

Discussion paper

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

February 2019

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SUBMISSIONS

Closing date for submissions: 22 March 2019

Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (QCA). Therefore submissions are invited from interested parties concerning its assessment of recommended network reliability standards. The QCA will take account of all submissions received within the stated timeframes.

Submissions, comments or inquiries regarding this paper should be directed to:

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Confidentiality

In the interests of transparency and to promote informed discussion and consultation, the QCA intends to make all submissions publicly available. However, if a person making a submission believes that information in the submission is confidential, that person should claim confidentiality in respect of the document (or the relevant part of the document) at the time the submission is given to the QCA and state the basis for the confidentiality claim.

The assessment of confidentiality claims will be made by the QCA in accordance with the *Queensland Competition Authority Act 1997*, including an assessment of whether disclosure of the information would damage the person's commercial activities and considerations of the public interest.

Claims for confidentiality should be clearly noted on the front page of the submission. The relevant sections of the submission should also be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two versions of the submission (i.e. a complete version and another excising confidential information) could be provided.

A confidentiality claim template is available on request. We encourage stakeholders to use this template when making confidentiality claims. The confidentiality claim template provides guidance on the type of information that would assist our assessment of claims for confidentiality.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at our Brisbane office, or on our website at www.qca.org.au. If you experience any difficulty gaining access to documents please contact us on (07) 3222 0555.

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TASK, TIMING AND CONTACTS

The Minister for Natural Resources, Mines and Energy has directed the Queensland Competition Authority (QCA) under section 253AA of the *Electricity Act 1994* to prepare a written report setting out recommended reliability standards for Energex and Ergon Energy for the period 1 July 2020 until 30 June 2025. A copy of the Minister's direction notice is provided at Appendix A.

Key dates

The QCA's timetable for this review is shown below.

<i>Milestone</i>	<i>Date</i>
Discussion paper released	28 February 2019
Submissions on discussion paper close	22 March 2019
Draft report due	1 May 2019
Submissions on draft report close	22 May 2019
Final report due	30 June 2019

Request for comments

This discussion paper provides relevant background and information to assist stakeholders prepare submissions, including a range of consultation questions. The QCA encourages interested parties to consider these matters when making submissions to this review.

Registration of interest

You can register your interest in this review by subscribing to the QCA's electricity alerts at www.qca.org.au/subscribe

Contacts

Enquiries regarding this project should be directed to:

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1 INTRODUCTION

1.1 Background

On 6 February 2019, the QCA received a direction from the Minister for Natural Resources, Mines and Energy (the Minister) 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.

The network reliability standards are constituted as a set of performance, planning and reporting obligations and standards that form conditions of Energex and Ergon Energy's distribution authorities. The distribution authorities are licences issued by the Department of Natural Resources, Mines and Energy that authorise Energex and Ergon Energy to supply electricity within defined distribution areas.

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

1.2 Network reliability arrangements in Queensland

Minimum service standards (MSS)

The MSS are network reliability standards that establish limits for the duration and frequency of distribution network outages. They include two measures of reliability that measure 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 calculated 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 calculated as the total number of all customer interruptions, divided by the total number of customers, recorded for each feeder type.

The MSS 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. Energex's SAIDI and SAIFI limits 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 events, such as severe storms, are excluded when determining whether the SAIDI or SAIFI limit has been exceeded.

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

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.

Worst performing feeder 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 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 worst performing feeders, 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.

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.

1.3 Broader regulatory context

Since 1 July 2010, the Australian Energy Regulator (AER) has been responsible for the economic regulation of Energex and Ergon Energy.

The AER's role includes making 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 has commenced, with Energex and Ergon Energy submitting regulatory proposals to the AER on 31 January 2019.

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

1.4 Review requirements

This review is being undertaken in accordance with the direction issued by the Minister of Natural Resources, Mines and Energy under section 253AA of the *Electricity Act 1994* (see Appendix A).

Specifically, the QCA has been asked to provide a report setting out recommended reliability standards for Energex and Ergon Energy (including Ergon Energy's Mt Isa – Cloncurry network) for the period of 1 July 2020 until 30 June 2025.

The Minister's direction requires the QCA's report to include recommendations on the following:

- the System Average Interruption Frequency Index (SAIFI) limits and the System Average Interruption Duration Index (SAIDI) limits which Energex and Ergon Energy are to comply with for the period 1 July 2020 to 30 June 2025
- 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)
- 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
- whether the safety net component of the Ergon Energy distribution authority should be amended.

In addition, the report should:

- assess how effectively the MSS framework has functioned as a mechanism to achieve network reliability outcomes
- examine whether Queensland's network reliability arrangements should be reformed, taking into account the functions performed by the STPIS.

In undertaking the review, the QCA has been directed to have regard to:

- the amount customers are willing to pay to increase reliability above current levels
- the past performance of Energex and Ergon Energy in terms of reliability
- the financial and pricing consequences resulting from any changes to reliability standards.

In reaching its findings, the direction requires the QCA to:

- undertake stakeholder consultation with relevant consumer groups, electricity distributors and any other stakeholders the QCA deems appropriate
- 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
- consider the previous reviews of electricity distribution reliability levels undertaken in Queensland since 2004.

Other considerations

In addition to the requirements of the Minister's terms of reference, the QCA will also have regard to broader principles relating to network reliability emerging from policy reform that has taken place in recent years. For example, the QCA considers it relevant to have regard to the National Electricity Network Reliability Principles that were endorsed by the Council of Australian

Governments (COAG) Energy Council in December 2014² and the Distribution Reliability Measures Guideline published by the AER.³

Jurisdictional regulators have undertaken considerable work into network reliability standards in recent years. The QCA will also have regard to these bodies of work during its review, where relevant.

1.5 Request for comments

This discussion paper represents the first stage of public consultation in the QCA's review process. To assist stakeholders in providing feedback to this review, the QCA has prepared a range of relevant consultation questions, as set out in Table 1. The QCA encourages interested parties to consider these matters when making submissions to this review.

Table 1 Consultation questions

#	Question
Reliability performance and customer preferences	
1	Are customers satisfied with the current level of reliability? Do customers consider the balance between reliability and the price of electricity is appropriate?
2	Do the current MSS limits remain appropriate for the 2020–25 period?
3	Do stakeholders agree with the findings and themes emerging from recent customer surveys conducted by Energy Queensland and others? If not, why?
4	If changes to existing MSS limits are warranted, what changes should be made and by what means should these be determined?
MSS definitions	
5	Should any changes be made to the definitions of SAIFI and SAIDI (and relevant supporting definitions) in the distribution authorities for consistency with the AER's STPIS?
6	Should the definitions of SAIDI and SAIFI be amended to exclude planned interruptions?
7	What are the benefits or detriments to DNSPs and/or customers of excluding planned interruptions when determining SAIFI and SAIDI performance?
8	Would stakeholders have concerns about the frequency and duration of planned interruptions if planned interruptions are excluded from the calculation of SAIFI and SAIDI performance?
9	If planned interruptions were excluded from the calculation of SAIFI and SAIDI, should the SAIFI and SAIDI MSS limits be recalibrated to reflect this? If so, how?
10	Should the distribution authorities be amended so that interruptions of less than three minutes duration are excluded from the calculation of SAIFI and SAIDI, consistent with the AER's STPIS?
11	Should any other amendments be made to the MSS exclusions in the distribution authorities, for consistency with the AER's STPIS?
12	Should the feeder type definitions in the distribution authorities be amended to be consistent with the AER's STPIS?

