2016 Annual Performance Report
Energy Distributors

April 2017

Economic Regulation Authority
WESTERN AUSTRALIA

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Key points for 2015-16

This is the latest in a series of annual reports[1] published by the Economic Regulation Authority that examines the performance of energy distributors that supply small use customers[2] in Western Australia.

The purpose of this report is to bring transparency and accountability to the performance of electricity and gas distribution businesses that supply small use customers.

Energy distribution market

There are three electricity distributors that supply small use customers, each operating in a different area of the state.

Western Power is the largest of the three distributors, supplying customers through its South West Interconnected System.[3] Horizon Power supplies customers through a number of distribution systems in mainland areas of the state outside the SWIS, and Rottnest Island Authority operates a small distribution system on Rottnest Island.

There are three gas distributors that supply small use customers. ATCO[4] is the largest of the three distributors, supplying natural gas to customers in the Coastal and Goldfields-Esperance supply areas and LPG[5] to customers in the Great Southern supply area.[6] Kleenheat[7] supplies LPG to customers in Leinster, Margaret River and Oyster Harbour (just east of Albany), and Esperance Power Station supplies natural gas to customers in Esperance.

Connections and reconnections

Electricity

There was a total of 1.158 million electricity distribution connections in 2015-16. Western Power's distribution system supplied 1.110 million connections, or 95.9 per cent of the total, while Horizon Power supplied 47,168 connections, or 4.1 per cent of the total.[8]

There were 33,449 new electricity connections in 2015-16, compared to 35,501 connections in 2014-15. Western Power added 32,589 new connections (down from 33,925 in 2014-15), and Horizon Power added 860 new connections (down from 1,576 in 2014-15).

Both Western Power and Horizon Power reduced the proportion of new connections that were not provided on time. In 2015-16, 0.4 per cent of Western Power's new connections

[1] Each report covers the year from 1 July to 30 June.

[2] Small use customers are residential and business customers whose annual consumption is less than 160MWh of electricity or one terajoule of gas.

[3] The SWIS covers a geographic area from Kalbarri to Albany, and from Perth to Kalgoorlie.

[4] ATCO Gas Australia.

[5] Liquified Petroleum Gas.

[6] ATCO supplies natural gas to Geraldton, Perth, the coastal areas Between Mandurah and Busselton, and Kalgoorlie-Boulder. LPG is supplied to Albany.

[7] Wesfarmers Kleenheat Gas.

[8] Rottnest Island Authority's distribution system had 527 connections in 2015-16.

were not on time (down from 0.6 per cent in 2014-15), and 0.2 per cent of Horizon Power's new connections were not on time (down from 1.0 per cent in 2014-15).

There was a total of 16,729 reconnections on electricity distributions systems, 15,202 on Western Power's system and 1,527 on Horizon Power's systems. In 2015-16, 1.0 per cent of Western Power's reconnections were not provided on time (down from 1.1 per cent in 2014-15), while all of Horizon Power's reconnections were provided on time.[9]

Gas

There was a total of 738,078 gas distribution connections in 2015-16. ATCO's distribution systems supplied 736,746 connections, or 99.8 per cent of the total, Kleenheat's distribution systems supplied 956 connections, and Esperance Power Station's distribution system supplied 376 connections.

There were 24,642 new gas connections in 2015-16, compared to 23,789 connections in 2014-15. ATCO added 24,600 new connections (up from 23,734 in 2014-15), Kleenheat added 24 new connections (down from 43 in 2014-15) and Esperance Power Station added 18 new connections (up from 12 in 2014-15).

There was a total of 10,888 reconnections on gas distribution systems, 10,875 on ATCO's systems, eight on Kleenheat's systems and five on Esperance Power Station's system. All of the reconnections were provided on time.

Electricity distribution system reliability

Electricity distributors are required to report their supply reliability performance under both the Network Quality and Reliability of Supply (**NQ&R**) Code and the Steering Committee on National Regulatory Reporting Requirements (**SCONRRR**) framework.[10]

NQ&R framework

Both Western Power and Horizon Power reported supply interruptions lasting for longer than 12 hours continuously, known as extended interruptions. In 2015-16, 1.4 per cent (down from 13.3 per cent in 2014-15) of Horizon Power's customers and 3.4 per cent (up from 3.3 per cent in 2014-15) of Western Power's customers were affected by extended interruptions. The high level of extended interruptions reported by Horizon Power in 2014-15 was due to two tropical cyclones (Olwyn and Quang).

Western Power is the only distributor supplying customers in the Perth CBD and urban areas.

The average length of interruptions for customers in the CBD was a six-year high (at 40 minutes) in 2015-16. This was 10 minutes higher than the 30-minute standard prescribed in the NQ&R Code. Western Power explained the high value was due to the combined effect of a storm in May 2016 and an underground cable failure in November 2015.

The average length of interruptions in urban areas was a six-year low, at 249 minutes, but this was still 89 minutes higher than the 160 minute standard prescribed in the NQ&R Code.

[9] A reconnection is the re-energisation of the customer premises following disconnection.

[10] Refer to pages 14 and 15 for more information about the two frameworks.

In the other areas of the state, Rottnest Island Authority was the only distributor that met the 290 minute standard for the average length of interruptions. In 2015-16, it reported an average of 136 minutes. Horizon Power and Western Power reported average interruption lengths of 359 minutes and 992 minutes, respectively.

SCONRRR framework

The SCONRRR framework has three key performance measures – SAIDI, SAIFI and CAIDI – that are described in the table below.

Performance Measure	Description
System Average Interruption Duration Index (SAIDI)	SAIDI is a measure of the average annual minutes of interruption per customer premise. This measure averages the total minutes of interruption across all premises connected to the network, including those premises that have not been interrupted
System Average Interruption Frequency Index (SAIFI)	Measures of the average number of times a customer premises is interrupted per annum
Customer Average Interruption Duration Index (CAIDI)	Measures the average annual minutes of interruption per customer premise, but only for those premises that were interrupted during the year

Further, the framework allows distributors to "normalise" their performance, by removing supply interruptions that are caused by factors beyond their reasonable control.[11]

The performance measures are applied to different classes of distribution feeder – CBD, urban, short rural and long rural.

Full descriptions of the three performance measures and the four feeder classes are on pages 14 and 15, and Appendix 4, respectively.

The normalised SAIDIs for all four feeder classes[12] on the Western Power distribution system were lower in 2015-16. The combined effect of the reductions was a 10.1 per cent reduction in total network average minutes of interruption (down from 169 minutes to 152 minutes).

The normalised total network SAIDI on the Horizon Power distribution systems was 31.8 per cent higher in 2015-16. Short rural and long rural SAIDIs increased by 32.7 per cent and 67.2 per cent respectively, while the urban SAIDI was 46.7 per cent lower.

Gas distribution system reliability

ATCO was the only gas distributor to report extended interruptions (interruptions longer than 12 hours continuously), or customer premises experiencing more than five interruptions in 2015-16.

There was a single customer premise affected by an extended interruption, and 532 premises affected by multiple interruptions (down from 743 in 2014-15). The multiple interruptions were caused by two mains break incidents and 12 water ingress events.

[11] Examples include generation outages, transmission outages, severe weather events and third party actions.

[12] The four feeder classes are CBD, Urban, Short Rural and Long Rural.

Gas leaks

The total number of gas main leak repairs increased by 37.3 per cent in 2015-16. ATCO reported a 35.8 per cent increase, and Kleenheat reported a 64.0 per cent increase. The increases were attributed to performing more gas main inspections during the year.

Streetlight repairs

In 2015-16, the total number of metropolitan and regional streetlights maintained by Horizon Power and Western Power increased by 2.9 per cent and 1.3 per cent respectively. By 30 June 2016, there were 228,066 metropolitan streetlights and 51,050 regional streetlights.

The number of faulty metropolitan streetlights was 1.0 per cent lower in 2015-16. The number of faulty lights on Western Power's distribution system has been trending downwards for some time, reaching a six-year low of 28,388 faults in 2015-16.

The total number of faulty regional streetlights has been trending upwards over the past six year. The number of faults increased by 7.9 per cent in 2015-16, to a six-year high of 4,323. The rise in total faults has tracked the number of faults on the Western Power distribution system.

In 2015-16, the proportion of faulty metropolitan streetlights repaired after five days[13] by Horizon Power and Western Power increased, to 16.2 per cent and 1.5 per cent, respectively. Horizon Power commented that the deterioration in performance was due to changes to how it allocates resources under its streetlight asset maintenance strategy to make it more efficient. For example, where it can, Horizon Power allocates to a crew the repair of multiple faulty streetlights in the same town rather than send a crew out to repair a single streetlight. This can result in delays to the completion of the work.

The percentage of faulty regional streetlights repaired after nine days by Horizon Power was at a six-year high of 21.9 per cent in 2015-16, due to the change in streetlight asset strategy discussed above.

Complaints

Electricity distributors

The number of complaints about technical quality of service issues received by electricity distributors decreased by 4.4 per cent in 2015-16. The majority (71.0 per cent) of the complaints cover issues that do not fall into any of the standard complaint categories. For the complaints that could be categorised, low supply voltage and TV or radio interference were the largest single categories.

In 2015-16, Horizon Power received 157.0 per cent more complaints about issues covered by the electricity code. Complaints about administrative and customer service issues increased by 201.2 per cent, and other complaints by 59.2 per cent.[14]

[13] Streetlight repair performance is assessed against a five-day repair time in metropolitan areas and a nine-day repair time in regional areas.

[14] Horizon Power's complaints data covers both retail and distribution related complaints.

Western Power received 3.1 per cent fewer electricity code complaints in 2015-16. Administrative and customer service complaints increased by 105.8 per cent, and other complaints were 15.5 per cent lower.

Western Power's complaints resolution performance improved in 2015-16. The proportion of complaints resolved within 15 business days was 86.4 per cent, a six-year high.

The proportion of complaints resolved within 15 business days by Horizon Power fell from 64.1 per cent in 2014-15 to 55.1 per cent in 2015-16. The decline in performance coincides with an increase in the number of complaints it received. The complaints were about incorrect manual meter readings in Broome during December 2015 and the replacement of existing meters with new Advanced Metering Infrastructure (AMI) meters.[15]

Gas distributors

ATCO received all except one of the complaints to gas distributors in 2015-16. The number of complaints received by ATCO increased by 117.4 per cent (to 513), following changes to its complaint recording system to align with the new Australian Gas Association's complaint definitions.

Complaints about administrative and customer service issues were the largest single category, accounting for 41.9 per cent of the total in 2015-16.

