less than the prescribed threshold) are excluded from the MSS limits as part of the list of exclusions (cl. 9.3 of the distribution authorities).

With regard to the proposed definitions for 'distribution customer' and 'customer base', which are to be used in conjunction with the SAIFI and SAIDI definitions, Energex and Ergon Energy stated these reflect their current work practices. That is, each DNSP already excludes customers who do not have an active NMI from its SAIFI and SAIDI calculations for MSS purposes. Accordingly, they considered there would be no impact on their customers or reporting measures resulting from these proposed changes.¹¹³

Energex and Ergon Energy proposed that these definitions should be additional to, and not replace, the existing definition of 'customer' that is used in the distribution authorities, which is broader and reflects the definition used in the Electricity Act. Energex and Ergon Energy said the current definition of 'customer' is applied in different ways across different groups within both DNSPs, but that the proposed new definition of 'distribution customer' would provide a more concise and descriptive definition for reporting purposes.¹¹⁴ Similarly, they considered the definitions of 'customer' and 'distribution customer' used in the National Electricity Rules also do not provide sufficient detail for the purposes of measuring reliability.¹¹⁵

In our draft report, the QCA sought further information from Energex and Ergon Energy about how de-energised NMIs would be treated under Energex and Ergon Energy's proposed definition and whether any further amendments to the definition are needed for clarity. This was due to statements by the AER that indicated the definition of 'distribution customer' under the AER's annual reporting regulatory information notice is meant to include both energised and de-energised NMIs^{116,117} and because the equivalent definition in the Distribution Reliability Measures Guideline also refers to it including 'energised and de-energised connection points'.¹¹⁸ In response, Energex and Ergon Energy said that they treat de-energised NMIs as an inactive customer and therefore they are not currently counted for the purposes of reliability reporting, including for their STPIS reporting. On that basis, Energex and Ergon Energy considered that de-energised NMIs do not require specific mention for reliability reporting measures.¹¹⁹

The QCA recommends the inclusion of new definitions for 'customer base' and 'distribution customer' based on the definitions proposed by Energex and Ergon Energy. This recommendation is based on the understanding that these definitions reflect Energex and Ergon Energy's current MSS reporting practices and that, as such, this would not exclude any additional customers. The QCA has made some minor drafting

¹¹² See AER, *Distribution Reliability Measures Guideline*, November 2018, p. 6.

¹¹³ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 13–14; Energex and Ergon Energy, sub. 5, p. 6.

¹¹⁴ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 13.

¹¹⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 15.

¹¹⁶ AER, *Economic benchmarking RIN for distribution network service providers, Instructions and Definitions*, November 2013, p. 30.

¹¹⁷ AER, *Explanatory statement, Regulatory information notices to collect information for economic benchmarking*, November 2013, pp. 39–40.

¹¹⁸ AER, *Distribution Reliability Measures Guideline*, November 2018, p. 6.

¹¹⁹ Energex and Ergon Energy, sub. 5, p. 7.

changes to these definitions as compared to those proposed by Energex and Ergon Energy, such as not including a reference that the definition of distribution customer applies for STPIS purposes, as this is not a matter that can be dealt with under the distribution authorities. Further, the QCA has incorporated Energex and Ergon Energy's request for the definition to specifically exclude unmetered customers (discussed further in Table D1).

In addition to the above definitions, Energex and Ergon Energy have also proposed replicating within the distribution authorities the 'notes' that are included in the STPIS.¹²⁰

While these notes might be appropriate in the context of the STPIS, the QCA is concerned about introducing uncertainty within the distribution authorities, particularly given these are legal instruments that set the conditions on which the DNSPs are licensed to supply electricity. It is unclear what status and effect these notes will have within the context of the distribution authorities. To the extent that Energex and Ergon Energy propose these notes be included within their distribution authorities, the QCA considers these should be included as substantive provisions (e.g. definitions or clauses) within the distribution authorities. If these notes are intended to reflect existing substantive provisions, then their inclusion is not necessary and introducing them adds complexity, and may cause uncertainty and have unintended consequences in the interpretation and application of the distribution authorities. This should be avoided, given the importance of the MSS obligations to Energex and Ergon Energy, and their customers.

The following table sets out the QCA's positions on Energex and Ergon Energy's proposed notes supporting exclusions for MSS.

Table D1 QCA positions on Energex and Ergon Energy's proposed notes supporting exclusions for MSS

<i>Proposed note</i>	<i>QCA position</i>
Unmetered street lighting supplies are excluded. Other unmetered supplies should be excluded from the calculation of reliability measures, except where a DNSP is unable to identify the unmetered supplies from its historical performance data.	<p>Energex and Ergon Energy said this change aligns to the STPIS and represents the current work practices of the DNSPs. They confirmed that each already excludes unmetered street lighting from its SAIFI and SAIDI calculations because they do not meet the definition of 'distribution customer' that it has been applying in practice (i.e. excluding customers without a NMI).¹²¹ Energex and Ergon Energy proposed this note be incorporated by including drafting within its proposed definition of 'distribution customer' to specifically exclude unmetered customers. Ergon Energy considered this amendment should be made for clarity, given it tracks unmetered supplies by assigning an 'electronic NMI' (i.e. a number reflecting a NMI that is in a dedicated number range with there being no physical meter (or NMI) at the premises).¹²²</p> <p>The QCA's recommendation is that the definition of 'distribution customer' should be amended to specifically exclude unmetered customers. This is consistent with the current practices of Energex and Ergon Energy and is consistent with the approach taken in the STPIS.</p>
Inactive accounts are excluded.	<p>Energex and Ergon Energy said this change aligns to the STPIS and represents the current work practices of the DNSPs.¹²³</p> <p>Given the QCA's recommendation to adopt Energex and Ergon Energy's proposed definition of 'distribution customer', which operates to exclude inactive accounts for the purposes of SAIFI and SAIDI calculations, the QCA considers the incorporation of this note is unnecessary. Energex and Ergon Energy supported the QCA's position on this matter.¹²⁴</p>

¹²⁰ Energex and Ergon Energy, sub. 4, pp. 21–23.

¹²¹ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 18–19.

¹²² Energex and Ergon Energy, sub. 5, pp. 6–7, 14.

¹²³ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 18.

¹²⁴ Energex and Ergon Energy, sub. 5, p. 14.

Proposed note	QCA position
<p>If a customer advises the DNSP that it does not want supply to be restored, the customer minutes off supply of this specific customer should not be included in the SAIDI calculation.</p>	<p>Energex and Ergon Energy said this would represent a change in its current work practices but considered it would more accurately reflect network performance and reflects that a customer request to remain disconnected is an event outside the control of the DNSP. While they considered these events are uncommon, they indicated they do incur situations where such customers can record being without supply for 'months at a time'.¹²⁵</p> <p>In our draft report, the QCA considered it reasonable to exclude the minutes off supply for the purposes of SAIDI calculations in these circumstances, given this would be outside the control of the DNSPs. However, this was subject to Energex and Ergon Energy providing further information on how they propose it be incorporated into the distribution authorities, taking into account the statutory context and terminology of the distribution authorities. Energex and Ergon Energy proposed this be incorporated by amending the definition of 'interruption' to provide that an interruption does not include 'customers requesting not to have supply restored'.¹²⁶</p> <p>The QCA does not consider it appropriate to recommend Energex and Ergon Energy's proposed amendment be adopted. While the QCA understands this is not Energex and Ergon Energy's intention, amending the definition of 'interruption' in this way would mean that both the SAIFI and SAIDI measures would be affected (that is, if a customer requests not to have supply restored, that interruption would not be reflected in either the SAIFI or SAIDI performance). Regardless of whether a customer requests not to have supply restored, supply has been interrupted and that interruption should still be counted toward the calculation of SAIFI. This would also be inconsistent with the STPIS approach, which is specific to SAIDI calculations.</p> <p>As an alternative, the QCA has considered whether this could be achieved by incorporating it within the definition of 'SAIDI'. However, we have not recommended this amendment, given Energex and Ergon Energy's preference to align core definitions (such as SAIDI) with their STPIS equivalents to minimise confusion and inefficiencies in outage management and reporting across both frameworks.¹²⁷</p> <p>Given Energex and Ergon Energy have not provided a suitable proposal to incorporate this provision within the distribution authorities, the QCA has not recommended any amendments in respect of this matter. In doing so, the QCA considers the scenario of customers requesting not to have supply restored is likely to have a marginal effect on overall MSS performance, noting Energex and Ergon Energy have stated these situations are not a frequent or widespread occurrence. Further, the current treatment of this scenario does not result in customer interruptions being understated. However, this matter should be revisited in future if it becomes apparent it is having a greater impact on MSS performance reporting.</p>
<p>A single premises outage is a network interruption irrespective of whether the outage is caused by the customer's installation. However, if power is still available at the point of supply, there is no supply interruption.</p>	<p>Energex and Ergon Energy said this change would align to the STPIS and reflects their current work practices. It suggested this note replace the existing exclusion for customer installations that is included in clause 9.3(d) of the distribution authorities.¹²⁸</p> <p>The QCA considers this note does not need to be incorporated into the distribution authorities, in light of the QCA's recommendation in respect of clause 9.3(d) of the distribution authorities (as discussed below in the</p>

¹²⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 18.