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

³ Australian Energy Regulator (AER), *Distribution Reliability Measures Guideline*, November 2018.

#	Question
Worst performing feeders	
13	Should the worst performing feeder requirements be made consistent between Energex and Ergon Energy?
14	Are there any other matters that the QCA should have regard to when considering potential amendments to the worst performing feeder requirements?
Service safety net targets	
15	Should the safety net provisions be amended for the 2020–25 period? If so, how should they be amended?
16	Are there any other matters that the QCA should have regard to when considering potential amendments to the safety net provisions?
Network reliability frameworks	
17	How successful has the network reliability framework (MSS, service safety net target provisions, and worst performing feeder provisions) been in delivering reliability improvements for Energex and Ergon Energy?
18	Is the MSS the right framework to achieve desired reliability performance outcomes?
19	To what extent have the DNSP's reliability-targeted expenditures been driven by the STPIS?
20	Has the STPIS contributed to improved SAIDI and SAIFI performance outcomes?
21	Should the MSS framework be reformed in any way, taking into account the functions of the STPIS?

2 SETTING MINIMUM SERVICE STANDARDS FOR 2020–25

A key element of this review is to develop recommended SAIFI and SAIDI MSS limits that Energex and Ergon Energy are to comply with for the period 1 July 2020 to 30 June 2025.

The QCA is also required to recommend whether the definitions and exclusions for SAIFI and SAIDI included in the distribution authorities should be amended to align with the corresponding definitions used in the AER's STPIS.

This chapter discusses the background to the MSS and introduces some key considerations in determining whether the MSS limits, and relevant definitions, should be changed for the 2020–25 period.

2.1 History of the MSS

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.⁴ The EDSD review was initiated by the Queensland Government following extended network outages due to storms and extreme heat in early 2004. The 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 improvements set by the QCA in 2009 were still necessary, or whether the networks could be considered reliable.⁵

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.

⁴ Independent Panel of the Electricity Distribution and Service Delivery Review, *Electricity distribution and service delivery for the 21st century*, July 2004.

⁵ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, November 2011, p. 44.

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.⁶

QCA review of MSS, 2014

In August 2013, the QCA commenced a review of the MSS and GSL 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)⁷ 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;⁸ 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.⁹

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.¹⁰

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 framework.¹¹

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.

⁶ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, November 2011, p. 45.

⁷ The IRPNC was engaged by the Queensland Government's Interdepartmental Committee on Electricity Sector Reform (IDC) to investigate the drivers of network costs and provide recommendations to reduce the impact of network charges on retail electricity prices.

⁸ Independent Review Panel on Network Costs (IRPNC), *Electricity network costs review*, final report, December 2012, p. 43.

⁹ IRPNC, *Electricity network costs review*, final report, December 2012, p. 45.

¹⁰ However, the then Minister proposed that the QCA may be directed to conduct a review of the MSS where required.

¹¹ 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.

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. This is because reliability-related expenditures are ultimately recovered through regulated network charges, which are passed on to customers through retail electricity prices.

As a general principle, 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.¹² Where that can be established, it should also be 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 will have regard to the following matters, as required by the Minister's direction:

¹² While the terms of reference do 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).

- 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.

In addition to these considerations, the QCA will have regard to the matters discussed in section 1.4, among other matters, where relevant.

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.