Call centre performance

The total volume of calls received by electricity distributor call centres was 8.2 per cent lower in 2015-16. Horizon Power received 11.7 per cent more calls (due to issues with its meter replacement project), while Rottnest Island Authority and Western Power received fewer calls, down by 62.8 per cent and 8.0 per cent, respectively.

Western Power attributed the reduction in calls to customers' increased use of self-service channels, such as their website.[16]

Both Horizon Power and Western Power reported a deterioration in all three performance measures,[17] while Rottnest Island Authority reported a deterioration in two of the three performance measures, in 2015-16. The reasons for the deterioration are discussed on page 38.

The total volume of calls received by gas distributor call centres was 3.2 per cent lower in 2015-16.

The performance of both gas distributors' call centres against all three performance measures in 2015-16 was broadly similar to that in 2014-15.

[15] Most of the complaints dealt with matters that relate to Horizon Power's retail operations, but its complaints system is not able to separate them from the distribution complaints.

[16] In 2015-16, customers visited the mobile outage webpage 508,000 times, and 23,800 customers were using the mobile phone app to obtain outage information. There has also been increased usage of social media platforms to respond to customer enquiries.

[17] The three measures are: percentage of calls answered within 30 seconds, the average time before a call is answered and the percentage of calls that are unanswered.

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About this Report

The ERA is the independent economic regulator in Western Australia that is responsible for administering the licensing schemes for energy distributors.[18]

The ERA reports on energy distributors' performance under its obligation to monitor and report to the Minister for Energy on the operation of the licensing schemes.[19] This is the sixth annual report on distributor performance.[20]

Performance reporting enhances transparency and accountability, and promotes greater integrity in the market. It also provides incentives for distributors to improve performance, and helps to identify emerging issues requiring a compliance response.

Performance reporting obligations only apply to small use customers as defined under the licensing legislation. These are residential and business customers whose annual consumption is less than 160MWh of electricity or one terajoule of gas.

The report is structured as follows:

- Energy distribution market overview: this section looks at the overall number of electricity and gas distributors, how many of those distributors supply small use customers, the number of connections on each distribution system and the timeliness of customer reconnections.[21]
- Reliability: this sections looks at supply interruptions on electricity and gas distribution systems. The electricity distribution system reliability is reported against the measures in the NQ&R Code[22] and the SCONRRR framework.[23]
- Gas consumption and unaccounted for gas: this section looks at the gas supplied to residential and business customers, and the difference in the amount of the gas entering gas distribution systems and the amount that is metered at supply points.
- Gas leaks: this section looks at the number gas main leaks, customer connection leaks and meter leaks on gas distribution systems.
- Street light repairs: this section looks at the number of street lights in metropolitan and regional areas, what proportion of those lights were repaired, and how many repairs were completed within the prescribed timeframe.
- Complaints: this section looks at how satisfied customers are with their distributor, measured by the number of complaints, and the effectiveness of retailers' complaint handling procedures. It also provides a breakdown of the technical quality of service complaints, and their cause(s).

[18] The licensing scheme for electricity distributors is in Part 2 of the *Electricity Industry Act 2004* (Electricity Act) and the licensing scheme for gas distributors is in Part 2A of the *Energy Coordination Act 1994* (Gas Act).

[19] Section 38 of the Electricity Act and section 11AA of the Gas Act.

[20] Prior to 2010-11, the ERA published separate reports on electricity distributors and gas distributors.

[21] Reconnection after supply has been disconnected at the request of the retailer for non-payment of a bill.

[22] *Electricity Industry (Network Quality and Reliability of Supply) Code 2005*.

[23] The framework is described in the *National Regulatory Reporting for Electricity Distribution and Retailing Businesses, Utility Regulators Forum*, March 2002. The document was published by the Steering Committee on National Regulatory Reporting Requirements (SCONRRR).

- Call centre performance: this section looks at how easy it is for customers to contact their distributor by telephone using three industry standard key responsiveness measures

Energy distribution market overview

This section looks at:

- the total number of electricity and gas distributors;[24]
- the number of distributors supplying small use electricity and gas customers;
- the number of small use electricity and gas customer connections; and
- the timeliness of electricity and gas reconnections.

Energy distributors

Table 1 shows the number of licensed electricity and gas distributors.

Table 1: Number of licensed electricity and gas distributors as at 30 June 2016

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Electricity						
Licensed Distributors	6	6	6	7[25]	7	7
Distributing to small use customers	3	3	3	3	3	3
Gas						
Licensed Distributors[26]	3	3	3	3	3	3

The number of licensed electricity and gas distributors has been quite static since the ERA assumed responsibility for the licensing of electricity and gas distribution in 2005.

The majority of the licensed electricity distributors that are currently active in the market were first granted a licence in 2006.[27] By the end of 2006, there were eight distribution licences in force. In 2010, two of the eight distributors surrendered their licence. The ERA also issued one new licence in 2013.[28]

The number of distributors licensed to supply small use customers has been unchanged since the licensing scheme commenced in 2006.

The ERA took over responsibility for licensing gas distributors from the Office of Energy[29] in 2005. At that time there were three licensed gas distributors, all of which are still licensed today.

[24] This includes electricity distributors that only supply large use customers (whose annual consumption is greater than 160MWh).

[25] In the 2013-14 report, this figure was erroneously reported to be six.

[26] The licensing scheme in Part 2A of the *Energy Coordination Act 1994* only covers distribution systems that supply small use customers.

[27] The *Electricity Industry Act 2004* commenced in 2005. Electricity distributors that were active when the Electricity Act commenced had to obtain a licence from the ERA by 30 June 2006.

[28] The new licence only authorised the distributor to supply large use customers.

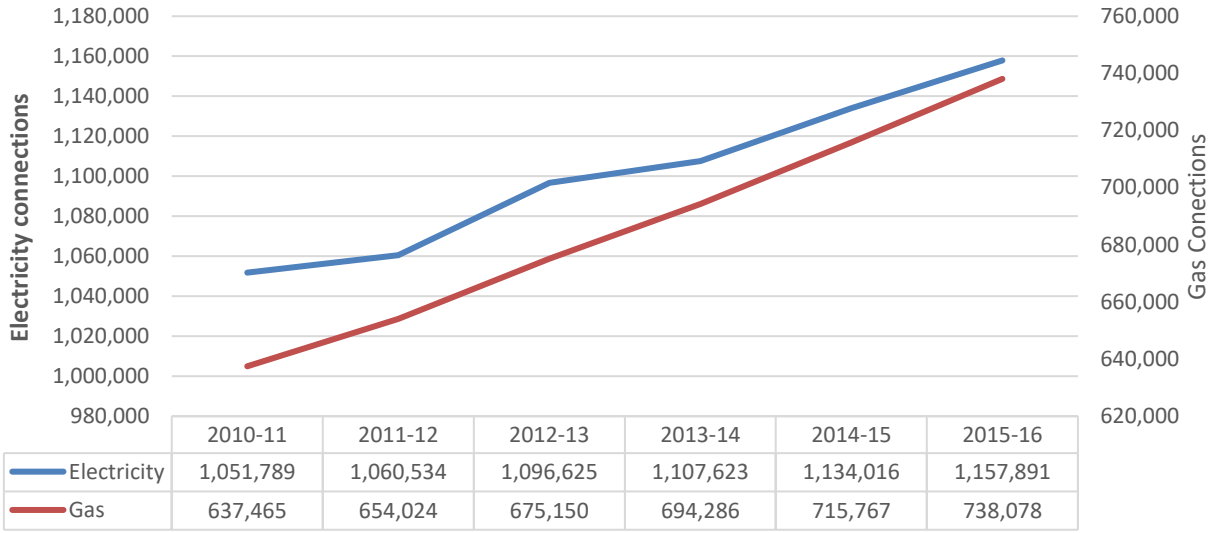
[29] The responsibilities of the Office of Energy are now undertaken by the Department of Finance's Public Utilities Office.

Customer connections

Throughout the rest of this report the term 'customer connection' means 'small use customer connection'.

Figure 1 shows the total number of connections on electricity and gas distribution systems. In 2015-16, the number of electricity connections increased by 2.1 per cent and the number of gas connections increased by 3.1 per cent. Since 2010-11, electricity connections have increased by 10.1 per cent, and gas connections have increased by 15.8 per cent.

Figure 1: Total number of small use electricity and gas customer connections



	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Electricity	1,051,789	1,060,534	1,096,625	1,107,623	1,134,016	1,157,891
Gas	637,465	654,024	675,150	694,286	715,767	738,078

Connections on electricity distribution systems

Table 2 shows the number of connections on each electricity distributor's system. In 2015-16, Western Power had 95.9 per cent of the total, and Horizon Power just under 4.1 per cent.

Table 2: Electricity connections by distributor

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	43,181	44,328	45,866	46,508	47,832	47,168
Rottnest Island Authority	83	527	527	527	527	527
Western Power	1,008,525	1,015,679	1,050,232	1,060,588	1,085,657	1,110,196
Total	**1,051,789**	**1,060,534**	**1,096,625**	**1,107,623**	**1,134,016**	**1,157,891**

Between 2014-15 and 2015-16, the number of connections on Western Power's distribution system increased by just under 2.3 per cent, and connections on Horizon Power's fell by 1.4 per cent. The number of connections on the Rottnest Island Authority's distribution system has remained unchanged since 2011-12.

Electricity distributors are subject to timeliness requirements when connecting a new premises. The *Electricity Industry (Obligation to Connect) Regulations 2005* prescribe the conditions for, and the time frames associated with, establishing a new connection to an electricity distribution system.

Table 3 compares the number of new connections on electricity distribution systems, and the proportion of those connections established on time (**late connections**) over the past two years.

The total number of new connections in 2015-16 was 5.8 per cent lower than in 2014-15. Both Western Power and Horizon Power reported a fall in the number of new connections, by 3.9 per cent and 45.4 per cent, respectively.

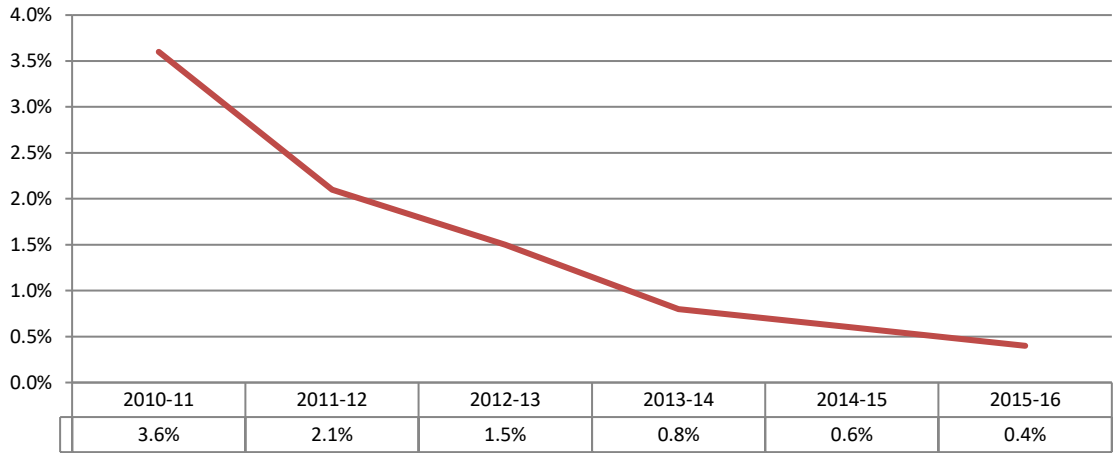
Both Horizon Power and Western Power reduced the proportion of late connections in 2015-16.