¹²⁶ Energex and Ergon Energy, sub. 5, pp. 7–8, 15.

¹²⁷ Energex and Ergon Energy, sub. 4, p. 8.

¹²⁸ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 16–17.

Proposed note	QCA position
<p>For high voltage (HV) feeder single phase outages—unless there are accurate means to determine the exact number of customers affected, 33% of all downstream customers are taken to be affected for a single-phase HV feeder outage on a three phase network. 100% of customers are taken to be affected for all other HV outages. For example, when there is a single HV phase outage on a two phase or single phase HV system, 100% of customers are taken to be affected.</p>	<p>discussion of other exclusions). Energex and Ergon Energy supported the QCA's position on this matter.¹²⁹</p> <p>Energex and Ergon Energy initially proposed the inclusion of this note to align to the STPIS. They said they each currently treat a single phase or multiphase outage as an outage affecting 100% of connected customers, which means they currently overstate the number of customers off supply. They considered applying the lesser percentage to single-phase HV faults will more accurately reflect network performance. Ergon Energy said these types of outages represent 0.6% of its unplanned outages and, as such, the impact on customer minutes off supply will be minimal.¹³⁰ Energex said that only approximately 0.25 per cent of devices on Energex's network have single phase operating capability.¹³¹</p> <p>The QCA sought further information from Energex and Ergon Energy in order to determine what the implications of this proposed amendment would be, if incorporated within the distribution authorities. In response, Energex and Ergon Energy supported not incorporating this within the distribution authorities. They considered that making this amendment would lead to increased complexities and costs, with no benefit to customers, and that maintaining the current approach would not disadvantage customers in any way.¹³²</p> <p>In light of the above, the QCA considers no case has been established to incorporate this note within the distribution authorities. Accordingly, the QCA does not recommend any amendments be made in respect of this matter.</p>
<p>For low voltage single phase outage – unless there are accurate means to determine the exact number of customers affected, 33% of all downstream customers for a single-phase outage are taken to be affected.</p>	<p>Energex and Ergon Energy said this would represent a change in their work practices, as they currently treat all LV outages as three phase faults affecting all distribution customers. While recommending its inclusion in the distribution authorities for alignment with the STPIS, Energex and Ergon Energy said they will have difficulty in implementing this measure and will be discussing this further with the AER. They also said they are not intending to change their work practices to align with this measure at this time.¹³³</p> <p>Given the implementation difficulties indicated by Energex and Ergon Energy, it is unclear why this change should be made to the distribution authorities, particularly given their intention to continue their existing work practices at this time. The QCA sought further information from Energex and Ergon Energy about the merits of incorporating this note within the distribution authorities. In response, Energex and Ergon Energy supported not incorporating this within the distribution authorities. They considered that making this amendment would lead to increased complexities and costs, with no benefit to customers, and that maintaining the current approach would not disadvantage customers in any way.¹³⁴</p> <p>In light of the above, the QCA considers no case has been established to incorporate this note within the distribution authorities. Accordingly, the QCA does not recommend any amendments be made in respect of this matter.</p>

¹²⁹ Energex and Ergon Energy, sub. 5, p. 15.

¹³⁰ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 18–19.

¹³¹ Energex and Ergon Energy, sub. 5, p. 8.

¹³² Energex and Ergon Energy, sub. 5, p. 8.

¹³³ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 18–19.

¹³⁴ Energex and Ergon Energy, sub. 5, p. 8.

Planned and unplanned interruptions

A key difference between the distribution authorities and the STPIS is in the treatment of planned interruptions (i.e. an interruption where a customer has been given the required minimum notice of an upcoming interruption to supply). In the distribution authorities, both planned and unplanned interruptions to supply are used when calculating SAIFI and SAIDI outcomes. However, in the STPIS only unplanned interruptions of supply are used.

All interruptions will have an impact on customers. However, a planned interruption should generally have a smaller impact on a customer than an unplanned interruption. This is because a customer may be able to take actions to reduce the impact of an interruption if they are given sufficient notice. Planned interruptions may also be necessary in order to allow maintenance to be performed to the network.

Stakeholders did not support amending the distribution authorities to exclude planned interruptions for the purposes of setting, and reporting against, the SAIFI and SAIDI limits. Energex and Ergon Energy supported retaining planned interruptions in SAIFI and SAIDI limits as it provides a 'holistic view of network performance' and promotes 'customer focused work practices'.¹³⁵ Energex and Ergon Energy considered that while excluding planned interruptions would provide some cost savings across both DNSPs, these savings would not be significant enough for customers to directly benefit from.¹³⁶ QEUN also did not support excluding planned interruptions from the SAIFI and SAIDI limits.¹³⁷

The QCA's recommendation is to retain the existing approach in the distribution authorities and not exclude planned interruptions from the SAIFI and SAIDI limits.

While this is not consistent with the approach taken in the STPIS, the QCA considers this difference in approach is justified based on the different purposes of these two mechanisms. The MSS seek to ensure that customers have a minimum level of disruptions to their supply, whereas the STPIS is an incentive scheme designed to maintain and improve service performance, by providing financial rewards and penalties based on performance outcomes.

Interruptions, planned or otherwise, still have an impact on customers. The inclusion of planned interruptions within the MSS provides an expectation of a minimum level of supply reliability across the network in an absolute sense, not just a minimum level of reliability for interruptions that are unplanned.

While supporting the retention of planned interruptions in the SAIFI and SAIDI limits in general, Energex and Ergon Energy did propose amending the distribution authorities so that 'network non-switching' outages affecting single customers be excluded from planned interruptions.¹³⁸ Energex and Ergon Energy considered that the requirement to measure these outages creates a significant workload for them and that any benefit derived does not reflect the effort incurred.¹³⁹ Ergon Energy reported that single customer planned interruptions represent between one to two per cent of planned minutes off supply and less than one per cent of total customer minutes off supply. Energex did not provide figures, although it said it would anticipate similar results.¹⁴⁰

Energex and Ergon Energy said that network non-switching events comprise of two types of work:

¹³⁵ Energex and Ergon Energy, sub. 4, pp. 9–10; sub. 5, p. 8.

¹³⁶ Energex and Ergon Energy, sub. 4, p. 9.

¹³⁷ QEUN, sub. 3, p. 9.

¹³⁸ Energex and Ergon Energy, sub. 5, p. 8.

¹³⁹ Energex and Ergon Energy, sub. 4, pp. 11, 22–23; sub. 5, pp. 8–9; Response to QCA request for information, 9 April 2019, p. 20.

¹⁴⁰ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 20.

- Customer requested work where potentially other customers are impacted, such as a customer requested meter reconfiguration at a block of units when isolation of a single unit is not possible (i.e. there are no meter isolation links)
- Overhead service line replacement works in order to ensure customer safety (low voltage (LV) services have a hard (bolted) connection to the electrical wires of the network service provider).¹⁴¹

Energex and Ergon Energy said that its internal IT systems do not currently allow them to accurately capture the time customers are off supply for these events. As such, they have manual systems in place to accurately report the time customers are off supply, which is typically up to 45 minutes for an LV service replacement.¹⁴² Energex and Ergon Energy indicated this manual process had an impact equivalent to five full-time equivalent employees¹⁴³ and that their previous investigations of upgrading IT systems to capture the data electronically found that the minimal impact this would have on MSS did not warrant a value proposition for investment purposes.¹⁴⁴

Energex and Ergon Energy proposed the removal of network non-switching events be achieved by making the following amendments to the distribution authorities:

- amend the definition of 'interruption' to provide that it does not include 'customers impacted by network non-switching events'
- include a new definition of 'network non-switching event' that 'means any event initiated by a customer, retailer, meter co-ordinator or the NSP where network switching devices do not provide isolation or disconnection from the electricity system'.¹⁴⁵

The QCA recommends that Energex and Ergon Energy's proposal to exclude interruptions caused by 'network non-switching events' not be accepted.