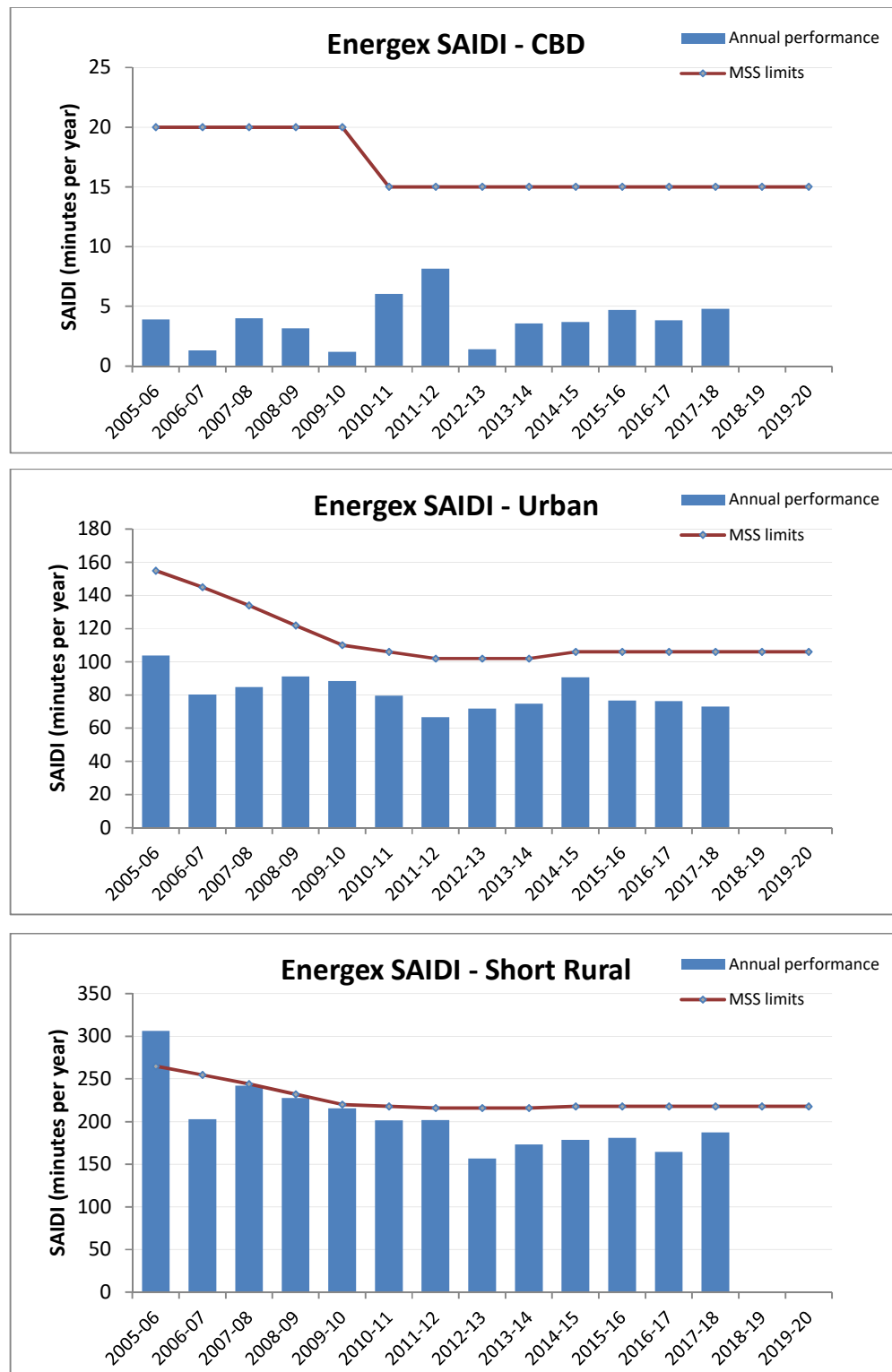
Energex

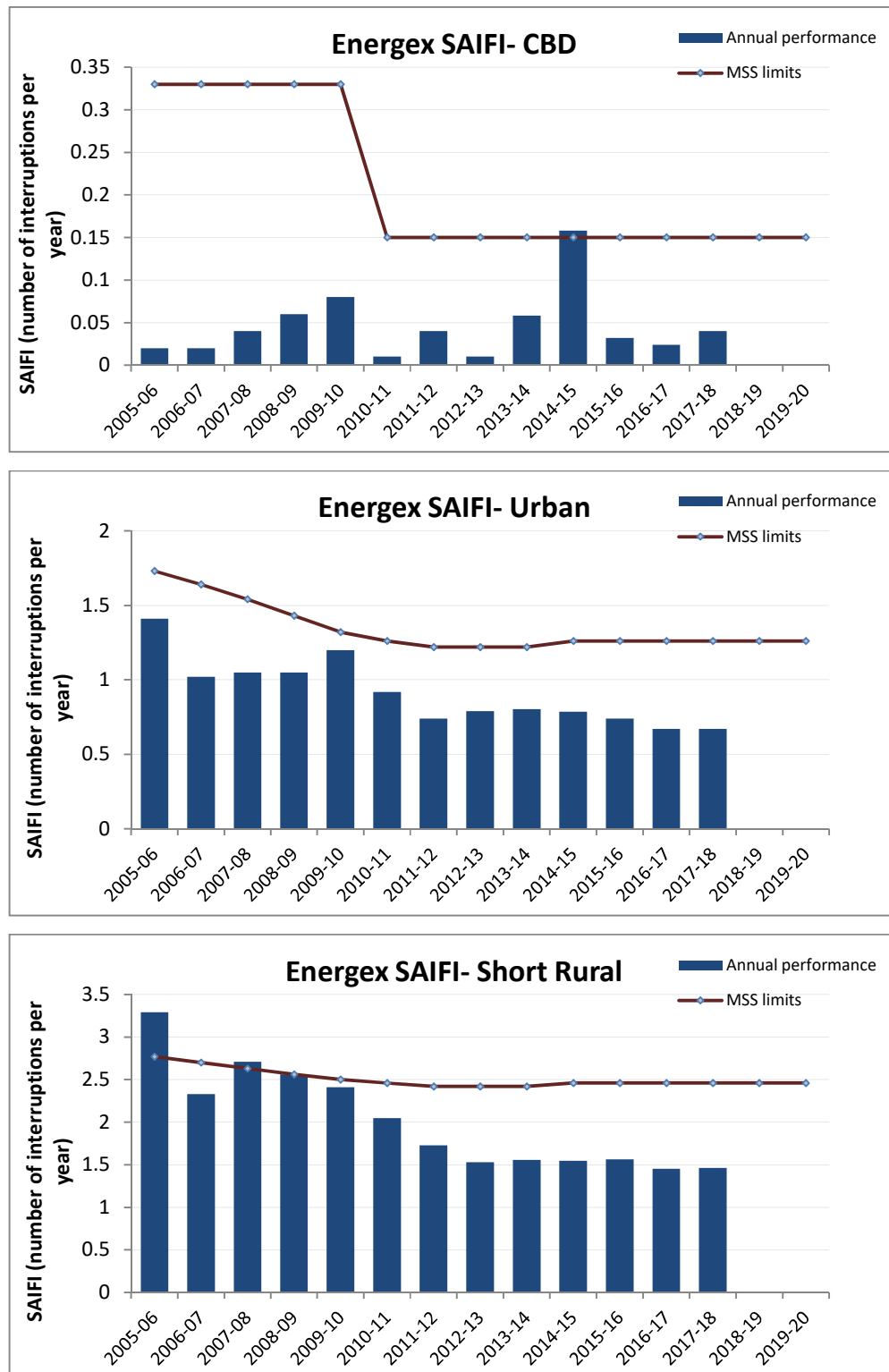
Energex's performance against the MSS limits shows improvement in annual SAIFI performance for both urban and short rural feeder types since 2005–06 (Figure 1). While not as significant, this is also the case for SAIDI performance.

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 2015.¹³ Annual performance has since returned to levels well within the MSS limits.

¹³ 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.