Table 3: New connections on electricity distribution systems

Distributor	2014-15			2015-16		
	Number of new connections	Connections not on time	% of connections not on time	Number of new connections	Connections not on time	% of connections not on time
Horizon Power	1,576	16	1.0	860	2	0.2
Rottnest Island Authority	0	-	-	0	-	-
Western Power	33,925	189	0.6	32,589	141	0.4
Total	**35,501**	**205**	**0.6**	**33,449**	**143**	**0.4**

Figure 2 shows that the proportion of late connections on the Western Power distribution system was at a six-year low in 2015-16.

Figure 2: Percentage of late connections on the Western Power distribution system



Connections on gas distribution systems

Table 4 shows the number of connections on each gas distributor's system. In 2015-16 ATCO had 99.82 per cent of the total.

Between 2014-15 and 2015-16, total connections on gas distribution systems increased by 3.1 per cent. The number of connections on all three distribution systems increased: ATCO by 3.1 per cent, Esperance Power Station by 5.3 per cent and Kleenheat by 3.7 per cent.

Table 4: Gas connections by distributor

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	636,323	652,808	673,878	692,988	714,488	736,746
Esperance Power Station	280	313	332	342	357	376
Kleenheat	862	903	940	956	922	956
State Total	**637,465**	**654,024**	**675,150**	**694,286**	**715,767**	**738,078**

Table 5 shows the number of gas connections that were provided after the date agreed with the customer. ATCO was the only distributor that provided late connections in 2015-16, which, at 1.2 per cent, were much higher than the 0.06 per cent in 2014-15.

ATCO explained that it transitioned to a new contractor in early 2016. The contractor experienced short-term resourcing issues, which resulted in an increase in the number of new connections that were not provided on or before the agreed date. This issue was identified by ATCO and resolved before 30 June 2016.

Table 5: New connections on gas distribution systems

Distributor	2014-15			2015-16		
	Number of new connections	Connections not on time	% of connections not on time	Number of new connections	Connections not on time	% of connections not on time
ATCO	23,734	14	0.06	24,600	287	1.2
Kleenheat	43	8	18.6	34	0	0.0
Esperance Power Station	12	0	-	18	0	0.0
Total	**23,789**	**22**	**0.1**	**24,642**	**287**	**1.2**

Reconnections on electricity and gas distribution systems

Since 2012-13, electricity and gas distributors have been required to report on their performance for reconnecting supply to a customer premises in accordance with the relevant prescribed time frames.

The relevant prescribed time frames for electricity distributors are in clause 8.2 of the *Code* of *Conduct for the Supply of Electricity to Small Use Customers* (**electricity code**), and the time frames for gas distributors are in clause 8.2 of the *Compendium of Gas Customer Licence Obligations* (**gas compendium**).

Table 6 shows the number of reconnections on electricity and gas distribution systems.

The number of reconnections on electricity systems in 2015-16 was 18.9 per cent lower than in 2014-15. Horizon Power and Western Power both reported reductions in reconnections, by 60.7 per cent and 9.2 per cent respectively.

ATCO performed almost all of the reconnections on gas distribution systems in 2015-16. Compared to 2014-15, the number of reconnections on the ATCO systems was 52.9 per cent higher.

Table 6: Reconnections on electricity and gas distribution systems

Reconnections on electricity systems					Reconnections on gas systems				
Distributor	2012-13	2013-14	2014-15	2015-16		2012-13	2013-14	2014-15	2015-16
Horizon Power	1,641	3,502	3,889	1,527	ATCO	3,692	2,820	7,112	10,875
Rottnest Island Authority	0	0	0	0	Esperance Power Station	2	25	30	5
Western Power	13,908	15,520	16,740	15,202	Kleenheat	4	2	10	8
Total	**14,003**	**19,022**	**20,629**	**16,729**	**Total**	**3,698**	**2847**	**7,152**	**10,888**

The number of reconnections on electricity systems in 2015-16 was 18.9 per cent lower than in 2014-15, with Horizon Power and Western Power both reporting reductions, by 60.7 per cent and 9.2 per cent respectively.

ATCO performed almost all of the reconnections on gas distribution systems in 2015-16. Compared to 2014-15, the number of reconnections on the ATCO systems was 15.2 per cent higher.

Table 7 shows the number and percentage of reconnections on electricity and gas distribution systems that were not provided on time (**late reconnections**).

In 2015-16, there were no late reconnections on gas distribution systems.

Western Power was the only electricity distributor to provide late reconnections in 2015-16. The proportion of late reconnections in 2015-16 was similar to 2014-15.

Table 7: Reconnections not provided on time

	2014-15			2015-16		
Distributor	Number of new connections	Connections not on time	% of connections not on time	Number of new connections	Connections not on time	% of connections not on time
Electricity						
Horizon Power	3,889	26	0.7	1,527	0	0.0
Rottnest Island Authority	0	N/A	N/A	0	N/A	N/A
Western Power	16,740	177	1.1	15,202	145	1.0
Gas						
ATCO	7,112	1	0.0	10,875	0	0.0
Esperance Power Station	30	0	0.0	5	0	0.0
Kleenheat	10	0	0.0	8	0	0.0

Electricity distribution system reliability

Electricity distributors are required to report on reliability under two regulatory frameworks:

- the *Electricity Industry (Network Quality and Reliability of Supply) Code 2005* (**NQ&R code**); and
- the *2002 Steering Committee on National Regulatory Reporting Requirements* (**SCONRRR framework**).[30]

NQ&R code specific reliability measures

The NQ&R code requires distributors to report on the length and frequency of supply interruptions:

- the number of customer premises that have experienced interruptions that exceed 12 hours continuously (**extended interruption**); and
- The number of customer premises that have experienced more than:
  - Nine interruptions per annum in the Perth CBD[31] and urban areas; or
  - 16 interruptions per annum in all other areas of the State.

Shared NQ&R Code and SCONRRR framework reliability measures

The SCONRRR framework and the NQ&R code both measure distribution system reliability through three key performance indicators:[32] [33]

- System Average Interruption Duration Index (**SAIDI**) – measures the total duration of supply interruptions for the average customer on the network.
- System Average Interruption Frequency Index (**SAIFI**) – measures how often the average customer experiences a supply interruption.
- Customer Average Interruption Duration Index (**CAIDI**) – measures the total duration of supply interruption for only those customers who have experienced an interruption during the reporting period.

The standard calculation of SAIDI, SAIFI and CAIDI only includes sustained supply interruptions, which are more than one minute in duration. Unusually, the NQ&R code requires distributors to include both planned and unplanned interruptions, regardless of

[30] The framework is described in the *National Regulatory Reporting for Electricity Distribution and Retailing Businesses, Utility Regulators Forum*, March 2002. The document was published by the Steering Committee on National Regulatory Reporting Requirements (SCONRRR).

[31] Central Business District, which is the area supplied by the Milligan Street Zone Substation and the Hay Street Zone Substation, both operated by Western Power.

[32] The definition of the three measures is in Standard *IEEE 1366-2003 - Guide for Electric Power Distribution Reliability Indices, Institute for Electrical and Electronic Engineers*.

[33] The NQ&R code does not use the terms SAIDI, SAIFI and CAIDI, see Appendix 4 for more information.

what caused an interruption, and its duration. This differs from other reliability measurement frameworks that are in common use, such as the SCONRRR framework.[34]

The SCONRRR framework requires distributors to report on the type of interruption and the type of feeder that interruption occurred on:

- The type of the interruption has four classifications – Overall, Planned Interruptions, Unplanned Interruptions and Normalised Unplanned Interruptions.[35]
- There are four types of feeder – CBD, Urban, Short Rural and Long Rural.[36]

System Reliability Standards

Section 13(2) of the NQ&R code includes standards for the average total length of interruptions[37] in the three defined areas of the State:[38]

- Perth CBD – 30 minutes;
- the urban areas other than the Perth CBD (**urban areas**) – 160 minutes;[39] and
- any other area of the State (**rural areas**) – 290 minutes.

The standard for each area takes into account the level of interconnection, and available reserved capacity that have been factored into the design of the distribution systems.

The SCONRRR framework does not include any reliability standards. It is left to the relevant state/territory regulator to set the standards for the distributors they regulate.

In Western Australia, Western Power is the only distributor that is subject to reliability performance standards, under its access arrangement service standard benchmarks.[40] The other distributors covered by this report are not subject to distribution system reliability standards. However, publishing the reliability data for these distributors provides useful information about the performance of their distribution systems over time, and provides an opportunity to benchmark performance against other distributors.[41]

[34] Most reliability reporting frameworks in common use require distributors to report on unplanned interruptions that are caused by factors considered to be within their control. This means that unplanned interruptions caused by severe weather events, third party actions, generation outages and transmission network outages are excluded.

[35] Appendix 4 has more information about the definitions of interruption categories.

[36] The definition of each feeder type is in Table 63, Appendix 4.

[37] This is the equivalent to the SAIDI for the group of feeders supplying customers in each geographical area.

[38] See Appendix 4 for more information about how the standard is calculated.

[39] These areas are defined in section 3 of the code, and include: the Perth metropolitan region, Albany, Bunbury, Geraldton, Kalgoorlie and Mandurah.

[40] The access arrangement requires Western Power to meet the service levels defined in the service standard benchmarks, which include benchmarks for distribution system reliability. More information is available on the ERA website: https://www.erawa.com.au/electricity/electricity-access/western-power-network.