The QCA has concerns over the scope of the exclusion proposed by Energex and Ergon Energy. It is unclear whether the proposed amendments to the distribution authorities will only apply when single customers are affected. While Energex and Ergon Energy have indicated the intent is that network non-switching outages affecting single customers be excluded from planned interruptions, they have also indicated these types of outages could affect multiple customers.

More broadly, as discussed above, the purpose of the MSS arrangements is to seek to ensure customers have a minimum level of disruptions to their supply. An interruption of typically up to 45 minutes for an LV service replacement is not an insignificant interruption for a customer and the QCA considers these types of interruptions should continue to be included in the MSS arrangements.

Feeder types

The MSS limits are set at different levels according to feeder types. This segmentation of the distribution network into feeder types is designed to reflect the different operating environments and performance expectations across the network.

The same feeder types are used in both the distribution authorities and the STPIS, namely:

- CBD feeders
- urban feeders

¹⁴¹ Energex and Ergon Energy, sub. 5, p. 9.

¹⁴² Energex and Ergon Energy, sub. 5, p. 10.

¹⁴³ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 19.

¹⁴⁴ Energex and Ergon Energy, sub. 5, p. 10.

¹⁴⁵ Energex and Ergon Energy, sub. 5, p. 10.

- short rural feeders
- long rural feeders.¹⁴⁶

The definitions of these feeder types in the distribution authorities are largely consistent with those in the STPIS, with some differences to reflect that not all feeder types are present in Energex and Ergon Energy's respective networks.

Energex and Ergon Energy considered that 'feeder type definitions are at the core of [their] regulatory regimes and processes, and alignment of the feeder definitions will result in keeping reporting costs to a minimum.'¹⁴⁷

Each of the definitions are discussed below.

Urban feeder

Table D2 Definition of urban feeder

<i>Distribution authority</i>	<i>AER's STPIS</i>
<p>For Energex, urban feeder:</p> <ul style="list-style-type: none"> • 'means a feeder which is not a rural feeder or CBD feeder and has an annual actual maximum demand per total feeder route length of greater than 0.3 MVA/km.' <p>For Ergon Energy, urban feeder:</p> <ul style="list-style-type: none"> • 'means a feeder that has an annual actual maximum demand per total feeder route length of greater than 0.3 MVA/km.' 	<p>Urban feeder:</p> <p>'a feeder, which is not a CBD feeder, has a 3-year average maximum demand over the 3-year average feeder route length greater than 0.3 MVA/km.'</p>

A notable difference between these definitions is that the AER now applies a threshold based on the three-year average maximum demand per kilometre of feeder length. The distribution authorities apply a similar parameter, but consider annual actual maximum demand, rather than the three-year average.

This change follows the AEMC's consideration of this definition, in which it noted there can be volatility in the classification of feeders between urban and rural feeders from year to year, given the effect that temperature variations can have on actual demand (and hence whether a feeder is classified as urban or rural).¹⁴⁸

Energex and Ergon Energy supported amending the definition of urban feeder in the distribution authorities to align with the new three-year average threshold applied under the STPIS. It considered this would reduce the number of feeders changing classification within a determination period, and provides 'improved focus on feeder performance and investment options.'¹⁴⁹

The QCA's recommendation is that the definition of urban feeder be amended to reflect the new three-year average threshold applied under the STPIS. The QCA considers it appropriate to have a consistent threshold for classifying urban feeders for the purposes of the MSS and the STPIS.

There are also other minor differences in this definition.

¹⁴⁶ For the definitions of these terms, see clause 1 of the distribution authorities; See AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme*, version 2.0, November 2018, p. 28.

¹⁴⁷ Energex and Ergon Energy, sub. 4, p. 11.

¹⁴⁸ AEMC, *Review of distribution reliability measures*, final report, September 2014, pp. 34–35.

¹⁴⁹ Energex and Ergon Energy, sub. 4, pp. 11, 24.

Unlike the STPIS, Energex’s definition includes a reference to a ‘rural feeder’. The QCA considers this reference is not necessary because ‘short rural feeder’ (the only rural feeder-type in Energex’s distribution area) is defined in such a way as to exclude those feeders that meet the threshold of an urban feeder-type. As such, the definition should be amended to remove this reference. Further, Ergon Energy’s definition does not include a reference to a CBD feeder. The QCA considers this reference is not needed because Ergon Energy does not have any CBD feeders in its distribution area (discussed further below).

Energex and Ergon Energy supported the QCA's recommended amendments to the definition of 'urban feeder'.¹⁵⁰

CBD feeder

Table D3 Definition of CBD feeder

<i>Distribution authority</i>	<i>AER’s STPIS</i>
<p>CBD feeder: 'means a feeder supplying predominantly commercial high-rise buildings, supplied by a predominantly underground supply network containing significant interconnection and redundancy when compared to urban areas.'</p>	<p>CBD feeder: 'a feeder in the central business district (CBD) area of a State or Territory capital; and other equivalent areas that are applicable in the relevant participating jurisdiction as supplying predominantly commercial, high-rise buildings, supplied by a predominantly underground distribution network containing significant interconnection and redundancy when compared to urban areas.'</p>

Unlike the definition under Energex's distribution authority, the STPIS definition makes reference to a feeder being in the CBD area of a state or territory capital or other equivalent areas in the relevant jurisdiction. The QCA considers this difference is not material, given the distribution authority definition will capture feeders in the Brisbane CBD area, and is capable of applying in other equivalent areas in Energex’s distribution area.

The QCA also notes the distribution authority definition refers to an ‘underground supply network’ (as opposed to an underground distribution network, as used in the STPIS). The use of ‘supply network’ reflects the terminology used in the Electricity Act and, in any event, the QCA considers this difference in terminology is not material. Accordingly, the QCA proposes no changes be made to the definition of CBD feeder in Energex’s distribution authority. Energex supported this position.¹⁵¹

The QCA notes that Ergon Energy’s distribution authority does not include a definition for CBD feeder. Ergon Energy considered this definition was not needed for Ergon Energy, given it is not a category reflective of its feeders or its system.¹⁵² The QCA also considers this definition is not necessary at this time. If Ergon Energy were, in future, to have feeders that could meet the definition of a CBD feeder type, the distribution authority could be amended at that point in time to include this definition, along with introducing MSS levels for the new feeder type.

¹⁵⁰ Energex and Ergon Energy, sub. 5, p. 7.

¹⁵¹ Energex and Ergon Energy, sub. 5, p. 7.

¹⁵² Energex and Ergon Energy, sub. 4, p. 24.

Long rural feeder

Table D4 Definition of long rural feeder

<i>Distribution authority</i>	<i>AER's STPIS</i>
Long rural feeder: 'means a feeder which is not an urban feeder or isolated feeder ¹⁵³ and has a total feeder route length of greater than 200 km.' ¹⁵⁴	Long rural feeder: 'a feeder which is not a CBD feeder, urban feeder or short rural feeder.'

There are some minor differences between these two definitions. In particular, the definition in Ergon Energy's distribution authority:

- includes a reference to an 'isolated feeder', which is a term not used in the STPIS
- does not include a reference to a CBD feeder
- includes a reference to the feeder having a total feeder length of greater than 200 km in order to distinguish itself from short rural feeders. In contrast, the equivalent definition of long rural feeder in the STPIS does not reference total feeder length, as feeder length is used in the definition of a short rural feeder instead.

The QCA considers that these differences are not material and that, in practice, the classification of long rural feeders under Ergon Energy's distribution authority is consistent with the STPIS.

In regards to the usage of 'isolated feeder', this term is used to distinguish Ergon Energy's feeders that are not connected to the national electricity grid (except for the Mt Isa–Cloncurry supply network), which may otherwise be captured within the definition of a long rural feeder. This difference in the definition accounts for the specific circumstances of Ergon Energy's network and the QCA considers that it is appropriate to retain this reference in the definition.

Ergon Energy initially proposed the definition used in its distribution authority be amended as follows:

means a feeder which is not a **CBD**, urban or isolated feeder, with a total feeder length **equal to, or greater than 200 km.**¹⁵⁵ [amendments indicated in bold]

The QCA does not consider the definition in Ergon Energy's distribution authority should be amended to include a reference to a CBD feeder. Given this feeder type is not defined in Ergon Energy's distribution authority, usage of this term for consistency with the STPIS definition is unnecessary and could create confusion.