Figure 1 Energex SAIDI and SAIFI performance



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

Ergon Energy

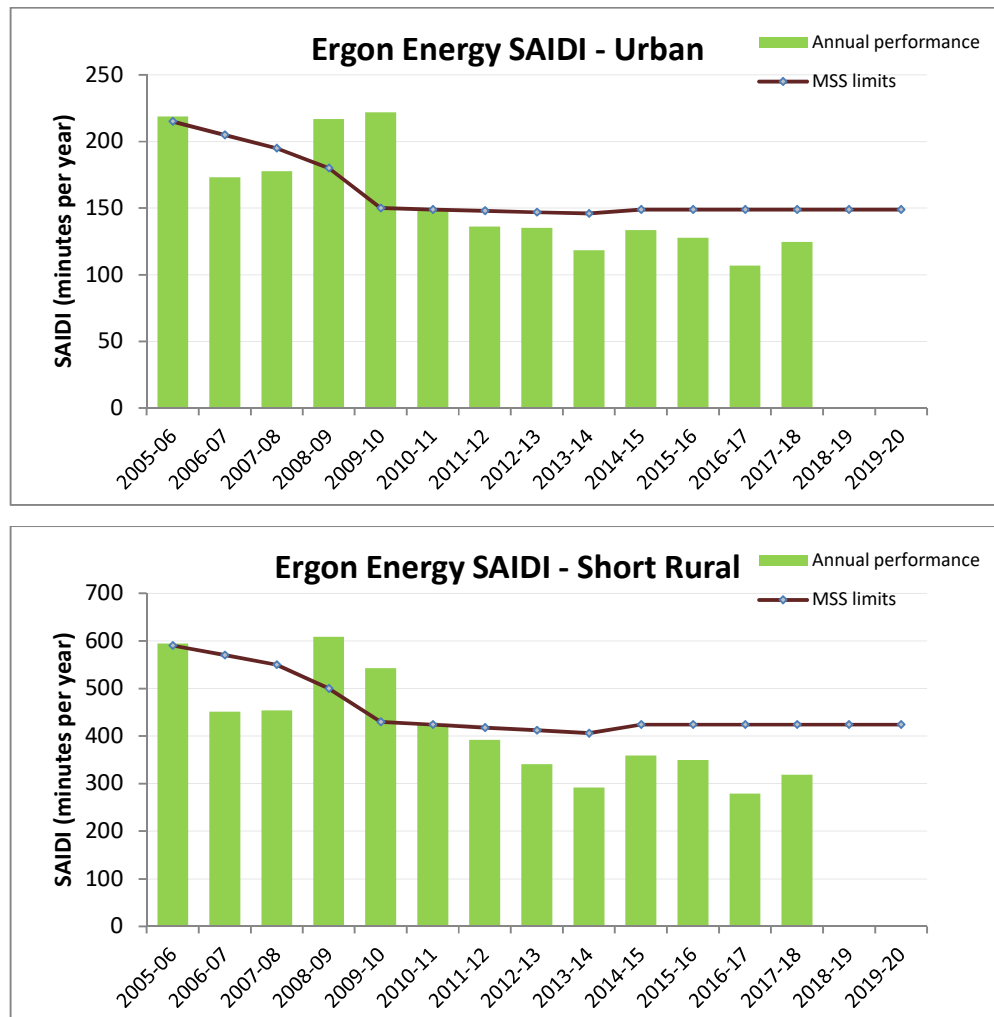
While Ergon Energy was in breach of its MSS limits on a number of occasions prior to 2010–11, there have been improvements in both SAIDI and SAIFI performance since then (Figure 2). Ergon Energy has realised notable improvements in urban and short rural feeder performance since

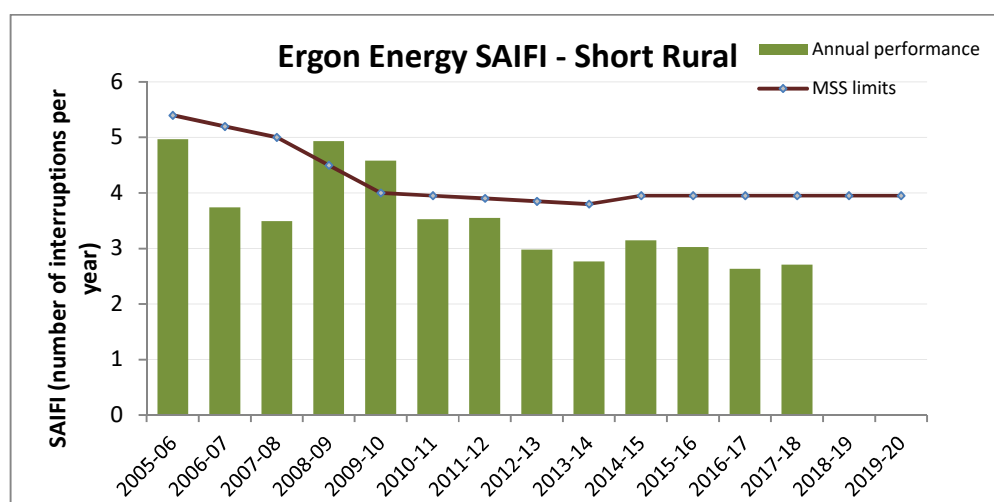
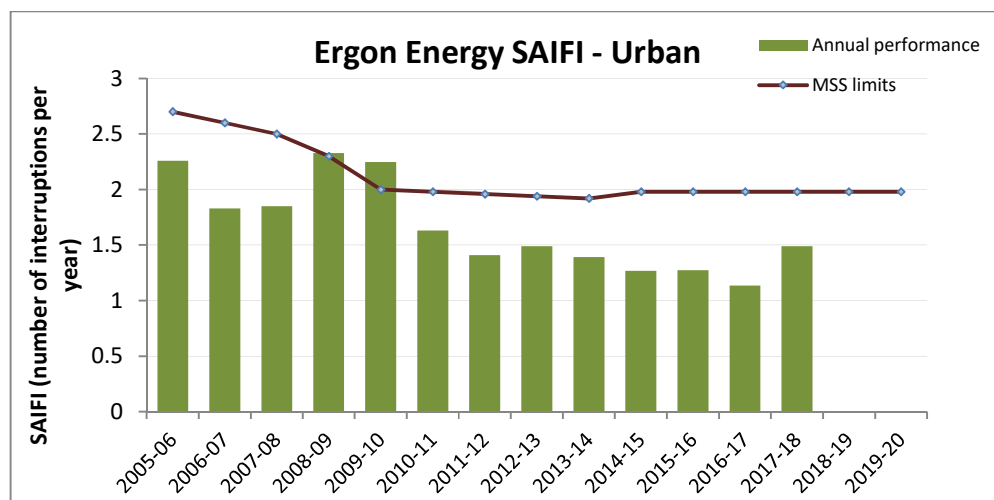
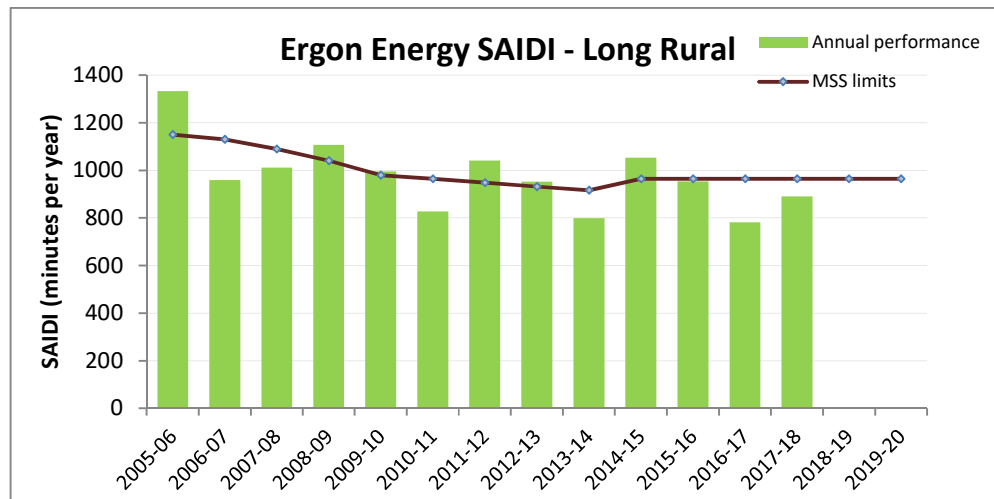
2009–10, and has remained comfortably within the SAIDI and SAIFI limits for these feeder types since that time.