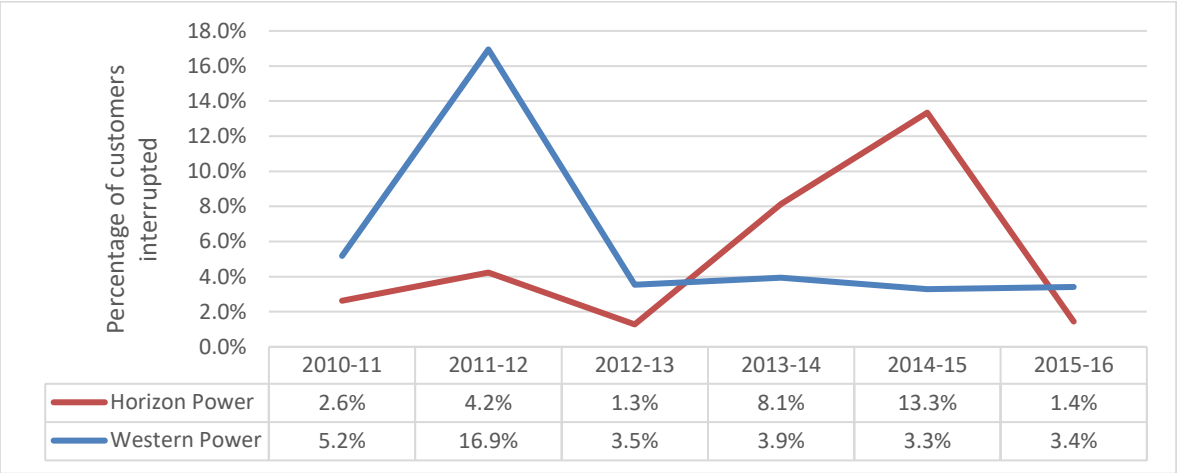
[41] The reliability of distributors in the National Electricity Market is calculated using a framework that is very similar to the SCONRRR framework. See Appendix 4 for more information.

Distribution network reliability – NQ&R code

Extended interruptions

Figure 3 shows the percentage of customer premises on the Horizon Power and Western Power distribution systems that have experienced an extended interruption.[42]

Figure 3: Horizon Power and Western Power extended interruptions



	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	2.6%	4.2%	1.3%	8.1%	13.3%	1.4%
Western Power	5.2%	16.9%	3.5%	3.9%	3.3%	3.4%

The number of customers affected by extended interruptions varies each year, because of unpredictable environmental factors, such as severe storms or bush fires.

Over the past six years, the proportion of customer premises on Western Power's systems that have experienced an extended interruption has been between 3.3 per cent and 16.9 per cent.[43] Excluding 2011-12, the average percentage of affected customer premises per annum is 3.8 per cent.

The number of extended interruptions on the Horizon Power systems was much lower in 2015-16. The peak in 2014-15 was caused by tropical cyclones Olwyn and Quang.

Rottnest Island Authority reported that there were no extended interruptions to customer premises during 2015-16.

Multiple interruptions

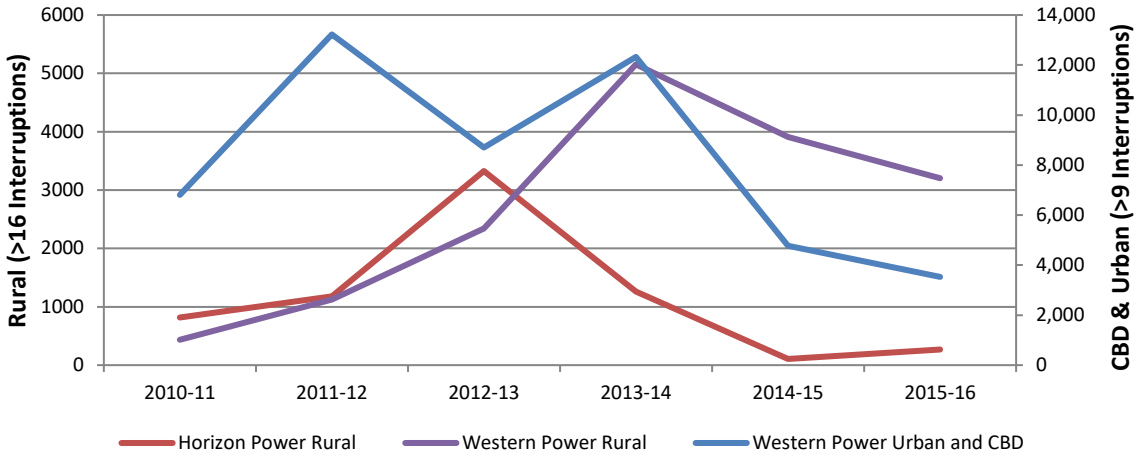
Figure 4 shows the number of customer premises that experienced more than the prescribed number of interruptions (**excess interruptions**) in the Perth CBD and urban areas, both exclusively supplied by Western Power, and in rural areas, where all three distributors have distribution systems.[44]

[42] Rottnest Island Authority is excluded from Figure 3 because the number of extended interruptions on their system over the past six years is small compared to Horizon Power and Western Power. The data for Rottnest Island Authority can be found in Appendix 3, Table 37.

[43] The peak in 2012 was caused by major storms that interrupted supply to a large number of customers across the south west and south of the State.

[44] Rottnest Island Authority has been excluded from Figure 4 because they have not reported any multiple interruptions to customer premises over the past six years.

Figure 4: Multiple supply interruptions on electricity distribution systems



The number of customer premises experiencing excess interruptions each year is quite variable, because of the same factors that influence the number of extended interruptions.

In 2015-16, there were fewer premises experiencing excess interruptions in all areas except Horizon Power's areas, where premises affected by excess interruptions increased by 152.8 per cent (from 106 to 268 premises) compared to 2014-15.

Customer premises affected by excess interruptions in the combined Perth CBD and urban areas were 26.1 per cent lower, and those in Western Power's rural areas were 18.1 per cent lower.

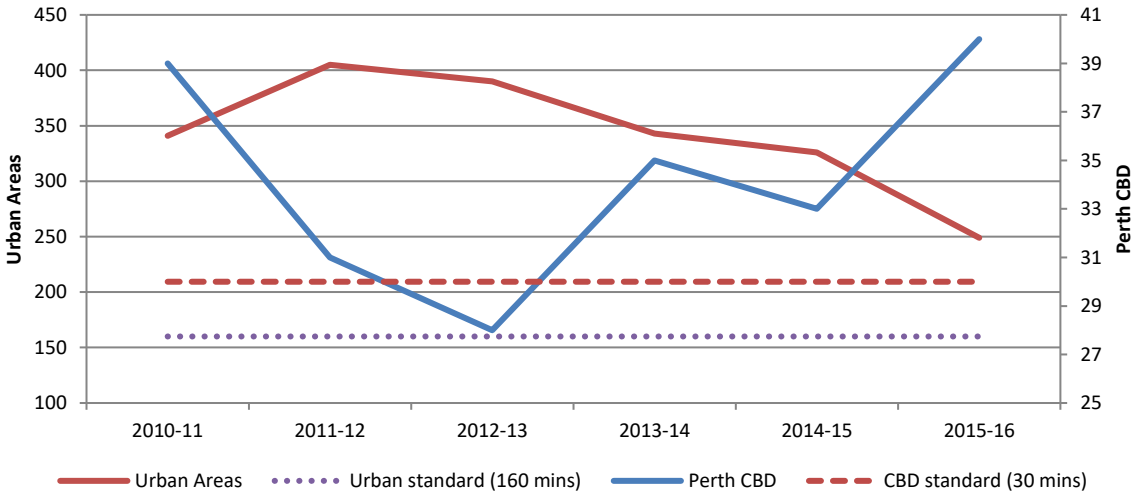
System Reliability

System Reliability in the Perth CBD and urban areas

Western Power is the only distributor that supplies customers in the Perth CBD and urban areas.

Figure 5 shows the average total length of interruptions per connection (SAIDI) in these areas, and compares them with the applicable standards in section 13 the NQ&R Code.

Figure 5: Average total length of interruptions on Perth CBD and urban areas



The total length of interruptions in both the Perth CBD and urban systems exceeded their respective NQ&R standard[45] – in the Perth CBD by 10 minutes (or 33 per cent), and in the urban areas by 89 minutes (or 55.6 per cent).

The average total length of interruptions in the Perth CBD increased. In 2015-16, the total length of interruptions was 40 minutes, up from 33 minutes in 2014-15. Western Power explained the increase was predominantly caused by:

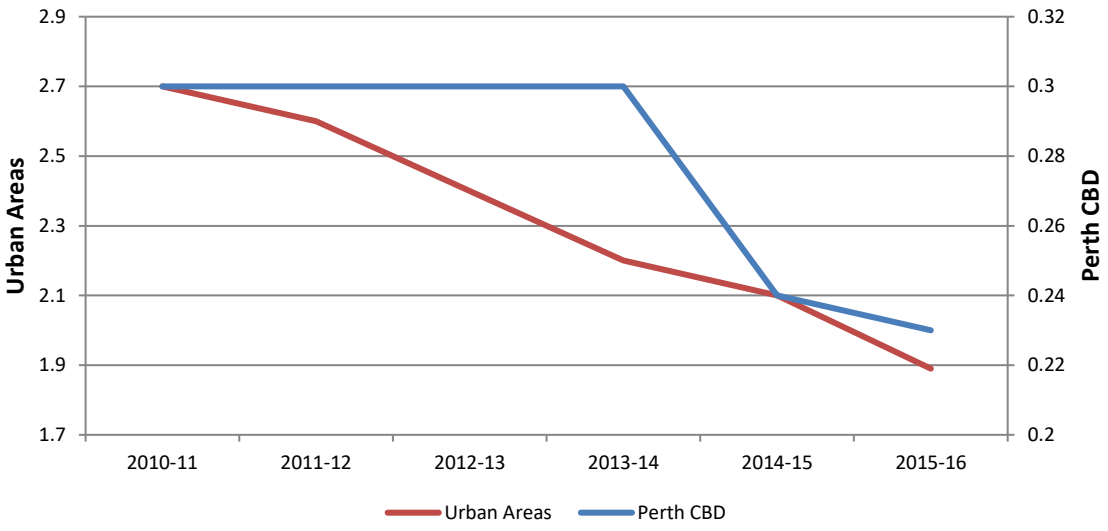
- a storm on 21 May 2016, which caused a supply interruption that lasted more than 43 hours;[46] and
- an underground cable failure on 5 November 2015, which caused an interruption that lasted more than 24 hours.

The average total length of interruptions in urban areas continued its downward trend. In 2015-16, the length of interruptions was a six-year low of 249 minutes.

Figure 6 shows the average frequency of supply interruptions experienced by customers in the Perth CBD and urban areas.

In 2015-16, the frequency of supply interruptions were both at six-year lows, at 0.2 interruptions per connection in the Perth CBD, and 1.9 interruptions per connection in urban areas.