However, the QCA recommends adopting Ergon Energy's proposed amendment to clarify that the definition applies to feeders 'equal to' or greater than 200 km. The QCA considers this is consistent with how the definition currently applies but avoids any potential uncertainty that may be caused, given how Ergon Energy's distribution authority also defines short rural feeder as being less than 200 km (Table D5). Ergon Energy supported the QCA's recommendation for this definition.¹⁵⁶

Finally, the QCA considers that Energex's distribution authority does not need to include a definition for long rural feeder, given it does not have any feeders of this type in its network.¹⁵⁷ If Energex were, in future,

¹⁵³ 'Isolated feeder' is a term defined in Ergon Energy's distribution authority and means 'a feeder which is not connected to the national grid, but excludes the Mt Isa–Cloncurry supply network, as that network is defined in the Act'.

¹⁵⁴ Long rural feeder is not used in Energex's distribution authority.

¹⁵⁵ Energex and Ergon Energy, sub. 4, p. 25.

¹⁵⁶ Energex and Ergon Energy, sub. 5, p. 7.

¹⁵⁷ Energex and Ergon Energy, sub. 4, p. 25.

to have feeders that could meet the definition of a long rural feeder, the distribution authority could be amended at that point in time to include this definition, along with introducing MSS levels for the new feeder type.

Short rural feeder

Table D5 Definition of short rural feeder

<i>Distribution authority</i>	<i>AER's STPIS</i>
<p>For Energex, short rural feeder:</p> <ul style="list-style-type: none"> 'means a feeder which is not an urban feeder or CBD feeder.' <p>For Ergon Energy, short rural feeder:</p> <ul style="list-style-type: none"> 'means a feeder which has a total feeder route length less than 200 km, and is not an urban feeder or isolated feeder.' 	<p>Short rural feeder:</p> <p>'a feeder which is not a CBD feeder or urban feeder with a total feeder route length less than 200 km.'</p>

Energex's definition does not include a reference to the total feeder route length. The QCA understands this is because Energex does not have any feeders that meet the characteristics of a long rural feeder (i.e. not a CBD or urban feeder, and does not have a total feeder length more than 200 km). Accordingly, a distinction between rural feeders is not needed.

Energex has proposed this definition be amended to include a reference to having a total feeder route length less than 200 km.¹⁵⁸

However, given the characteristics of Energex's distribution area and network, there is already consistency in the classification of short rural feeders with the STPIS in practice. Accordingly, the QCA does not consider it necessary for Energex's definition to be amended as proposed by Energex. If this definition was amended in this way, and in the future Energex were to have feeders with a total feeder route length greater than 200 km (however unlikely that may be), those feeders would not fall under Energex's feeder type definitions and hence would have no MSS limits. The QCA does not consider it worthwhile to include a 'back stop' definition of long rural feeder to account for that unlikely scenario. Instead, if Energex was in future to have feeders that could be considered a long rural feeder, the distribution authority can be amended at that point in time to include a long rural feeder type definition, along with introducing MSS limits for the new feeder type.

The definition of short rural feeder in Ergon Energy's distribution authority does not refer to a CBD feeder. While it appears that Ergon Energy has proposed including a reference to CBD feeder in its distribution authority,¹⁵⁹ the QCA considers this reference is not necessary. Given this feeder type is not defined in Ergon Energy's distribution authority (see above), usage of this term for consistency with the STPIS definition is unnecessary and could create confusion.

Further, Ergon Energy's definition also includes reference to an 'isolated feeder', which is not used in the STPIS definition. As described above, this difference accounts for the specific circumstances of Ergon Energy's network and the QCA considers no amendment is necessary.

Accordingly, the QCA recommends no amendments be made to the definition of 'short rural feeder'.

¹⁵⁸ Energex and Ergon Energy, sub. 4, p. 24.

¹⁵⁹ Energex and Ergon Energy, sub. 4, p. 24.

Momentary interruptions

In the distribution authorities, interruptions of one minute or less are excluded from the calculation of SAIFI and SAIDI.¹⁶⁰ These interruptions are commonly referred to in other jurisdictions as 'momentary interruptions', with interruptions going beyond that threshold referred to as 'sustained interruptions'.

Recently, the STPIS was amended to increase the duration of what are considered momentary interruptions from 'one minute or less' to 'three minutes or less.'¹⁶¹ This was consistent with a recommendation from the AEMC, which considered this change would be likely to promote greater investment in distribution automation systems that can improve reliability performance by automatically restoring supply to customers.¹⁶²

The increased threshold of three minutes has also recently been adopted in South Australia, with the Essential Services Commission of South Australia (ESCOSA) noting the extended timeframe allows a wider range of automation technologies to be used to restore power.¹⁶³

Energex and Ergon Energy supported amending their distribution authorities to exclude interruptions of 'three minutes or less' for consistency with the STPIS. They considered non-alignment results in additional requirements on the DNSPs, adding unnecessary costs to their customers.¹⁶⁴ Energex and Ergon Energy have provided back-casting analysis that indicates that the average impact of the revised definition on overall reported five-year average SAIDI performance is less than 1 per cent and less than 5 per cent for SAIFI.¹⁶⁵

The QCA's recommendation is that the distribution authorities be amended so that interruptions of 'three minutes or less' are excluded from the MSS limits. The QCA notes the benefits identified by the AEMC in its recommendation for making this change at the national level. Further, the QCA considers there should be a consistent threshold in the MSS and STPIS for determining an interruption for the purposes of SAIFI and SAIDI. Having different thresholds would create complexity and inefficiencies in Energex and Ergon Energy's regulatory reporting and compliance activities.

Other exclusions

A number of other interruptions in both the distribution authorities¹⁶⁶ and the STPIS are excluded when calculating SAIFI and SAIDI performance.¹⁶⁷

These exclusions include interruptions that are beyond the control of the DNSP (e.g. interruptions caused by failure of the transmission grid) or events that lead to conditions that are not representative of a typical day of network availability (e.g. 'major event days').

Interruptions caused by directions from police or emergency services

Under the distribution authorities, an interruption resulting from 'a direction by a police officer or another authorised person exercising powers in relation to public safety' is excluded (cl. 9.3(b)(v)).

¹⁶⁰ Clause 9.3(a) of each distribution authority.

¹⁶¹ AER, *Amendment to the Service Target Performance Incentive Scheme*, final decision, November 2018, pp. 16–17.

¹⁶² AEMC, *Review of distribution reliability measures*, final report, September 2014, pp. 12–13.

¹⁶³ ESCOSA, *SA Power Network's reliability standards review*, final decision, January 2019, p. 32.

¹⁶⁴ Energex and Ergon Energy, sub. 4, pp. 10–11, 19; sub. 5, p. 7.

¹⁶⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 12.

¹⁶⁶ Clause 9.3 of each distribution authority.

¹⁶⁷ AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme*, version 2.0, November 2018, cl. 3.3.

A similar exclusion is listed under the STPIS, as follows:

load interruptions caused or extended by a direction from state or federal emergency services, provided that a fault in, or the operation of, the network did not cause, in whole or part, the event giving rise to the direction.¹⁶⁸

Energex and Ergon Energy proposed that this exclusion in the distribution authorities should be amended to mirror the language used in the STPIS.¹⁶⁹

In our draft report, the QCA proposed to recommend Energex and Ergon Energy's proposal be adopted. However, in response to our draft recommendation to not replicate clause 3.3(a)(7) of the STPIS within the distribution authorities (a broad exclusion for interruptions resulting from the exercise of any obligations, rights or discretions under electricity legislation – see below), Energex and Ergon Energy indicated they rely on the existing description of emergency services in the distribution authorities to exclude interruptions caused when they are acting as an emergency service (e.g. turning off power to areas affected by flood or cyclone events in the interests of public safety). They considered the description of emergency services used in the STPIS would not be broad enough to capture interruptions in these circumstances.¹⁷⁰

It is reasonable to exclude interruptions resulting from Energex and Ergon Energy acting as an emergency service. The QCA considers it preferable for these exclusions to be provided for under this emergency services exclusion, rather than through reliance on the broad exclusion provided for under clause 3.3(a)(7) of the STPIS (see below). Accordingly, the QCA's recommendation is that the existing description of emergency services used in the distribution authorities should be retained (that is, a police officer or another authorised person exercising powers in relation to public safety).

However, for consistency with the approach taken under the STPIS exclusion, the QCA recommends the exclusion should be amended so that the event giving rise to the direction from emergency services was not caused by a fault in, or the operation of, the network. This should ensure this exclusion will only apply if the interruption was outside of the control of the DNSP and not caused by their fault or negligence.