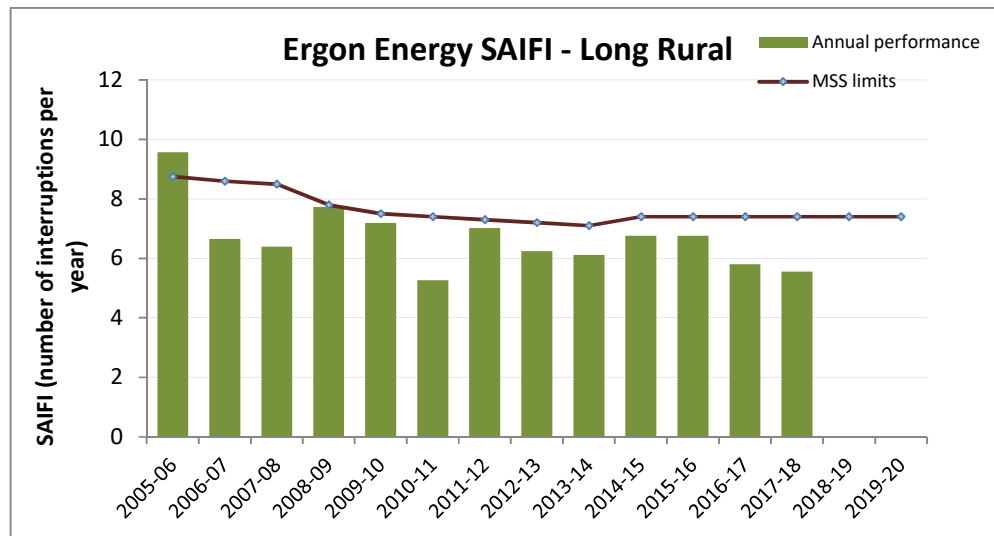
Ergon Energy's long rural SAIDI performance reveals considerable year-to-year variability, with performance not consistently remaining within the MSS limits. Performance of long rural feeders in 2014–15 breached the MSS SAIDI limits, with performance in 2015–16 just within the limit. Ergon Energy's SAIDI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

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

Figure 2 Ergon Energy SAIDI and SAIFI performance







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 terms of reference require the QCA to have regard to the costs and benefits of delivering improved reliability, specifically:

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

The costs and benefits of reliability outcomes can be examined from the perspectives of DNSPs and customers. At a high level, the benefits of reliability are reflected in the value that customers place on a given level of reliability. The costs of reliability reflect the costs that the distribution networks incur in delivering that level of reliability.

Costs of reliability

Reliability-related expenditure is only one component of network expenditure, and it is not currently the most significant driver of network costs in Queensland. Network costs are also only one component of the overall price of electricity paid by consumers. 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 distributors to incur additional capital and/or operating costs. These costs may include investment in network augmentation and reinforcement, and operating costs to deliver enhanced inspection, maintenance and vegetation management programs, for example.

Benefits of reliability

Estimating the benefits of reliability for customers is often achieved using survey and statistical methods, such as 'willingness to pay/accept', or 'value of customer reliability' studies. These studies may be either qualitative or quantitative and are designed to reveal the value that customers place on a reliable electricity supply.

Energy Queensland recently undertook significant customer research of this nature, which the Minister's direction requires the QCA to consider.¹⁴ The QCA considers that this, and other recent consumer research, is directly relevant to understanding the attitudes of Queensland electricity customers toward reliability and affordability.

For example, 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 2017.¹⁵ This fell in 2018 to 41 per cent across Queensland.¹⁶ These findings were supported by the Chamber of Commerce and Industry Queensland, which noted 'small business has clearly articulated that affordability is the most pressing concern when it comes to energy policy'.¹⁷

At the same time, customers appear generally satisfied with overall reliability of electricity.¹⁸ Many customers have acknowledged improvements in resilience and reliability in recent years with 83 per cent of Energex and Ergon Energy's customer research respondents reporting satisfaction with the overall reliability and quality of electricity supply in 2018.^{19,20} Research conducted by Energy Consumers Australia presents similar findings, indicating that 84 per cent of Queensland customers were satisfied with the reliability of their supply.²¹

The Queensland Household Energy Survey 2017 found 72 per cent of respondents across Queensland (including those in regional areas) considered the existing balance between cost and reliability about right.²² While Energex and Ergon Energy's customer research in 2018 found Energex customers appear 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 in line with inflation.²³ Furthermore, some customers believed that a 2 per cent price increase would deliver negligible reliability improvements. Customers had more confidence that a larger bill increase of 5 per cent would deliver better reliability and resilience; however, there was limited tolerance for such an increase.²⁴

Customers have also acknowledged the need to ensure that network reliability and resilience does not deteriorate, with Queensland industries in particular highlighting the importance of a

¹⁴ Energy Queensland's customer research is available at: <https://www.talkingenergy.com.au/haveyoursay>.

¹⁵ Colmar Brunton, *Queensland Household Energy Survey 2017, Insights Report*, prepared for Energy Queensland & Powerlink, 2018, p. 7.

¹⁶ Energy Queensland, *Future Energy Survey 2018*, 2018, p. 7.

¹⁷ Chamber of Commerce and Industry Queensland, submission to Energy Queensland, *Energy Queensland Draft Plans 2020–25*, September 2018, p. 2.

¹⁸ Energy Consumers Australia, *Energy Consumer Sentiment Survey*, June 2018, p. 73.

¹⁹ Energy Queensland, *Future Energy Survey 2018*, 2018, p. 2.

²⁰ Kantar Public & PwC, *AER (2020 – 2025) Customer Research, Qualitative Research Report, prepared for Energy Queensland*, prepared for Energy Queensland, June 2018, p. 5.

²¹ Energy Consumers Australia, *Energy Consumer Sentiment Survey*, December 2018, p. 15.

²² Colmar Brunton, *Queensland Household Energy Survey 2017, Insights Report*, prepared for Energy Queensland & Powerlink, 2018, p. 18.

²³ Kantar Public & PwC, *AER (2020 – 2025) Customer Research, Qualitative Research Report*, prepared for Energy Queensland, June 2018, p. 48–49.

²⁴ Kantar Public & PwC, *AER (2020 – 2025) Customer Research, Qualitative Research Report*, prepared for Energy Queensland, June 2018, p. 48.

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 to electricity prices.²⁵

Based on its customer research, Energy Queensland has suggested that the MSS limits should remain unchanged for the 2020–25 period.

The QCA intends to consider these and other studies in further detail during its review. We also encourage stakeholders to examine the research conducted by Energy Queensland and welcome stakeholder views on its findings.

Balancing the costs and benefits of improved reliability

Many factors influence the value that individual customers place on reliability. However, as a general rule, 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.²⁶ Eventually, network reliability outcomes will approach a point where the cost of delivering even better reliability outcomes outweighs the benefit that customers would derive from that reliability. Beyond this point, it typically becomes inefficient for DNSPs to pursue further reliability improvements, at least from an average reliability perspective.²⁷

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 ten 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.