Figure 6: Average frequency of interruptions on Perth CBD and urban areas



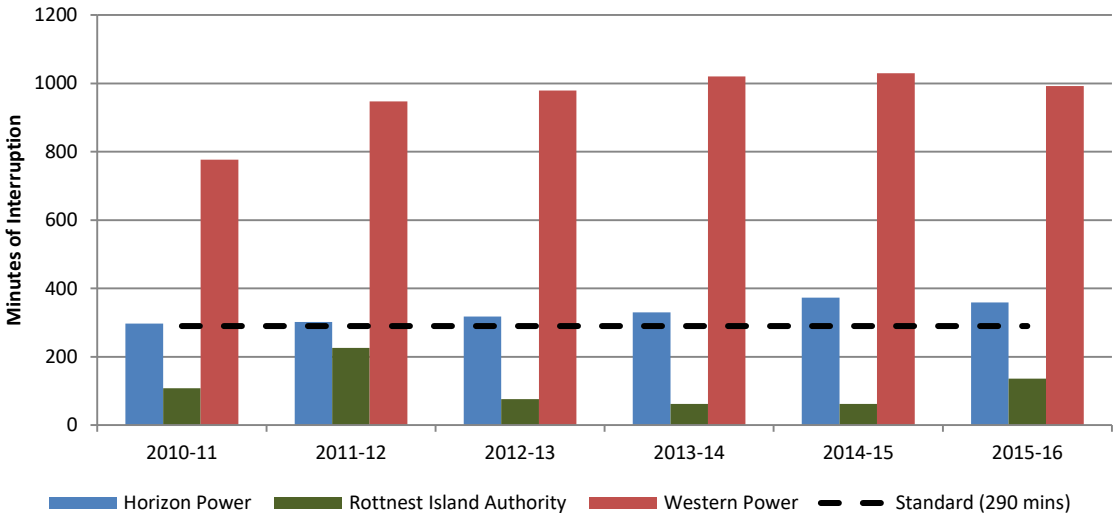
System Reliability in Other Areas of the State

Figure 7 shows the average total length of interruptions per connection (SAIDI) on distribution systems located in rural areas for each distributor.

[45] The standards are 30 minutes for the Perth CBD and 160 minutes for urban areas.

[46] The supply interruption affected 10 CBD customers who experienced an outage lasting more than 43 hours. As the storm occurred on a weekend and affected approximately 114,000 customers across the distribution system, priority was given to restoring supply to non-CBD customers.

Figure 7: Average total length of interruptions on electricity distribution systems in rural areas



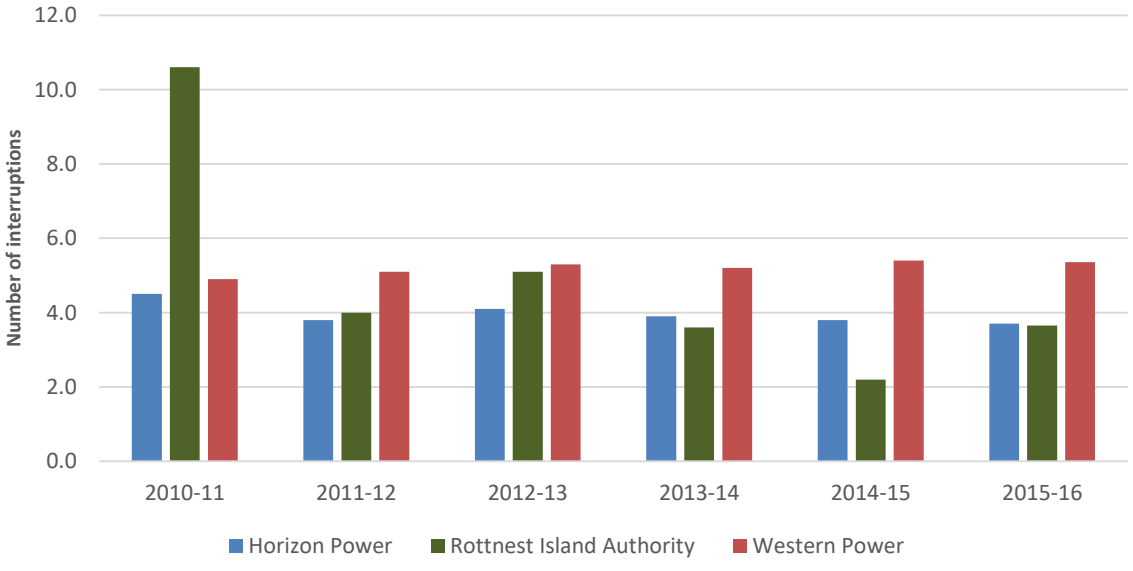
Over the past six years, Rottnest Island Authority is the only distributor that has met the standard prescribed in the NQ&R Code. In 2015-16, the average length of interruptions on its system was 136 minutes, up from 62 minutes in 2014-15.

The average length of interruptions on both Horizon Power's systems and Western Power's systems were slightly lower. In 2015-16, Horizon Power's interruptions were 3.8 per cent lower (at 359 minutes), and Western Powers interruptions were 3.7 per cent lower (at 992 minutes.

Figure 8 shows the average frequency of interruptions per connection on distribution systems located in rural areas for each distributor.

It can be seen that the performance of the Horizon Power and Western Power systems in 2015-16 were very similar to 2014-15. The average number of interruptions on Rottnest Island Authority's system were 68.2 per cent higher (at 3.7 per connection) in 2015-16. Rottnest Island Authority explained the increased interruptions were due to a major high voltage cable failure in early 2016.

Figure 8: Average frequency of interruptions in other areas of the State



Distribution system reliability – SCONRRR framework

System Average Interruption Duration Index (SAIDI)

Table 8 shows the overall and normalised SAIDI values by feeder class for each distributor in 2015-16. The Total Network SAIDI is a weighted average value, with the weighting based on the proportion of the total customers served by each of the distribution system feeder types.

Table 8: Overall and normalised SAIDI by electricity distributor

Distributor	Overall Average Interruption Duration (minutes per annum)				
	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	284	N/A	37	247	1728
Rottnest Island Authority	343	N/A	N/A	343	N/A
Western Power	353	51	183	505	1216
	Normalised Average Interruption Duration (minutes per annum)				
	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	199	N/A	32	199	764
Rottnest Island Authority	0	N/A	N/A	0	N/A
Western Power	152	23	91	168	583

N/A – The distributor does not operate feeders of this type

As expected, the normalisation process (which excludes some system interruptions from the calculation of SAIDI) results in the values of normalised SAIDI being lower than the overall SAIDI. In the case of the Rottnest Island Authority distribution system, the normalisation process has excluded all of the interruptions.[47]

The value of SAIDI for each class of feeder is consistent with the level of redundancy in the network for that class, and the remoteness of the location. For example, long rural feeders tend not to have any redundancy, and are often in remote locations, which increases the time to repair faults.

Table 9 compares each distributor's normalised SAIDI by feeder class in 2014-15 and 2015-16.

Table 9: Comparison of normalised SAIDI for each electricity distributor

	2014-15					2015-16				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	151	N/A	60	150	457	199	N/A	32	199	764
Rottnest Island Authority	0	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A
Western Power	169	26	103	183	677	152	23	91	168	583

N/A – No feeders of this type are operated by the distributor

[47] This result is consistent with previous years, where the majority of interruptions were caused by generator outages.

Normalised SAIDI improved for all four classes of feeder on the Western Power distribution systems in 2015-16. This resulted in the Total Network SAIDI falling by 10.1 per cent, compared to 2014-15.

The normalised SAIDI for Horizon Power's short rural and long rural feeders increased in 2015-16, up by 32.7 per cent and 67.2 per cent, respectively. This resulted in a 31.8 per cent increase in Total Network SAIDI. Horizon Power attributed the increase in SAIDI to the Esperance bushfires in November 2015.

System Average Interruption Frequency Index (SAIFI)

Table 10 shows the overall and normalised SAIFI values by feeder class for each distributor in 2015-16. The Total Network SAIFI is a weighted average value, with the weighting based on the total customers served by each of the distribution system feeder types.

The SAIFI associated with the interruptions that are excluded from the calculation of normalised SAIDI in Table 9 are also excluded from the calculation of normalised SAIFI in Table 10.

Table 10: Overall and normalised SAIFI for each electricity distributor

	Overall Distribution network - Average Interruption Frequency (per annum)				
Distributor	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	3.6	N/A	0.9	3.6	10.9
Rottnest Island Authority	3.7	N/A	N/A	3.7	N/A
Western Power	2.1	0.2	1.3	2.7	6.6
	Normalised Distribution network - Average Interruption Frequency (per annum)				
	Total Network	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	3.1	N/A	0.9	3.2	7.8
Rottnest Island Authority	0.0	N/A	N/A	0.0	N/A
Western Power	1.4	0.1	0.9	1.9	4.0

N/A – No feeders of this type are operated by the distributor

Table 11 shows each distributor's normalised SAIFI by feeder class in 2014-15 and 2015-16.

Table 11: Comparison of normalised SAIFI for each electricity distributor

	2014-15					2015-16				
Distributor	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	2.7	N/A	1.1	2.8	6.4	3.1	N/A	0.9	3.2	7.8
Rottnest Island Authority	0.0	N/A	N/A	0.0	N/A	0.0	N/A	N/A	0.0	N/A
Western Power	1.6	0.2	1.1	2.0	4.4	1.4	0.1	0.9	1.8	4.0

N/A – No feeders of this type are operated by the distributor

Comparing Table 11 with Table 9 shows that the change in the values of SAIFI between 2014-15 and 2015-16 mostly follows the same pattern as that for the SAIDI values. This result is to be expected, because when an interruption is removed from the total interruptions by the normalisation process its effect on the SAIDI and SAIFI is removed from both the total SAIDI and the total SAIFI.

Customer Average Interruption Duration Index (CAIDI)

Table 12 shows the overall and normalised CAIDI values by feeder class for each distributor.

The CAIDI values for each class of feeder measure the average length of interruptions for those customers who actually experienced an interruption during the year. Therefore, the CAIDI values are more representative of the actual experience of the customers who were interrupted than the SAIDI values.

Table 12: Overall and normalised CAIDI for each electricity distributor

	Overall Distribution Network - Average Interruption Duration (minutes per annum)				
Distributor	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	80	N/A	41	69	158
Rottnest Island Authority	93	N/A	N/A	93	N/A
Western Power	166	272	138	185	185
	Normalised Distribution Network - Average Interruption Duration (minutes per annum)				
	Total Network	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	65	N/A	36	62	98
Rottnest Island Authority	0	N/A	N/A	0	N/A
Western Power	111	217	101	96	146

N/A – No feeders of this type are operated by the distributor

Table 13 shows each distributor's normalised CAIDI by feeder class in 2014-15 and 2015-16.