Interruptions caused by a customer's electrical installation

Under the distribution authorities, an interruption caused by a customer's electrical installation or failure of that electrical installation is excluded (cl. 9.3(c)).

In its review of the STPIS, the AER did not accept a proposal from Energex and Ergon Energy to incorporate this exclusion within the list of exclusions set out in clause 3.3 of the STPIS. It considered that a DNSP can install protection equipment to safeguard its own network and protect network users from interruptions caused by a customer's failed installation. As such, it considered an interruption of this nature is capable of being controlled by DNSPs and therefore should not be excluded. Further, provided the DNSP's network remains intact, the AER considered a customer's failed installation would not constitute an interruption for network reliability performance.¹⁷¹

This approach is reflected in 'note 6' included in the table of standard definitions for the STPIS:

¹⁶⁸ AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme*, version 2.0, November 2018, cl. 3.3(a)(8). This drafting is also included in the AER, *Distribution Reliability Measures Guideline*, November 2018, p. 8.

¹⁶⁹ Energex and Ergon Energy, sub. 4, p. 20; sub. 5, p. 13.

¹⁷⁰ Energex and Ergon Energy, sub. 5, p. 11.

¹⁷¹ AER, *Amendment to the Service Target Performance Incentive Scheme*, final decision, November 2018, pp. 18–19.

a single premises outage is a network interruption irrespective of whether the outage is caused by the customer's installation. However, if power is still available at the point of supply, there is no supply interruption.¹⁷²

Energex and Ergon Energy proposed that this exclusion in the distribution authorities be retained, and amended, as follows:

an interruption caused by a customer's electrical installation, **a customer's request to be disconnected to isolate their installation**, or failure of that electrical installation.¹⁷³ [amendments in bold]

Energex and Ergon Energy said its proposed amendment is for clarity and that a customer request is outside the control of the DNSP.¹⁷⁴

Subsequently, Energex and Ergon Energy suggested its proposed amendment be revised so that this exclusion instead be amended to align with 'note 6' of the STPIS. Ergon Energy said this approach was consistent with its current reporting practices.¹⁷⁵

The QCA considers that in considering any amendments to the distribution authorities for consistency with the STPIS, regard must be had to the terminology and statutory context of the distribution authorities.

The QCA does not consider it appropriate to replicate 'note 6' within the list of exclusions in clause 9.3 of the distribution authorities. That would introduce drafting that would not be consistent with the nature of the clause or the existing terminology used in the distribution authorities, which may cause uncertainty in the interpretation or application of this clause.

The QCA's recommendation is that this exclusion be retained and amended as initially proposed by Energex and Ergon Energy, provided it is also amended to provide that the exclusion only applies if power is still available at the point of supply. While this exclusion is not included in the list of exclusions in the STPIS, it is still consistent with the approach taken in the STPIS, as reflected in 'note 6'. That is, it does not excuse a DNSP from taking actions to safeguard its network and protect other network users from interruptions of supply caused by a customer's installation.

The QCA considers the exclusion for the situation where a customer requests to be disconnected to isolate their installation from the network is also reasonable, where power is still available at the point of supply, as this is an event outside the control of the DNSPs.

Energex and Ergon Energy supported the QCA's recommendation for this clause.¹⁷⁶

[Interruptions caused by exercise of obligations, rights or discretions provided for under electricity legislation](#)

The STPIS includes the following exclusion that is not included in the distribution authorities:

load interruptions caused by the exercise of any obligation, right or discretion imposed upon or provided for under jurisdictional electricity legislation or national electricity legislation applying to a DNSP.¹⁷⁷

¹⁷² AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme*, version 2.0, November 2018, p. 26.

¹⁷³ Energex and Ergon Energy, sub. 4, p. 21.

¹⁷⁴ Energex and Ergon Energy, sub. 4, p. 21.

¹⁷⁵ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, pp. 16–17.

¹⁷⁶ Energex and Ergon Energy, sub. 5, pp. 13, 15.

¹⁷⁷ AER, *Electricity Distribution Network Service Providers: Service target performance incentive scheme*, version 2.0, November 2018, cl. 3.3(a)(7). It is also included within AER, *Distribution Reliability Measures Guideline*, November 2018, p. 8.

To determine whether there was a need for this exclusion, the QCA sought information from stakeholders about any types of interruptions that would not otherwise be captured by the other exclusions.

Energex and Ergon Energy proposed including this exclusion in the distribution authorities to align with the STPIS.¹⁷⁸ They considered this exclusion would capture interruptions caused by them when acting as an emergency service. For example, Ergon Energy said it acted as a state emergency service during flood and cyclone events and determined power should be turned off to affected areas in the interests of public safety. The QCA understands Energex and Ergon Energy currently rely on the existing clause 9.3(b)(v) of the distribution authorities (the emergency services exclusion) to exclude interruptions in these circumstances. However, they considered this type of interruption would no longer be captured by the emergency services exclusion, as amended for consistency with the STPIS (see above), as it would then only apply to directions given by state or federal emergency services.¹⁷⁹

While this general 'catch-all' exclusion is used in the STPIS and Distribution Reliability Measures Guidelines, and despite the general benefits of aligning definitions and exclusions with the national arrangements, the QCA has concerns about the broad scope of this exclusion in the context of the MSS, which is intended to provide for a minimum expectation of network reliability standards. The inclusion of such a broad exclusion could have unintended consequences. For example, it could be interpreted as excluding planned interruptions on the basis that this is provided for under electricity legislation.

While it is reasonable to exclude interruptions caused by Energex and Ergon Energy when it is acting as an emergency service, it would be preferable for that to be a specific exclusion, rather than through reliance on a general 'catch-all' exclusion. As discussed above, the QCA has proposed this be achieved by not aligning the description of emergency services in clause 9.3(b)(v) of the distribution authorities with the description used in the equivalent clause of the STPIS. In that way, Energex and Ergon Energy can continue to rely on the existing description of emergency services for these interruptions and avoid the need for the general catch-all exclusion in this example.

Given no further examples were provided of interruptions that would not be captured by the other specific exclusions in the distribution authorities, the QCA considers it is not necessary to include the general catch-all exclusion in the distribution authorities. Accordingly, the QCA does not recommend the distribution authorities be amended to align with clause 3.3(a)(7) of the STPIS. The QCA's positions on the other exclusions are set out in the table below.

Table D6 QCA position on other exclusions

<i>Distribution authority</i>	<i>STPIS</i>	<i>QCA position</i>
an interruption of a duration of one minute or less (cl. 9.3(a)).	Not listed as an exclusion.	While not listed as an exclusion in the STPIS, interruptions of three minutes or less are effectively excluded, as they are built into the definitions for determining SAIDI and SAIFI. The QCA's position on this matter is explained above.
[an interruption resulting from] load shedding due to a shortfall in generation (cl. 9.3(b)(i)).	load shedding due to a generation shortfall (cl. 3.3(a)(2)).	The QCA considers these exclusions are consistent and that no amendments are necessary. Energex and Ergon Energy also proposed no amendments to this exclusion. ¹⁸⁰

¹⁷⁸ Energex and Ergon Energy, sub. 4, p. 20.

¹⁷⁹ Energex and Ergon Energy, sub. 5, p. 11.

¹⁸⁰ Energex and Ergon Energy, sub. 4, p. 19.