At the same time, the introduction of tighter reliability standards in 2005 has driven the DNSPs to actively seek opportunities to improve reliability. These efforts have delivered significant reliability improvements. At some point, opportunities for low-cost reliability 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 at their current levels would preserve the existing level of performance that customers appear largely satisfied with, while having no material impact on costs, other things being constant. Nonetheless, should there be a compelling case for changing the MSS limits for the 2020–25 period, the QCA will consider an appropriate basis for doing so.

In considering the trade-off between reliability preferences and costs, we consider that the recent customer research conducted by Energy Queensland is highly relevant to our consideration of customers' willingness to pay for improved reliability. The QCA will also engage with the DNSPs to understand the costs of delivering the level of reliability expected by customers, to determine whether any change to the MSS is warranted, and if so, whether this would result in a more efficient level of reliability than is currently being delivered.

²⁵ Kantar Public & PwC, *AER (2020 – 2025) Customer Research, Qualitative Research Report*, prepared for Energy Queensland, June 2018, p. 51.

²⁶ 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.

²⁷ Further reliability improvements may still be efficient in some parts of the network, for example, worst performing feeders.

Consultation questions

- (1) Are customers satisfied with the current level of reliability? Do customers consider the balance between reliability and the price of electricity is appropriate?
- (2) Do the current MSS limits remain appropriate for the 2020–25 period?
- (3) Do stakeholders agree with the findings and themes emerging from recent customer surveys conducted by Energy Queensland and others? If not, why?
- (4) If changes to existing MSS limits are warranted, what changes should be made and how should they be determined?

2.3 Definitions and exclusions

2.3.1 SAIDI and SAIFI definitions

The QCA has been directed to recommend 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 corresponding definitions used in the AER's STPIS. Both DNSPs have expressed support for closer alignment of the MSS definitions and exclusions with the AER's STPIS.

Under the distribution authorities, SAIDI and SAIFI represent 'System Average Interruption Duration Index' and 'System Average Interruption Frequency Index' respectively.²⁸ The 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).

Under the AER's STPIS, the equivalent definitions are expressed as follows:

- Unplanned SAIFI (System Average Interruption Frequency Index) means 'the total number of unplanned sustained customer interruptions, divided by the Customer Base'. Unplanned SAIFI excludes momentary interruptions (three minutes or less). SAIFI is expressed per 0.01 interruptions.
- Unplanned SAIDI (System Average Interruption Duration Index) means 'the sum of the duration of each unplanned sustained customer interruption (in minutes), divided by the Customer Base'. Unplanned SAIDI excludes momentary interruptions (three minutes or less).

The STPIS also includes a number of supporting definitions and notes that provide additional detail about the calculation of these measures.²⁹

Consultation questions

- (5) Should any changes be made to the definitions of SAIFI and SAIDI (and relevant supporting definitions) in the distribution authorities for consistency with the AER's STPIS?

In addition, the QCA is seeking stakeholder comments on several other issues associated with the definitions of SAIFI and SAIDI, as outlined below.

²⁸ See clause 1 of the distribution authorities.

²⁹ See AER, *Electricity distribution network service providers Service Target Performance Incentive Scheme, Version 2.0*, November 2018, pp. 25–26.

2.3.2 Planned and unplanned interruptions

A key difference between the distribution authorities and the AER's STPIS is in the treatment of planned interruptions (that is, 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 AER's 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.

The QCA is seeking stakeholder views on whether or not Energex's and Ergon Energy's distribution authorities should be amended to exclude planned interruptions for the purposes of setting, and reporting against, the SAIFI and SAIDI MSS limits.

Excluding planned interruptions for Queensland's MSS definitions would harmonise the treatment of this type of interruption with the AER's STPIS, which should have benefits for the DNSPs from a regulatory compliance and reporting perspective.

The QCA also notes that, if planned interruptions were excluded from the calculation of SAIFI and SAIDI for the 2020–25 period, the reported reliability performance of Energex and Ergon Energy could appear more favourable against the MSS limits, other things remaining constant. In the event that the MSS limits are fixed at their current levels for the 2020–25 period, excluding planned interruptions from reported performance would have the effect of relaxing the MSS limits in relative terms. To overcome this, the MSS limits may need to be recalibrated to account for this change in definitions to ensure the same relative reliability standards are maintained.

However, Queensland's MSS arrangements do not necessarily need to be aligned with the AER's STPIS in its treatment of planned interruptions.

A difference in approach between Queensland's MSS arrangements and the AER's STPIS could be 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.

The QCA is interested in stakeholder views on whether the current approach towards planned interruptions in the distribution authorities should be maintained, or whether the distribution authorities should be amended to exclude planned interruptions.

Consultation questions

- (6) Should the definitions of SAIDI and SAIFI be amended to exclude planned interruptions?
- (7) What are the benefits or detriments to DNSPs and/or customers of excluding planned interruptions when determining SAIFI and SAIDI performance?
- (8) Would stakeholders have concerns about the frequency and duration of planned interruptions if planned interruptions are excluded from the calculation of SAIFI and SAIDI performance?
- (9) If planned interruptions were excluded from the calculation of SAIFI and SAIDI, should the SAIFI and SAIDI MSS limits be recalibrated to reflect this? If so, how?

2.3.3 Momentary interruptions

A further point of difference between the distribution authorities and the AER's STPIS is the minimum duration of an interruption for the purposes of calculating SAIFI and SAIDI.

In the distribution authorities, interruptions of less than one minute are excluded from the calculation of SAIFI and SAIDI.³⁰ 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 AER's STPIS was amended to increase the duration of what are considered momentary interruptions from less than one minute to less than three minutes.³¹ 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.³²

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.³³

Adopting the three-minute threshold in Queensland's MSS arrangements could provide those same incentives for Energex and Ergon Energy. It may also have benefits from a regulatory reporting and compliance perspective by providing a consistent threshold at the state and Commonwealth levels for determining an interruption for the purposes of SAIFI and SAIDI.

³⁰ Clause 9.3(a) of each distribution authority.

³¹ AER, *Amendment to the Service Target Performance Incentive Scheme*, final decision, November 2018, pp. 16–17.

³² AEMC, *Review of distribution reliability measures*, final report, September 2014, pp. 12–13.

³³ ESCOSA, *SA Power Network's reliability standards review*, 2019, p. 32.

Consultation questions

- (10) Should the distribution authorities be amended so that interruptions of less than three minutes duration are excluded from the calculation of SAIFI and SAIDI, consistent with the AER's STPIS?

2.3.4 Other exclusions

A number of other interruptions in both the distribution authorities³⁴ and the AER's STPIS are excluded when calculating SAIFI and SAIDI performance.³⁵

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').

Further differences between the exclusions permitted under the two frameworks are set out in Appendix B.