Table 13: Comparison of normalised CAIDI for each electricity distributor

	2014-15					2015-16				
Distributor	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**	**Total Network**	**CBD**	**Urban**	**Short Rural**	**Long Rural**
Horizon Power	55	N/A	53	54	71	65	N/A	36	62	98
Rottnest Island Authority	0.0	N/A	N/A	0.0	N/A	0	N/A	N/A	0	N/A
Western Power	108	158	94	92	154	111	217	101	96	146

N/A – No feeders of this type are operated by the distributor

Comparing 2014-15 with 2015-16 shows that the Total Network CAIDI on the Horizon Power systems increased by 18.2 per cent and on the Western Power systems by 2.8 percent.

Horizon Power reported increases in CAIDI for all feeder classes except urban. The increases in CAIDI are consistent with the increases in SAIDI.

Customers on the Western Power CBD system experienced the largest increase in average interruption duration, up by 37.3 per cent between 2014-15 and 2015-16. Some of the reasons for the increase are discussed on page 18.

Gas distribution system reliability

The measurement of interruptions on gas distribution networks is not quite as straightforward as it is for electricity distribution networks.

While it is certain that the premises downstream of a supply interruption on electricity distribution systems have lost supply, gas leaks or mains breaks on gas distribution systems do not always cause a loss of supply to all of the premises connected downstream.

Gas distribution systems are pressurised, so there may be sufficient pressure to maintain an adequate supply of gas for some time after the gas has started to escape from the system. This makes it difficult to accurately estimate the duration of a supply interruption to customer premises or, in some cases, whether the supply has been interrupted at all.

Gas distributors are required to report on the length and frequency of supply interruptions:

- the number of customer premises that have experienced interruptions that exceed 12 hours continuously (**extended interruptions**); and
- the number of customer premises that have experienced five or more interruptions.

Multiple interruptions on gas distribution systems

Over the past six years, ATCO is the only distributor to report customer premises that experienced five or more interruptions per annum. In 2015-16, there were 532 customer premises affected, down from 743 customers in 2014-15. ATCO explained that the interruptions were caused by two mains break incidents, both caused by third parties, and 12 water ingress events.

Extended interruptions

In 2015-16, ATCO was the only distributor to report any customer premise that experienced extended supply interruptions, and then only a single premises was affected. This is only the third time that a gas distributor has reported extended interruptions of supply to a customer since reporting commenced seven years ago.[48]

[48] Refer to Table 39 in Appendix 3.

Gas consumption and unaccounted for gas

Gas consumption

Gas distributors are required to record the amount of gas consumed by residential and business customers on their distribution systems.

Table 14 compares residential and business gas consumption in 2014-15 and 2015-16.

Total residential and business gas consumption increased in 2015-16, because of increased consumption on the ATCO systems. Kleenheat reported small falls in both residential and business gas consumption, while consumption on the Esperance Power Station system was almost unchanged.

Table 14: Comparison of gas consumption by distributor (GJ)

	Residential			Non-Residential		
Distributor	**2014-15**	**2015-16**	**Change (%)**	**2014-15**	**2015-16**	**Change (%)**
ATCO[49]	9,816,762	10,049,915	2.4	1,286,095	1,319,166	2.6
Esperance Power Station	3,981	4,014	0.8	32,669	32,342	-1.0
Kleenheat	7,489	7,348	-1.9	225	218	-3.1
State Total	**9,828,232**	**10,061,277**	**2.4**	**1,318,989**	**1,351,726**	**2.5**

Residential and business gas consumption over the past six years is in Table 57 of Appendix 3.

Unaccounted for gas

Unaccounted for gas (**UFG**) is a measure of network efficiency for gas distribution systems. UFG represents the difference between gas metered at the input to the distribution system and the aggregated quantity of gas metered at customer connections.

The two most common contributors to UFG are leaks and metering differences at the start and end point of the system.

Table 15 shows the quantity of UFG for each distributor.

Table 15: Unaccounted for gas (GJ)

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO[50]	866,667	920,371	813,898	707,191	705,987	715,966
Esperance Power Station	0	0	0	0	0	0
Kleenheat	931	1,158	866	943	529	562
State Total	**867,598**	**921,529**	**814,764**	**708,134**	**706,516**	**716,528**

[49] ATCO's gas consumption data is based on calendar year from January to December. The consumption data for the 2015-16 period is in fact that for the 2015 calendar year.

[50] ATCO's UFG data is based on calendar year from January to December. The UFG for the 2015-16 period is in fact that for the 2015 calendar year.

Esperance Power Station has reported zero UFG on its distribution system.[51] The level of UFG on the ATCO and Kleenheat distribution systems in 2015-6 were both slightly higher than in 2014-15.

Comparing Table 15 with Table 14 shows that in 2015-16 UFG accounted for 6.9 per cent of the gas entering Kleenheat's distribution systems.

It is not possible to calculate the percentage of gas supplied into the ATCO distribution systems that becomes UFG, because ATCO's reported gas consumption is for small use customer connections, whereas UFG is a total figure for the systems, including large use customer connections.

[51] This is the seventh consecutive year that Esperance Power Station has reported zero UFG. The explanation provided is that the distribution network is relatively new, and is entirely constructed from modern plastic piping.

Gas Leaks

Table 16 shows the number of repairs to low, medium and high pressure gas mains by each distributor.

Table 16: Gas mains leak repairs

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	600	830	835	842	575	781
Esperance Power Station	0	0	2	0	0	2
Kleenheat	1	0	1	1	25	41
State Total	**601**	**830**	**838**	**843**	**600**	**824**

ATCO accounts for most of the gas mains repairs, which reflects the size of its distribution systems in comparison to the other two distributors.[52]

Compared to 2014-15, ATCO reported a 35.8 per cent increase, and Kleenheat reported a 64.0 per cent increase in the number of gas main leak repairs on their distribution systems.

The increase in leak repairs on ATCO's gas mains is the result of an increase in the number leaks found during its routine leak survey program.

Kleenheat attributed the increase in its gas mains leak repairs to an increase in inspections and the use of a more sensitive leak detection method.

Table 17 shows the number of property service connection leak repairs.

Table 17: Gas property service connection leak repairs

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	6,003	5,657	6,614	7,182	5,575	6,040
Esperance Power Station	1	0	3	0	1	0
Kleenheat	0	0	0	0	42	5
Total	**6,004**	**5,657**	**6,617**	**7,182**	**5,618**	**6,045**

Compared to 2014-15, ATCO reported an 8.3 per cent increase, and Kleenheat reported an 82.2 per cent reduction in the number of property connection leak repairs.

Kleenheat commented that the majority of its property connection leak surveys were completed in 2014-15, which accounts for the large reduction in the number leak repairs in 2015-16.

Table 18 shows the number of leak repairs to gas meters.

Kleenheat reported a large increase in meter leak repairs in 2015-16. This was due to an increase in the number of meter inspections performed during the year.

Gas meter leak repairs on the ATCO systems were 9.0 per cent lower in 2015-16. There was a large increase in the number of meter leak repairs in 2014-15, due to improvements to ATCO's ability to identify meter leak repairs.

[52] See Appendix 2 for more information on the size of each distributor's systems.

Table 18: Gas meter leak repairs

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	1,008	816	486	471	3,527	3,209
Esperance Power Station	0	0	0	0	0	2
Kleenheat	0	1	0	2	0	44
Total	**1,008**	**817**	**486**	**473**	**3,527**	**3,255**

Streetlight repairs

Table 19 shows the number of street lights in metropolitan and regional areas that are maintained by each distributor.

The total number of streetlights in metropolitan areas increased by 2.9 per cent in 2015-16. The number of streetlights maintained by Horizon Power and Western Power increased by 2.9 per cent and 3.9 per cent, respectively.

The total number of streetlights in regional areas increased by 1.3 per cent in 2015-16. Horizon Power and Western Power reported increases in the number of streetlights, by 0.8 per cent and 1.4 per cent, respectively.

Table 19: Number of street lights in metropolitan and regional areas

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Metropolitan areas						
Horizon Power	5,293	5,441	5,993	8,325	8,022	8,332
Western Power	192,890	198,070	199,767	207,146	213,526	219,734
Total	**198,183**	**203,511**	**205,760**	**215,471**	**221,548**	**228,066**
Regional areas						
Horizon Power	9,610	9,978	10,331	11,298	11,007	11,092
Rottnest Island Authority	190	190	190	190	189	189
Western Power	37,018	37,595	37,907	38,539	39,202	39,769
Total	**46,818**	**47,763**	**48,428**	**50,027**	**50,398**	**51,050**

Table 20 shows the number of faulty street lights reported to each distributor.

The total number of metropolitan streetlight faults, and the faults logged by each distributor, were at a six-year low in 2015-16. The total number of faults logged has been on a downward trend since 2012-13, mirroring the faults logged by Western Power.

The total number of regional streetlight faults increased by 7.9 per cent in 2015-16, reaching a six-year high. Rottnest Island Authority was the only distributor to log a decrease in faults.

Table 20: Number of street light faults logged in metropolitan and regional areas

Metropolitan	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Metropolitan areas						
Horizon Power	168	180	108	149	158	130
Western Power	35,912	34,271	36,525	33,447	28,647	28,388
Total	**36,080**	**34,451**	**36,633**	**33,596**	**28,805**	**28,518**
Regional areas						
Horizon Power	156	168	166	168	177	183
Rottnest Island Authority	36	18	46	18	112	79
Western Power	2,922	3,137	3,414	3,220	3,717	4,061
Total	**3,114**	**3,323**	**3,626**	**3,406**	**4,006**	**4,323**

Figure 9 shows the number of streetlight faults logged by distributors, expressed as a percentage of the total street light population maintained by each distributor.

The percentage of metropolitan streetlight faults logged by Western Power has continued the downward trend that commenced in 2012-13. In 2015-16, it was 12.9 per cent, a six-year low.

The proportion of streetlight faults logged by Rottnest Island Authority was lower in 2015-16. The much larger proportion of faults logged over the past two years is the result of improved monitoring and reporting.