Distribution authority	STPIS	QCA position
[an interruption resulting from] a direction by AEMO, a system operator or any other body exercising a similar function under the Act, the NER or the NEL (cl. 9.3(b)(ii)).	load shedding at the direction of the Australian Energy Market Operator (AEMO) or a system operator (cl. 3.3(a)(4)).	While the drafting is not exactly the same, the QCA considers these exclusions are consistent and that no amendments are necessary. Although Energex and Ergon Energy initially proposed this exclusion be amended to mirror the language used in the STPIS, Energex and Ergon Energy supported the QCA's position on this matter. ¹⁸¹
[an interruption resulting from] automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards (cl. 9.3(b)(iii)).	automatic load shedding due to the operation of under frequency relays following the occurrence of a power system under-frequency condition (cl. 3.3(a)(3)).	The key difference is that the distribution authorities specifically refer to the 'power system security and reliability standards' as defined under the National Energy Rules, whereas these are not referenced in the STPIS. Energex and Ergon Energy proposed this exclusion be amended to mirror the language used in the STPIS. ¹⁸² They also considered an under-frequency event is infrequent, with only one event recorded in each network in the past four years. ¹⁸³ The QCA's recommendation is that the drafting of this exclusion should be aligned with the STPIS for consistency.
[an interruption resulting from] a failure of the shared transmission grid (cl. 9.3(b)(iv)).	load interruptions caused by a failure of the shared transmission network (cl. 3.3(a)(5)).	Energex and Ergon Energy proposed this exclusion be amended to mirror the language used in the STPIS. ¹⁸⁴ The use of 'transmission grid' in the distribution authorities reflects the terminology of the Electricity Act. While the drafting is not exactly the same, the QCA considers these exclusions are consistent and that no amendments are necessary.
No equivalent	load interruptions caused by a failure of transmission connection assets except where the interruptions were due to: (a) actions, or inactions, of the DNSP that are inconsistent with good industry practice; or (b) inadequate planning of transmission connections and the DNSP is responsible for transmission connection planning (cl. 3.3(a)(6)).	Energex and Ergon Energy proposed that this exclusion be included to align with the STPIS. ¹⁸⁵ The QCA considers it reasonable to exclude interruptions in these circumstances and provide consistency with the STPIS. Accordingly, the QCA's recommendation is that this exclusion be incorporated within the distribution authorities. The QCA has decided not to include a definition for 'transmission connection assets' as part of the recommended amendments, on the basis of information provided by Energex and Ergon Energy that this is not necessary, given these are defined in detail in the connection and access agreements each DNSP has with Powerlink. ¹⁸⁶ However, the QCA's proposed drafting of the exclusion contains some minor drafting

¹⁸¹ Energex and Ergon Energy, sub. 4: 19; sub. 5, p. 17.

¹⁸² Energex and Ergon Energy, sub. 4: 19; sub. 5, p. 13.

¹⁸³ Energex and Ergon Energy, Response to QCA request for information, 9 April 2019, p. 15.

¹⁸⁴ Energex and Ergon Energy, sub. 4, p. 19.

¹⁸⁵ Energex and Ergon Energy, sub. 4, pp. 19–20.

¹⁸⁶ Energex and Ergon Energy, sub. 5, p. 11.

<i>Distribution authority</i>	<i>STPIS</i>	<i>QCA position</i>
		differences when compared with the STPIS to reflect the terminology of the distribution authorities. Energex and Ergon Energy supported the QCA's proposed drafting of this exclusion. ¹⁸⁷
any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day (cl. 9.3(c)).	an event may also be excluded where daily unplanned SAIDI for the DNSP's distribution network exceeds the major event day boundary, as set out in appendix D, when the event has not been excluded under clause 3.3(a) (cl. 3.3(b)).	Energex and Ergon Energy did not propose any changes to this exclusion. ¹⁸⁸ The QCA has not recommended any amendments to this exclusion.

¹⁸⁷ Energex and Ergon Energy, sub. 5, p. 13.

¹⁸⁸ Energex and Ergon Energy, sub. 4, p. 21.

APPENDIX E: RECOMMENDED WPF PROVISIONS

This appendix sets out the QCA's recommended revisions to the WPF components of Energex and Ergon Energy's distribution authorities.

Energex

11. Improvement Programs

11.1 Purpose

The purpose of the improvement programs are to enable customers with the worst reliability outcomes to benefit from tailored network reliability improvements measures, where prudent opportunities to do so exist.

11.2 Requirements

- (a) From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the reliability of the distribution entity's worst performing 11kV distribution feeders;
- (b) The distribution entity will implement a program to improve the reliability on the worst performing 11kV distribution feeders based on the criteria set out in Clause 11.2(c); and
- (c) The worst performing 11kV feeder improvement program will apply to any distribution 11kV feeder that which meets the following criteria:
 - (i) The distribution 11kV feeder is in the worst 510% of the network's distribution HV (high voltage) 11kV feeders, based on its three-year average SAIDI/SAIFI performance; and
 - (ii) The distribution HV 11kV feeder's SAIDI/SAIFI outcome is 200150% or more of the MSS SAIDI/SAIFI limit applicable to that category of 11kV feeder.

Ergon Energy

11. Improvement Programs

11.1 Purpose

The purpose of the improvement programs are to enable customers with the worst reliability outcomes to benefit from tailored network reliability improvement measures, where prudent opportunities to do so exist.

11.2 Requirements

- (a) From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the reliability of the distribution entity's worst performing distribution feeders;
- (b) The distribution entity will implement a program to improve the reliability on the worst performing distribution feeders based on the criteria set out in Clause 11.2(c); and
- (c) The worst performing distribution-feeder improvement program which applies across a 5 year work program will apply to any distribution feeder that which meets the following criteria:
 - (i) The distribution feeder is in the worst 5% of the network's distribution HV (high voltage) feeders, based on its three-year average SAIDI/SAIFI performance; and The distribution

~~feeder's three-year average SAIDI outcome is 200% or more of the MSS SAIDI limit applicable to that category of distribution feeder; and~~

- ~~(i)(ii) The distribution HV feeder's SAIDI/SAIFI outcome is 200% or more of the MSS SAIDI/SAIFI limit applicable to that category of feeder. The distribution feeder is determined to be in the 50 worst performing feeders across all feeder categories, excluding feeders with less than 20 customers.~~

APPENDIX F: RECOMMENDED SAFETY NET PROVISIONS

This appendix sets out the QCA's recommended revisions to those elements of Energex and Ergon Energy's distribution authorities relevant to the Service Safety Net provisions.

Energex

10. Safety Net

10.1 Purpose

The purpose of the service safety net, applicable from 1 July 2014 onwards, is to seek to effectively mitigate the risk of low probability – high consequence network outages to avoid unexpected customer hardship and/or significant community or economic disruption.

10.2 Safety Net Targets

- (a) The distribution entity will design, plan and operate its supply network to ensure, to the extent reasonably practicable, that it achieves its safety net targets as specified in Schedule 3.
- (b) From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the measures taken to achieve its safety net targets.
- (c) From 1 July 2015 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on its performance against its safety net targets.

10.3 Exclusions for Safety Net

In determining whether the distribution entity has achieved its safety net targets, the following interruptions will not be taken into account:

- (a) an interruption resulting from:
 - (i) load shedding due to a shortfall in generation;
 - (ii) a direction by AEMO, a system operator or any other body exercising a similar function under the Act, the NER or the NEL;
 - (iii) automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards;
 - (iv) a failure of the shared transmission grid; or
 - (v) a direction by a police officer or another authorised person exercising powers in relation to public ~~safety~~ safety and/or employee safety;
- (b) any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day; ~~and~~
- (c) ~~an~~ an interruption caused by a customer's electrical installation or failure of that electrical installation; ~~:-~~
- (d) an interruption occurring during a state or federally declared natural disaster event beginning on the day of the event through to declaration of the end of the emergency condition;

- (e) an interruption occurring in a network where planned works are being undertaken, which materially impacts the outage risk profile of that network; and
- (f) an interruption caused by -a retailer's actions.

Ergon Energy

10. Safety Net

10.1 Purpose

The purpose of the service safety net, applicable from 1 July 2014 onwards, is to seek to effectively mitigate the risk of low probability – high consequence network outages to avoid unexpected customer hardship and/or significant community or economic disruption.

10.2 Safety Net Targets

- (a) The distribution entity will ensure, to the extent reasonably practicable, that it achieves its safety net targets as specified in Schedule 4.
- (b) From 1 July 2014 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on the measures taken to achieve its safety net targets.
- (c) From 1 July 2015 onwards, the distribution entity will, as part of its Distribution Annual Planning Report, monitor and report on its performance against its safety net targets.

10.3 Exclusions for Safety Net

In determining whether the distribution entity has achieved its safety net targets, the following interruptions will not be taken into account:

- (a) an interruption resulting from:
 - (i) load shedding due to a shortfall in generation;
 - (ii) a direction by AEMO, a system operator or any other body exercising a similar function under the Act, the NER or the NEL;
 - (iii) automatic shedding of load under the control of under-frequency relays following the occurrence of a power system under-frequency condition described in the power system security and reliability standards;
 - (iv) a failure of the shared transmission grid; or
 - (v) a direction by a police officer or another authorised person exercising powers in relation to public and/or employee safety;
- (b) any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day;
- (c) an interruption caused by a customer's electrical installation or failure of that electrical installation;
- (d) an interruption occurring during a state or federally declared natural disaster event beginning on the day of the event through to declaration of the end of the emergency condition;
- (e) an interruption occurring in a network where planned works are being undertaken, which materially impacts the outage risk profile of that network; and

(f) an interruption caused by a retailer's actions.