The QCA is interested in stakeholder views on whether any changes should be made to the exclusions under the distribution authorities for consistency with the AER's STPIS. Differences between the exclusions include:

- While both the distribution authorities and the AER's STPIS have a 'major event day' exclusion, the STPIS includes a more detailed set of provisions for the calculation and application of the exclusion.³⁶ Also, unlike Queensland's MSS arrangements, the STPIS is based on unplanned interruption performance only.
- While both the distribution authorities and the AER's STPIS have an exclusion for interruptions due to a direction from emergency services, the STPIS includes a fault element. This means that the exclusion will not apply if the event giving rise to the direction was caused (in whole or in part) by a fault with the network or its operation.
- The distribution authorities include an exclusion for interruptions caused by a customer's electrical installation or failure of that electrical installation. This exclusion is not included in the AER's STPIS.
- The AER's STPIS includes an exclusion for interruptions caused by a failure of transmission connection assets. This exclusion is not included in the distribution authorities.
- The AER's STPIS also includes an exclusion for interruptions caused by the exercise of any obligation, right or discretion under jurisdictional or national electricity legislation applying to a DNSP.

³⁴ Clause 9.3 of each distribution authority.

³⁵ Clause 3.3 of the AER's STPIS, November 2018.

³⁶ See Appendix D of the AER's STPIS, November 2018.

Consultation questions

- (11) Should any other amendments be made to the MSS exclusions in the distribution authorities for consistency with the AER's STPIS?

2.3.5 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 AER's STPIS, namely:

- CBD feeders
- urban feeders
- short rural feeders
- long rural feeders.³⁷

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 the respective networks of Energex and Ergon Energy.

However, a notable difference is the definition of 'urban feeder', which has recently been amended in the AER's STPIS. In determining whether a feeder is classified as 'urban', 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).³⁸

Definitions for the remaining feeder types also differ to some extent between the distribution authorities and the STPIS (illustrated in Appendix B).

Consultation questions

- (12) Should the feeder type definitions in the distribution authorities be amended to be consistent with the AER's STPIS?

³⁷ Clause 1 of the distribution authorities; AER, STPIS, November 2018, p. 28.

³⁸ AEMC, *Review of distribution reliability measures*, final report, September 2014, pp. 34–35.

3 WORST PERFORMING FEEDERS

The SAIDI and SAIFI MSS limits are targeted at ensuring the DNSPs 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 'worst performing feeders', 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.³⁹

The current obligations regarding worst performing feeders (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 worst performing feeder 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 '11kV 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 feeder improvement obligations are based on SAIDI outcomes, while Energex's obligations appear to be based on SAIDI and/or SAIFI outcomes.
- To be classified as a worst performing feeder, 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 'worst performing feeder' is expressed as percentile performance ranking for Energex (within the worst 10% of feeders by performance), and an absolute value for Ergon Energy (within the 50 worst performing feeders, except those serving less than 20 customers).
- Under clause 11.2(c)(i) of both distribution authorities, 'three-year average' performance applies to different criteria for defining a worst performing feeder (percentile measure for Energex, and percentage exceedance measure for Ergon Energy).

³⁹ Clause 11.1 of the distribution authorities.

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 11kV 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 11kV 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)	<p>The worst performing 11kV feeder program will apply to any 11kV feeder which meets the following criteria:</p> <p>(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</p> <p>(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.</p>	<p>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:</p> <p>(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</p> <p>(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.</p>

Sources: Distribution authorities, clause 11.2.

Energy Queensland has suggested there is merit in making the worst performing feeder requirements consistent between Energex and Ergon Energy. It suggested that both distribution authorities should be amended such that the worst performing feeder 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.

The QCA welcomes stakeholder views on whether the worst performing feeder requirements should be aligned for both DNSPs.

Consultation questions

- (13) Should the worst performing feeder requirements be made consistent between Energex and Ergon Energy?
- (14) What other matters should the QCA have regard to when considering potential alignment of the worst performing feeder requirements?

4 SERVICE SAFETY NET TARGETS

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., failure of a bulk supply point or zone substation) that 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.⁴⁰

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 through the duplication of critical assets. For example, the impact of outages following N-1 events can be minimised by switching operations, network reconfiguration, and deployment of 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 distribution annual planning reports.

Currently, the distribution authorities prescribe different safety net provisions for Energex and Ergon Energy. The relevant provisions are set out in Table 7 below, highlighting the key differences. 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.⁴¹ Ergon Energy's safety net provisions do not provide for any exclusions.
- 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.

⁴⁰ Clause 10.1 of the distribution authorities.

⁴¹ 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).

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

Feeder type / Area	Restoration target following an N-1 event /Exclusions	
	Energex	Ergon Energy
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; and 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; and 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 20MVA after 1 hour; Less than 15MVA after 6 hours; Less than 5MVA after 12 hours; and 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 20MVA after 1 hour; Less than 15MVA after 8 hours; Less than 5MVA after 18 hours; and 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: <ul style="list-style-type: none"> (a) an interruption resulting from: <ul style="list-style-type: none"> (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 	n/a

Feeder type / Area	Restoration target following an N-1 event /Exclusions	
	Energex	Ergon Energy
	<p>following the occurrence of a power system under-frequency condition described in the power system security and reliability standards;</p> <p>(iv) a failure of the shared transmission grid; or</p> <p>(v) a direction by a police officer or another authorised person exercising powers in relation to public safety;</p> <p>(b) any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day; and</p> <p>(c) an interruption caused by a customer's electrical installation or failure of that electrical installation.</p>	

a. 'Regional Centre' relates to larger centres with predominantly urban feeders.

b. '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.

Potential amendments to the service safety net target provisions

Energy Queensland has suggested a range of amendments to the safety net provisions in Ergon Energy's distribution authority to better align the two DNSPs' distribution authorities. Energy Queensland suggested the following amendments be made to Ergon Energy's safety net provisions:

- 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 impact 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 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, as set out in Table 8 below.

Table 8 Ergon Energy-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 20MVA (8000 customers) after 1 hour	1. Less than 20MVA (8000 customers) after 1 hour
2. Less than 15MVA (6000 customers) after 6 hours	2. Less than 15MVA (6000 customers) after 8 hours
3. Less than 5MVA (2000 customers) after 12 hours	3. Less than 5MVA (2000 customers) after 18 hours
	4. Less than 1MVA after 48 hours

The QCA will consider the merits of potential amendments to the safety net provisions and seeks stakeholder views.

Consultation questions

- (15) Should the safety net provisions be amended for the 2020–25 period? If so, how should they be amended?
- (16) Are there any other matters that the QCA should have regard to when considering potential amendments to the safety net provisions?

5 EFFECTIVENESS OF THE NETWORK RELIABILITY FRAMEWORK

The Minister's direction requires to the QCA to assess how effectively the MSS framework has functioned as a mechanism to achieve network reliability outcomes. It also requires us to examine Queensland's network reliability arrangements, taking into account the functions performed by the STPIS.