Figure 9: Percentage of faulty street lights by distributor and location

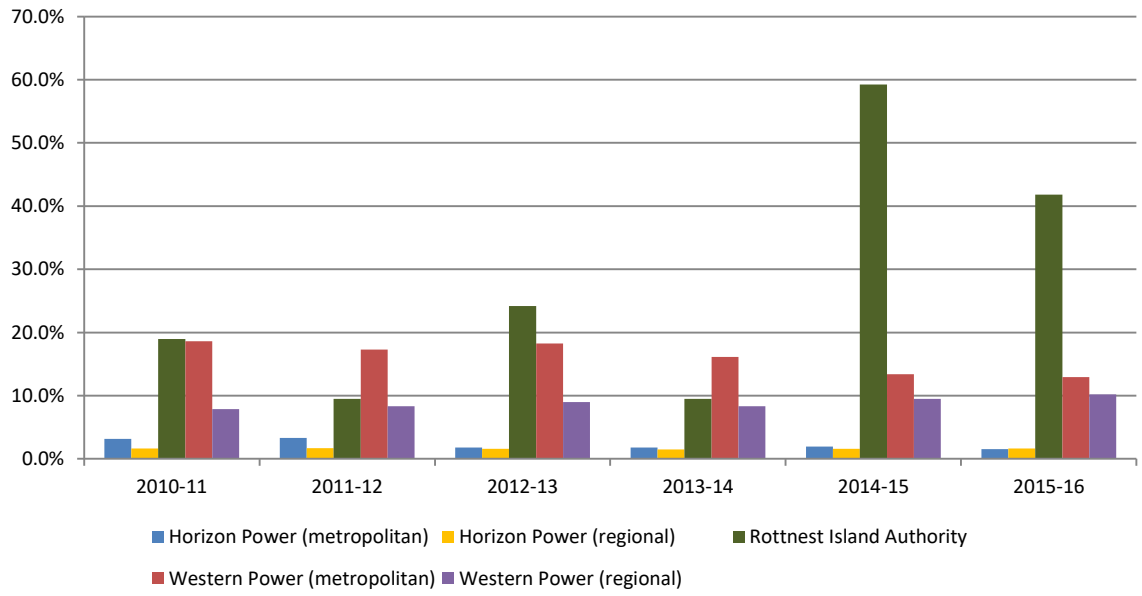
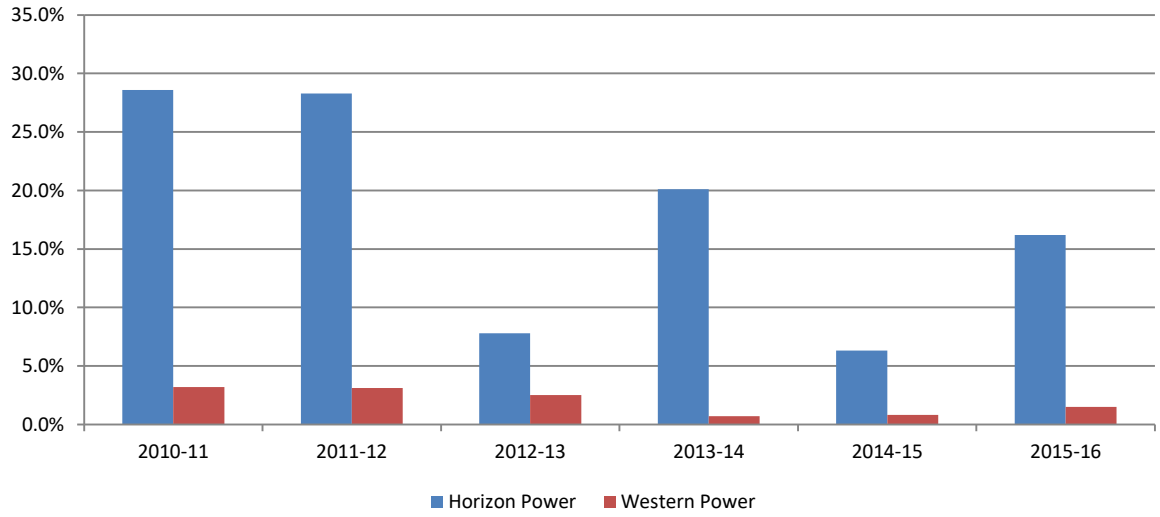


Figure 10 shows the proportion of faulty metropolitan street lights that were repaired more than five business days after they were reported faulty.

Figure **10**: Percentage of faulty metropolitan street lights repaired after 5 business days



In 2015-16, the proportion of faulty metropolitan streetlights repaired after five days by Horizon Power and Western Power both increased, to 16.2 per cent and 1.5 per cent respectively.

Horizon Power commented:

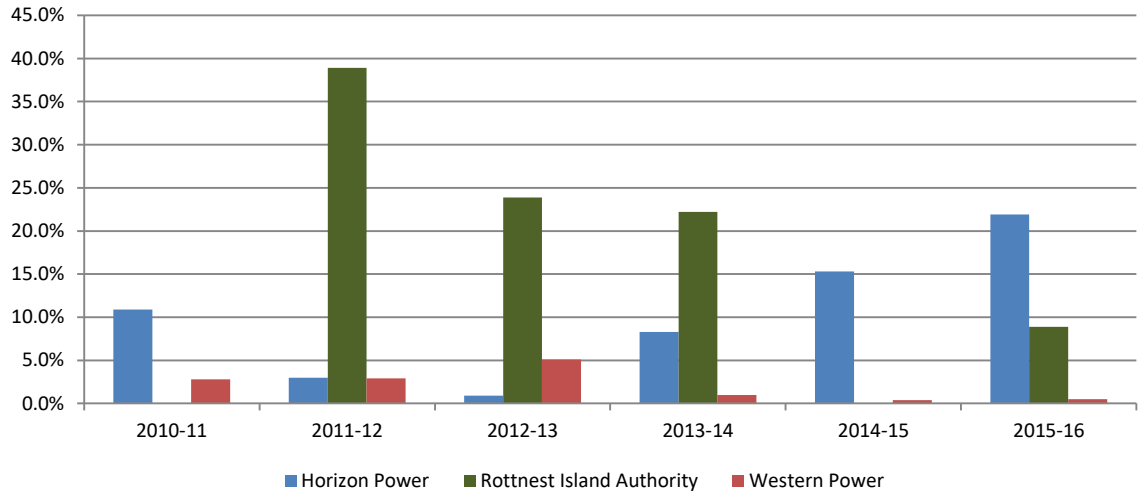
> […] has modified its streetlight asset maintenance strategy to reduce the cost base of this program.

Figure 11 shows the percentage of faulty regional street lights that were repaired more than nine business days after they were reported faulty.

The percentage of faulty regional streetlights repaired after nine days by Horizon Power was at a six-year high of 21.9 per cent. The change in streetlight asset strategy discussed above also explains the increase in regional streetlight repairs.

The percentage of faulty regional streetlights repaired after nine days by Western Power was almost unchanged. In 2015-16, Western Power repaired 0.5 per cent of streetlights after nine days.

Figure 11: Percentage of faulty regional street lights repaired after 9 days



Complaints

Both the electricity code and the gas compendium require distributors to have an internal process for handling complaints and resolving disputes that complies with Australian Standard AS ISO 10002 – 2014 (*Guidelines for complaint management in organisations*).

AS ISO 10002 – 2014 defines a complaint as:

> An expression of dissatisfaction made to an organisation, related to its products, or the complaints-handling process itself, where a response or resolution is explicitly or implicitly expected.[53]

Distributors are also required to comply with the ERA's *Customer Complaints Guidelines,* which has information to help distinguish between queries, complaints and other customer communications.

A key measure of the effectiveness of a distributor's complaints handling process is how quickly a complaint is concluded.[54] Distributors report on the percentage of complaints that are concluded within 15 business days.

Electricity complaints

The electricity code and the SCONRRR framework both include complaint recording and reporting obligations.

The electricity code separates complaints into two categories:

- Administrative process or customer service complaints – includes meter reading, timeliness of correspondence and other customer communications, the complaints handling process, timeliness of response to a complaint and any other process of a general administrative nature.
- Other complaints – includes poor service, privacy issues and health and safety issues.

The SCONRRR framework focuses on technical quality of supply (**QoS**) complaints, which are separated into eight categories:

- Supply voltage (four categories) – low voltage, voltage swells, voltage dips and voltage spikes.
- Waveform distortion.
- TV or radio interference.
- Noise from appliances.
- Other.

[53] The electricity code and the gas compendium have slightly modified this definition by adding the words "or services" immediately after "products" because energy distributors provide a service rather than a product to their customers.

[54] A complaint is concluded when all of the relevant parts of the distributor's complaints handling process have been exercised in an attempt to resolve the complaint.

Distributors are also required to report on the likely cause of the quality of supply complaints, which are separated into eight categories:

- Network equipment faulty
- Network interference by network service provider equipment
- Network interference by another customer
- Network limitation
- Customer internal problem
- No problem identified
- Environmental
- Other

SCONRRR framework complaints

Table 21 categorises the technical QoS complaints that have been received by Horizon Power and Western Power in 2015-16. QoS complaints received over the past six years is in Appendix 3, Table 53.[55]

In 2015-16, the majority of the complaints received by both distributors are categorised as 'other' (technical matters which do not fall into the more specific complaint categories).

Table 21: Technical quality of service complaints received in 2015-16

	Horizon Power	Western Power
Total number of technical QoS complaints	34	1,803
Complaint categories		
Low supply voltage complaints	12	277
Voltage dip complaints	0	72
Voltage swell complaints	0	50
Voltage spike complaints	0	7
Waveform distortion complaints	0	1
TV or radio interference complaints	0	113
Noise from appliances complaints	0	1
Other complaints	22	1,282

Table 22 shows the number of QoS complaints received by each distributor over the past six years.

The number of complaints received by Western Power in 2014-15 and 2015-16 has been adjusted to exclude complaints about electric shock incidents and other incidents reported by Western Power personnel.[56] The adjustment reduces the number of complaints in 2014-15 from 1,889 to 1,746.

[55] Rottnest Island Authority has not received any QoS complaints over the past six years.

[56] Western Power staff are instructed to report these incidents in the Trouble Call System through the call centre, to ensure these matters were recorded and actioned, as required. Western Power now filters the complaints to exclude those raised internally.

Based on the adjusted 2014-15 complaints data, the total number of complaints received by Western Power in 2015-16 increased by 3.3 per cent.

Table 22: Technical quality of service complaints received

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	29	23	30	31	32	34
Rottnest Island Authority	0	0	0	0	0	0
Western Power	2,158	1,307	1,311	2,017	1,746[57]	1,803
State Total	**2,187**	**1,330**	**1,341**	**2,048**	**1,921**	**1,837**

Table 23 shows the likely cause of the technical QoS complaints received by Horizon Power and Western Power.

Horizon Power was unable to identify the cause for 29.4 per cent of the complaints. Where a cause could be identified, 35.3 per cent of complaints were caused by network equipment faults and 26.5 per cent by environmental issues.

Western Power was unable to identify the cause for 37.4 per cent of the complaints it received. Where a cause could be identified, 19.9 per cent were caused by network limitations, 14.5 per cent by customer internal problems, 12.5 per cent by faulty network equipment and 12.0 per cent by other issues.