APPENDIX G: JURISDICTIONAL COMPARISONS

Worst performing feeders

Most Australian jurisdictions impose explicit obligations to identify and report on the worst performing parts of their networks. The table below summarises these obligations.

In all examples, performance is measured in terms of interruption frequency or duration performance outcomes. Most measures of worst performance are expressed as minimum standards for individual feeder performance, while others relate to performance in defined supply areas or regions within the network (South Australia and Tasmania). Western Australia is unique, as it maintains a customer-focused approach that requires the DNSP to address poor reliability at the individual small customer level.

In all jurisdictions except the Northern Territory, the level of performance that constitutes 'worst' performance reflects either a multiple of actual average reliability performance, or a relevant average minimum standard (or similar).

The arrangements in New South Wales share the most similarities with the current Queensland arrangements. The NSW individual feeder obligations are, however, more prescriptive and require investigation reports, timeframes for rectification, and obligations to consider non-network solutions.

The Queensland provisions appear unique in that they establish a two-limbed test for identifying worst performing feeders, which includes a percentile criterion. All other jurisdictions appear to apply a single-criterion test.

There appears to be no explicit statutory requirement to identify or rectify poor performing parts of the networks in Victoria or the Australian Capital Territory. However, we understand that the network businesses in these jurisdictions may establish their own internal standards and criteria as part of network planning and management processes.

In 2018, the AER also introduced additional reporting requirements within the regulatory information notices of DNSPs. Under these requirements, DNSPs will report on poor performance at the individual customer level and identify individual feeders supplying the most-inadequately-served customers.

Table G.1 Comparison of jurisdictional worst performing/individual feeder obligations

<i>Jurisdiction/Regulatory body</i>	<i>Measure of worst performance/criteria</i>	<i>Obligations</i>
Queensland (EQL proposed)	Worst performing feeders: Individual feeders that demonstrate SAIDI or SAIFI performance that is 200% or more of the relevant average feeder limit; and is in the bottom 5% of feeders by performance based on three-year average performance.	DNSPs must: <ul style="list-style-type: none"> • monitor and report on identified worst performing feeders • develop and implement improvement plans for identified feeders.¹⁸⁹
New South Wales ¹⁹⁰	Individual feeder standards: Fixed SAIDI and SAIFI thresholds that are, on average, around 300% of the	DNSPs must: <ul style="list-style-type: none"> • investigate the causes for each feeder exceeding the individual feeder standards

¹⁸⁹ See, Distribution Authorities, cl. 11.2.

¹⁹⁰ See, The Hon. Anthony Roberts MP, Minister for Resources & Energy, Reliability and performance licence conditions for electricity distributors, Commencement date 1 July 2014, cl. 16.

Jurisdiction/Regulatory body	Measure of worst performance/criteria	Obligations
	corresponding average feeder category standards.	<ul style="list-style-type: none"> • complete an investigation report identifying the causes and any action required to improve the performance • complete any operational actions identified in the investigation report to improve the performance of each feeder to the individual feeder standards by the end of the third quarter following the quarter in which each feeder first exceeded the individual feeder standards • for remediation other than operational actions, develop a project plan, including implementation timetable, and commence its implementation by the end of the second quarter following the quarter in which the feeder first exceeded the individual feeder standards; • consider non-network strategies which provide reliable outcomes for customers. Where found by the investigation report to be equal or more cost-effective than the lowest cost feasible network option such strategies shall be adopted rather than network augmentation options; • ensure that the implementation timetable for the network project plan or alternative non-network solutions is as short as is reasonably practicable; • where all reasonable steps to improve supply reliability have been taken, the costs of further actions to rectify the non-compliance must be subject to a cost benefit analysis. Where such analysis does not provide a positive benefit, no further action will be taken to improve the feeder's performance and the ongoing non-conformance with the individual feeder standards will be reported to the Minister • The investigation report is to include a documented rectification plan where action is found to be justified in order to improve the performance of a feeder to the individual feeder standards. The action that is required may involve work to other network elements, or may involve only repair or maintenance work where capital works are not warranted and take into account any one-off events and previous performance trends.¹⁹¹
Tasmania ¹⁹²	Supply reliability communities: The Tasmanian Electricity Code prescribes minimum SAIDI and SAIFI levels for feeder categories (by customer density), and	There are no formal requirements to produce improvement plans, however; the Code requires the network to use reasonable endeavours to ensure that the average annual number and

¹⁹¹ The Hon. Anthony Roberts MP, Minister for Resources & Energy, Reliability and performance licence conditions for electricity distributors, Commencement date 1 July 2014, cl. 16.

¹⁹² See, Tasmanian Electricity Code, April 2017, cl. 8.6.11.

Jurisdiction/Regulatory body	Measure of worst performance/criteria	Obligations
	individual regions or 'supply reliability communities', defined according to customer density. SAIDI and SAIFI limits for communities are greater than the corresponding feeder level standards by between 120% and 200%.	duration of interruptions in each community category do not exceed the relevant limit. TasNetworks reports on individual supply 'communities' that do not meet the average minimum supply area reliability standards prescribed in the Tasmanian Electricity Code. ¹⁹³
South Australia ¹⁹⁴	Low reliability feeders: An individual feeder with unplanned SAIDI performance twice the mean of unplanned SAIDI for that region for two consecutive financial years.	SA Power Networks must report on unplanned SAIDI and SAIFI of these feeders, feeder location, and any action undertaken and/or planned to improve the reliability of each identified feeder.
Western Australia ¹⁹⁵	Significant interruptions to small customers: Any small customer that has been interrupted for more than 12 hours continuously, or has been interrupted more than the prescribed number of times during a year (9 times for CBD and urban customers, 16 times for other areas).	Where a customer meeting the criteria is identified, the distributor must either: <ul style="list-style-type: none"> remedy the cause or causes of interruption so that the prescribed standard is met; or enter into an alternative arrangement to the customer's satisfaction for the supply of electricity to the customer. The distributor must report on the number of customers identified under the criteria.
Northern Territory ¹⁹⁶	Poorly performing feeders: The five worst performing feeders within a feeder category.	Network business must report on the five worst performing feeders within each feeder category, including: <ul style="list-style-type: none"> the SAIDI performance of the individual feeder that was used to identify each individual feeder that has performed poorly; and a statement that explains the poor SAIDI performance of each of these individual feeders and the action the network entity intends to take to improve the poor SAIDI performance of these individual feeders. Network entities must provide the Utilities Commission with a list of feeders that will be subject to capital improvements in the current financial year. The information provided should include a brief description of the capital works, capital expenditure in the financial year, total capital expenditure for the project, and planned start and completion dates. ¹⁹⁷

¹⁹³ See, TasNetworks, *Annual Planning Report 2018*, pp. 114–15.

¹⁹⁴ ESCOSA, *SA Power Networks reliability standards review*, final decision, January 2019, p. 60.

¹⁹⁵ Western Australia, *Electricity Industry (Network Quality and Reliability of Supply) Code 2005*, 1 October 2018, cl. 12.

¹⁹⁶ Utilities Commission, *Electricity Industry Performance Code (Standards of Service and Guaranteed Service Levels)*, 25 October 2017, Schedule 3, S.3.5.

¹⁹⁷ Utilities Commission, *Electricity Industry Performance Code (Standards of Service and Guaranteed Service Levels)*, 25 October 2017, Schedule 3, S.3.5.

Jurisdiction/Regulatory body	Measure of worst performance/criteria	Obligations
Australian Energy Regulator ¹⁹⁸	Inadequately served customers: Inadequately served customer means a customer experiencing greater than 4 times the network average for unplanned SAIDI on a three-year rolling average basis compared with a network average customer.	DNSPs must report annually on the: <ul style="list-style-type: none"> • average unplanned SAIDI and SAIFI of the inadequately served customer • top five feeders with the most inadequately served customers, and number of inadequately served customers of each of those five feeders.
AEMC ¹⁹⁹	Measures for considering lowest reliability customers.	The AEMC suggested that a lowest reliability customer would be identified when: <ul style="list-style-type: none"> • the SAIDI for the feeder section is greater than a specific threshold (for example four times the average SAIDI or the target SAIDI value) • the SAIDI for the feeder section is in the worst 5% of feeder section SAIDI values • the feeder section has been identified as having the lowest reliability, using both the first two criterion, for a number of consecutive years (for example three years).