In considering these issues, it is relevant to examine the historical reliability performance of the Queensland DNSPs, the drivers of reliability outcomes, and the roles of the network reliability framework and the STPIS.

5.1 Effectiveness of the MSS

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

The reliability performance of both DNSPs has improved markedly in recent years (discussed in section 2.2.1). Some of this improvement is likely attributable to the MSS limits and other obligations within the Queensland network reliability framework. In particular, the deterministic network security criteria (N-1) introduced in 2005 drove significant capital expenditure in the years following their introduction, which has likely had a positive impact on SAIDI and SAIFI performance.

Since 2010, the Queensland DNSPs have also been subject to the AER's STPIS mechanism, which provides financial incentives to maintain and improve service quality and reliability.

In practice, the improved reliability performance realised in recent years is likely the result of incentives and obligations created by the network reliability framework (which includes the MSS), the STPIS, and other factors. The QCA's review will further examine the drivers of performance outcomes in forming a view on the effectiveness of the MSS framework.

5.2 Network reliability framework 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 framework⁴² and STPIS. These two frameworks serve different purposes. At a high level, the AER's 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.

⁴² In this context, 'network reliability framework' is 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.

In contrast, the current network reliability framework represents a set of obligations and standards that form conditions of the DNSPs' distribution authorities. These standards establish minimum levels of performance that the DNSPs must aim to deliver. There are no direct financial incentives attached to compliance with the network reliability framework; however, repeated failure to meet these requirements can represent a breach of the distribution authority, which may carry other consequences.

The two schemes appear to provide some common incentives to deliver a reliable supply, particularly with regard to SAIDI and SAIFI performance. However, the schemes tend to encourage different approaches to delivering reliability outcomes. The network reliability framework prescribes binding standards that have a significant and direct impact on network planning and investment decisions, particularly the MSS and service safety net targets. Similarly, the worst performing feeder improvement obligations target improvements towards poor-performing feeders that may not be prioritised when targeting an average level of feeder reliability only.

Moreover, unlike the STPIS, the MSS limits within the network reliability framework represent binding minimum levels of reliability that DNSPs must aim to achieve. Systemic failure to meet the MSS represents a breach of the DNSP's distribution authority, which may result in disciplinary action or the imposition of a pecuniary civil penalty.⁴³

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.⁴⁴

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 2014.⁴⁵

Even though the network reliability framework and the STPIS appear to have distinct functions, there may be scope to reduce compliance costs associated with reporting two sets of reliability performance data. The QCA's review will explore the possibility of bringing the MSS definitions and exclusions into closer alignment with the AER's STPIS provisions, where appropriate (Chapter 2).

⁴³ 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.

⁴⁴ Independent panel of the ENCAP Review, *Electricity Network Capital Program Review 2011*, 2011, p. 46.

⁴⁵ IRPNC, *Electricity network costs review*, final report, December 2012, p. 43.

Consultation questions

- (17) How successful has the network reliability framework (MSS, service safety net target provisions and worst performing feeder provisions) been in delivering reliability improvements for Energex and Ergon Energy?
- (18) Is the MSS the right framework to achieve desired reliability performance outcomes?
- (19) To what extent have the DNSP's reliability-targeted expenditures been driven by the STPIS?
- (20) Has the STPIS contributed to improved SAIDI and SAIFI performance outcomes?
- (21) Should the MSS framework be changed in any way, taking into account the functions of the STPIS?

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)
DNSP	Distribution Network Service Provider
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
IRPNC	Independent Review Panel on Network Costs
kV	kilovolts
MSS	minimum service standards
MVA	mega volt amps
NEM	National Electricity Market
NER	National Electricity Rules
QCA	Queensland Competition Authority
SA	South Australia
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
STPIS	Service Target Performance Incentive Scheme

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:

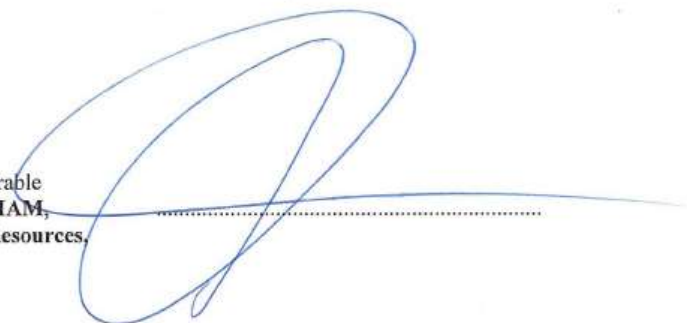
- a. undertake stakeholder consultation with relevant consumer groups, electricity distributors and any other stakeholders the QCA deems appropriate;
- b. in considering customers' willingness to pay to increase reliability above current levels, have regard to the customer engagement and research undertaken 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: DRAFTING COMPARISONS BETWEEN THE DISTRIBUTION AUTHORITIES AND AER'S STPIS

Table 9 Comparison of exclusions from SAIFI/SAIDI

<i>Queensland distribution authorities⁴⁶</i>	<i>AER's STPIS⁴⁷</i>
an interruption of a duration of one minute or less	[While not included in the list of exclusions, effectively all interruptions less than three minutes are excluded from SAIDI and SAIFI, given how they are defined]
an interruption resulting from load shedding due to a shortfall in generation	load shedding due to a generation shortfall
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	load shedding at the direction of the Australian Energy Market Operator (AEMO) or a system operator
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	automatic load shedding due to the operation of under frequency relays following the occurrence of a power system under-frequency condition
an interruption resulting from a failure of the shared transmission grid	load interruptions caused by a failure of the shared transmission network
an interruption resulting from a direction by a police officer or another authorised person exercising powers in relation to public safety	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
any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day	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) [i.e. the other listed exclusions]
an interruption caused by a customer's electrical installation or failure of that electrical installation	[No equivalent is listed]
[No equivalent is listed]	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
[No equivalent is listed]	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

⁴⁶ See clause 9.3 of the distribution authorities.

⁴⁷ See clause 3.3 of the AER's STPIS (November 2018).

Table 10 Comparison of feeder type definitions

<i>Feeder type</i>	<i>Distribution Authority</i>	<i>AER's STPIS</i>
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. ⁴⁸	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.
Long rural feeder	means a feeder which is not an urban feeder or isolated feeder ⁴⁹ and has a total feeder route length of greater than 200 km. ⁵⁰	a feeder which is not a CBD feeder, urban feeder or short rural feeder
Short rural feeder	For Energex: <ul style="list-style-type: none"> means a feeder which is not an urban feeder or CBD feeder For Ergon Energy: <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. 	a feeder which is not a CBD or urban feeder with a total feeder route length less than 200 km.
Urban feeder	For Energex: <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. For Ergon: <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. 	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.

⁴⁸ CBD feeder not used for Ergon Energy, as it has no feeders of this type.

⁴⁹ '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'.

⁵⁰ Long rural feeder is not used in Energex's distribution authority, as it has no feeders of this type.