Network security planning criteria

The term 'service target safety net' is unique to the Queensland regulatory regime for network reliability. Nonetheless, similar arrangements exist in other jurisdictions. For the purposes of comparison, we consider these types of arrangements as 'network security planning criteria'. While the criteria may be characterised differently, a trait they have in common is that they establish standards for the restoration of supply following contingency events (for example, the failure of a key element of network infrastructure). These criteria inform planning and investment decisions to minimise the impact of outages due to failures of critical network infrastructure that have the potential to affect large numbers of downstream users (low-probability, high-impact events). These standards are not targets for the restoration of supply to individual customers following interruptions.

In most cases, network security planning criteria are determined by the DNSPs, having regard to other obligations and standards, including minimum customer reliability standards. In some jurisdictions, regulatory instruments establish a requirement for DNSPs to develop their own technical standards, which may include network security planning criteria.

Planning approaches in all jurisdictions are primarily probabilistic rather than deterministic. This means that DNSPs weigh the probability and consequence of a contingency event in determining an appropriate means of minimising its impact. 'N-x' security criteria are commonly used as triggers for investigation of potential constraints, but not as triggers for investment itself. Where constraints are identified, DNSPs typically undertake engineering and economic assessments of solutions and may undertake investment where there is a net economic benefit of doing so.

The table below summarises the QCA's understanding of current jurisdictional approaches to network security planning criteria.

¹⁹⁸ AER, Explanatory statement, *Establishing a new Distribution Reliability Measures Guideline (DRMG)*, final decision, November 2018, pp. 31–32.

¹⁹⁹ AEMC, *Review of distribution reliability measures*, final report, September 2014, pp. 42–43.

Table G.2 Jurisdictional approaches to network security planning criteria

<i>Jurisdiction/DNSP</i>	<i>Source</i>	<i>Requirements</i>
Queensland (current)	Distribution Authorities (licence conditions)	Probabilistic planning approaches informed by N-1 criteria and targeted timeframes for restoration of supply. Based on level of demand at risk and number of customers affected.
Australian Capital Territory	DNSP-determined internal criteria	Evoenergy applies probabilistic planning techniques to assess supply security constraints. Deterministic criteria are used only as a trigger for further investigation. ²⁰⁰
New South Wales	DNSP-determined internal criteria	Various DNSP-defined probabilistic planning approaches. Note: New South Wales previously set prescriptive, deterministic network design and planning criteria within its DNSP licence conditions; however, these conditions were removed when the licence conditions were revised in 2014.
Victoria	DNSP-determined internal criteria	Various DNSP-defined probabilistic planning approaches.
	Electricity Distribution Code (cl. 3.1A)	Contingent obligations to develop and implement a plan to strengthen security of supply to the Melbourne CBD were introduced in March 2008 (cl. 3.1A). The plan must: <ul style="list-style-type: none"> • specify strengthened security of supply objectives for the Melbourne CBD and a date or dates by which those objectives must be met • specify the capital and other works proposed by the Melbourne CBD distributor in order to achieve the security of supply objectives for the Melbourne CBD that are specified in the plan; and • meet the regulatory test.²⁰¹
Northern Territory	DNSP-determined internal criteria Electricity Reform Act 2000 (cl. 66A and Schedule 2)	The Electricity Reform Act requires the network business to develop a Network Technical Code and Network Planning Criteria. The Act prescribes what the Network Planning Criteria must include (including contingency criteria), but not the characterisation or thresholds/boundaries for the criteria themselves. PowerWater's Network Technical Code sets internal targets for the restoration of supply following N-1 events in most areas, with N-2 targets for the Darwin CBD. ²⁰²
South Australia	DNSP-determined internal criteria ²⁰³	Criteria expressed as probabilistic 'N' or 'N-1' standards with impacts (level of demand at risk, and restoration times in some cases). The likelihood and consequence of an asset failure are considered in establishing the planning criteria limits and a risk margin is generally applied to achieve a balance between minimising customer supply risk and capital expenditure and to maintain reliability levels. ²⁰⁴

²⁰⁰ Evoenergy, *Annual Planning Report 2018*, 21 December 2018, p. 27.

²⁰¹ Essential Services Commission, *Electricity Distribution Code*, version 9A, August 2018, cl. 3.1A.

²⁰² See, PowerWater, *Power Networks Network Technical Code and Network Planning Criteria*, version 3.1, December 2013, pp. 124–27.

²⁰³ In 2019, ESCOSA introduced customer-level restoration targets following outages; however, these are not considered network security planning criteria.

²⁰⁴ SA Power Networks, *Distribution Annual Planning Report 2018/19 to 2022/23*, p. 34.

<i>Jurisdiction/DNSP</i>	<i>Source</i>	<i>Requirements</i>
		The timing to implement solutions for assets overloaded for N-1 contingency events considers both the likelihood and consequence of such an event and the amount and type of customer load at risk. ²⁰⁵
Tasmania	DNSP-determined internal criteria	TasNetworks' reliability planning requirements are driven by the SAIDI and SAIFI targets set under the Tasmanian Electricity Code. To minimise outage impact on reliability, TasNetworks plans sub-transmission network and zone substations to firm (N-1) reliability. Switched firm (transferring interrupted load to an alternate supply in a short time) is generally acceptable. ²⁰⁶ Security of supply criteria for the transmission network are prescribed (Electricity Supply Industry (Network Planning Requirements) Regulations 2018).
Western Australia	DNSP-determined internal criteria	Chapter 12 and Appendix 6 of the Electricity Networks Access Code 2004 requires Western Power to develop 'Technical Rules', which must include network planning criteria. Technical Rules are subject to consultation and approval by the ERA.
	Electricity Networks Access Code 2004	The Technical Rules prescribe that the Network Service Provider may, unless good electricity industry practice dictates otherwise, design and operate the distribution system to the N-0 criterion. ²⁰⁷ The Technical Rules also include discrete design requirements for Perth CBD and Urban distribution feeders that prescribe specific switching and load transfer methods.
	Electricity Industry (Network Quality and Reliability of Supply) Code 2005 (ss. 13A, 13B and 13C).	DNSP must have in place arrangements to restore and maintain a prescribed minimum level of end customer demand (either 45 MW or 50 MW, depending on the region) following outages of a transmission element. These obligations relate to load supplied to essential services and small customers in the Eastern Goldfields and North Country regions.

Recent reliability reviews

In reviewing the MSS to apply for the 2020–25 period, we have considered the approaches and minimum reliability levels adopted in other jurisdictions.

In January 2019, ESCOSA released its final decision on network reliability standards for SA Power Networks. The final decision required SA Power Networks to maintain reliability at current levels.²⁰⁸ As part of its review, ESCOSA carried out a customer survey and completed an economic assessment of the value of setting standards to improve reliability. Overall, ESCOSA found customers were satisfied with reliability outcomes and had limited willingness to pay for improved reliability. In addition, there was no clear economic benefit in setting standards to improve reliability.²⁰⁹

²⁰⁵ SA Power Networks, *Distribution Annual Planning Report 2018/19 to 2022/23*, p. 34.

²⁰⁶ TasNetworks, *Annual Planning Report 2018*, p. 65.

²⁰⁷ Western Power, *Technical Rules for the South West Interconnected Network*, 1 December 2016, cl. 2.5.5.1

²⁰⁸ ESCOSA, *SA Power Networks reliability standards review*, final decision, January 2019, p. 10.

²⁰⁹ ESCOSA, *SA Power Networks reliability standards review*, final decision, January 2019, p. 14–15.

ESCOSA did, however, make adjustments to the measurements of network reliability. Adjustments included updating feeder definitions and revising the exclusions from reliability measurement to align with the AER's STPIS and Distribution Reliability Measures Guideline.²¹⁰

While IPART has only recently begun its review of distribution reliability standards, in August 2016 it completed a review of the transmission reliability standards to apply for the regulatory period starting 1 July 2018. IPART recommended standards for each bulk supply point across the transmission network, with the level of redundancy and allowance for expected unserved energy differing across the bulk supply points to reflect differences in the cost of providing reliability and the mix of customers.²¹¹ Notably, this assessment reflected a change in approach by shifting from reliability standards heavily based on network capability towards standards that focus on customer value of reliability.²¹²

²¹⁰ ESCOSA, *SA Power Networks reliability standards review*, final decision, January 2019, pp. 18, 20.

²¹¹ IPART, *Electricity transmission reliability standards, an economic assessment*, final report, August 2016, p. 2.

²¹² IPART, *Electricity transmission reliability standards, an economic assessment*, final report, August 2016, p. 9.