Table 23: Likely cause of technical quality of service complaints in 2015-16

Likely cause of technical QoS complaints	Horizon Power	Western Power
Network equipment faulty	12	225
Network interference by network service provider equipment	2	9
Network interference by another customer	0	37
Network limitation	0	358
Customer internal problem	0	261
No problem identified	10	675
Environmental	9	22
Other	1	216

Electricity code complaints

Table 24 shows the number of complaints about electricity code matters received by Horizon Power and Western Power over the past six years.

In 2015-16, Horizon Power received 157.0 per cent more complaints. Complaints about administrative and customer service issues increased by 201.2 per cent, and other complaints increased by 59.2 per cent.[58] Horizon Power commented:

[57] Western Power has provided an amended value for 2014-15, which excludes electric shock incidents and other incidents reported by Western Power personnel.

[58] Horizon Power's complaints data covers both retail and distribution related complaints.

> These figures were impacted by incorrect manual meter reading in Broome during December 2015. Customers incorrectly assumed the new AMI [Advanced Metering Infrastructure] meters were at fault.
>
> Additionally Horizon Power's complaints system cannot segment [differentiate] between if the complaint was at the fault of the distributor or retailer due the vertically integrated nature of our business.

Western Power received 3.1 per cent fewer complaints in 2015-16. Administrative and customer service complaints increased by 105.8 per cent, and other complaints were 15.5 per cent lower.

Table 24: Complaints received by electricity distributors (electricity code)

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power[59]						
Administrative and customer service complaints	58	86	414	274	168	506
Other complaints	79	51	55	17	76	121
Total complaints	**137**	**137**	**469**	**291**	**244**	**627**
Western Power						
Administrative and customer service complaints	101	33	25	41	68	140
Other complaints	1,637	679	639	506	592	500
Total complaints	**1,738**	**712**	**664**	**547**	**660**	**640**

Electricity complaint resolution

Figure 9 shows the percentage of complaints resolved within 15 business days by Horizon Power and Western Power.

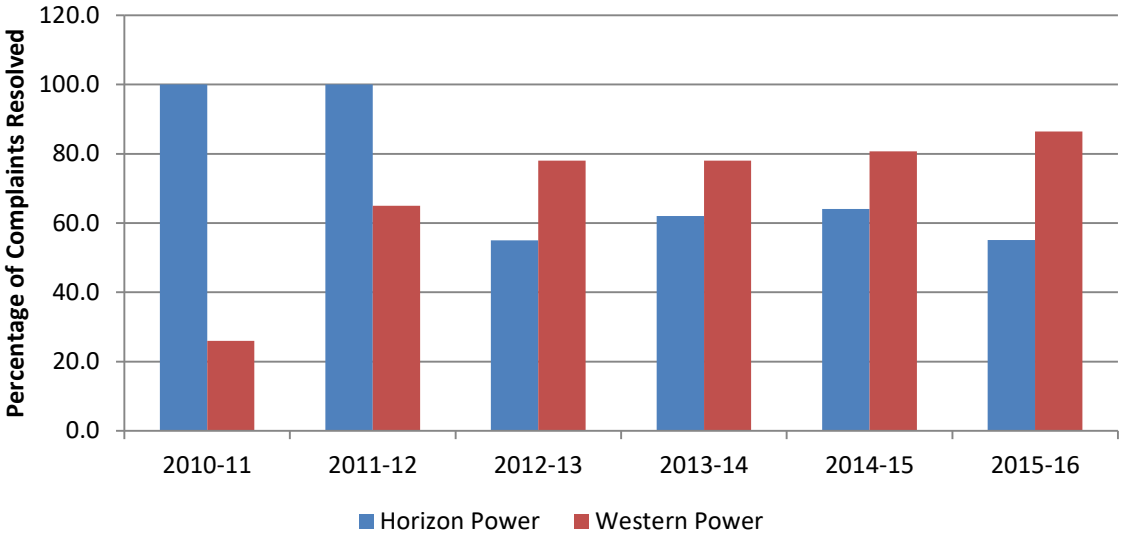
In 2015-16, Western Power resolved 86.4 per cent of complaints within 15 days, which is a six-year high.

Horizon Power resolved 55.1 per cent of complaints in 2015-16, down from 64.1 per cent in 2014-15. The decline in complaint resolution performance coincides with the large increase in the number of electricity code complaints it received in 2015-16.

Horizon Power commented it does not consider a complaint to be concluded until resolution has been reached, and the customer is satisfied. It has satisfied the requirement to respond to the complaint by addressing the matters in the complaint within the 20 business days prescribed in the electricity code.

[59] The Horizon Power complaints data since 2013 is the combined total of complaints about their retail and distribution services, following a change of call centre service provider.

Figure 12: Electricity distributor complaints resolved within 15 business days



Gas complaints

The complaint reporting obligations for gas distributors are in the Gas Distribution Licence Performance Reporting Handbook (gas handbook).

The gas handbook separates complaints into six categories:

- Connection and augmentation - includes quality and timeliness of providing new service connections, or network augmentation works, and lack of capacity preventing a new connection to the system.
- Reliability of supply – includes supply interruptions, both planned and unplanned.
- Quality of supply – includes gas quality or supply pressure.
- Network charges and costs – includes any fee or charge levied by the distributor for the service it provides.
- Administrative processes or customer service - includes meter reading, timeliness of correspondence and other customer communications, the complaints handling process, timeliness of response to a complaint and any other process of a general administrative nature.
- Other - includes poor service, privacy issues and health and safety issues.

Table 25 shows the total number of complaints received by gas distributors.

The number of complaints received by ATCO increased by 117.4 per cent. ATCO explained that the increase is because 2015-16 is the first full year that complaints have been recorded in accordance with the new Australian Gas Association's complaint definitions.[60]

[60] ATCO implemented the system changes in January 2015, which means the 2014-15 complaints data only covers a part year.

Table 25: Complaints received by gas distributors

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	35	36	25	25	236	513
Esperance Power Station	0	0	0	0	0	0
Kleenheat	0	2	0	0	3	1
State Total	**35**	**38**	**25**	**25**	**239**	**514**

Table 26 categorises the complaints received by ATCO and Kleenheat in 2015-16.

The majority of the complaints received by ATCO cover administrative and customer service (41.9 per cent) and other (39.8 per cent).

Table 26: Categorisation of complaints received by gas distributors in 2015-16

Complaint Category	ATCO	Kleenheat
Complaint category		
Connection and Augmentation	52	0
Reliability of Supply	32	0
Quality of Supply	0	0
Network Charges and Costs	14	1
Administrative Processes or Customer Service	211	0
Other	204	0
Total	**513**	**1**

Call centre performance

A significant proportion of customers' interaction with their distributor is by telephone. Consequently, a distributor's responsiveness to telephone calls from customers is an important measure of customer service.

Larger distributors operate call centres, which employ operators to handle customer enquiries and complaints. These call centres may have sophisticated systems to monitor and report on key responsiveness indicators, specifically:

- Percentage of calls answered within 30 seconds.
- Average duration before a call is answered, measured in seconds.
- Percentage of unanswered calls.

Some call centres handle calls about other services provided by the distributor, or a related business, as well as distribution services. Therefore, it may not always be possible for distributors to separately report on their performance for distribution calls. In these circumstances the reported performance will be for all the calls handled by the call centre.

If the call centre uses Interactive Voice Response equipment[61] to handle calls then the responsiveness measures only apply to those calls where the customer has selected an option to speak with an operator.

Smaller distributors offer a simpler telephone service, which is often based on the customer calling a switchboard which connects them to the appropriate contact person. This type of telephone service is not capable of producing responsiveness data.

Electricity distributor call centre performance

All three electricity distributors operate call centres: Horizon Power and Rottnest Island Authority outsource their call centres to other service providers; while Western Power operates an in-house call centre.

The Rottnest Island Authority call centre handles calls for both retail and distribution without distinguishing between them, and also handles calls related to other areas of their business.

Table 27 shows the volume of calls received by each electricity distributor call centre. The total volume of calls received by distributor call centres was 8.2 per cent lower in 2015-16.

Horizon Power was the only distributor to receive more calls in 2015-16. Call volume was up by 11.7 per cent compared to 2014-15. Horizon Power attributed the increase in call volume to the installation of new advanced meters.[62]

The call centres of Rottnest Island Authority and Western Power both received less calls in 2015-16, down by 62.8 per cent and 8.0 per cent respectively.

Western Power attributed the reduction in call volume to customers' increased use of self-service channels, such as their website. In 2015-16, customers visited the mobile outage

[61] Interactive Voice Response equipment allows a call centre telephone system to detect voice and keypad tone signals and then respond with pre-recorded or dynamically generated audio to further direct callers to the service they require.

[62] Refer to the discussion of this issue on pages 33 and 34.

webpage 508,000 times, and 23,800 customers were using the mobile phone app to obtain outage information. There has also been increased usage of social media platforms to respond to customer enquiries.

Rottnest Island Authority attributes the reduction in calls to a number of initiatives to improve its service.[63]

Table 27: Volume of calls to electricity distributor call centres

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	71,215	82,587	103,301	14437	11,452	12,794
Rottnest Island Authority	5,272	5,840	6,173	4,850	5,250	1,955
Western Power	495,626	531,554	510,935	455,368	388,358	357,105
State Total	**572,113**	**619,981**	**620,409**	**474,655**	**405,060**	**371,854**

In order to assess the overall performance of the electricity distributor's call centres it is prudent to examine all three call centre responsiveness measures together.

Figures 13, 14 and 15 show percentage of calls that are answered within 30 seconds, the average waiting time before the call is answered by the call centre and the percentage of calls that are unanswered.

Horizon Power and Western Power reported a deterioration in all three performance measures, while Rottnest Island Authority reported a deterioration in two of the three performance measures, in 2015-16.

Horizon Power attributed the deterioration in performance to the increased volume of calls received by its call centre and changes to the service level agreement with its outsourced call centre provider, to achieve cost reductions identified in its strategic review.

Western Power attributed the deterioration in call centre performance to the transformation from the traditional, telephone based, customer service approach to a more interactive customer self-service model, and its efficiency drive towards a lower cost to serve model. Also, a single storm accounted for the 26 per cent increase in the number of unanswered calls.

Despite a large reduction in the volume of calls to the Rottnest Island Authority call centre in 2015-16, the percentage of unanswered calls increased (from 2.5 per cent to 3.6 per cent) and the percentage of calls answered within 30 seconds fell (from 93.3 per cent to 89.4 per cent).

[63] The initiatives include undertaking more preventative maintenance, and having an increased presence on the island (called "Island Office") during office hours. The office handles all minor maintenance works that previously had to be logged by the Authority's staff via the call centre.

Figure 13: Percentage of electricity distributor calls answered within 30 seconds

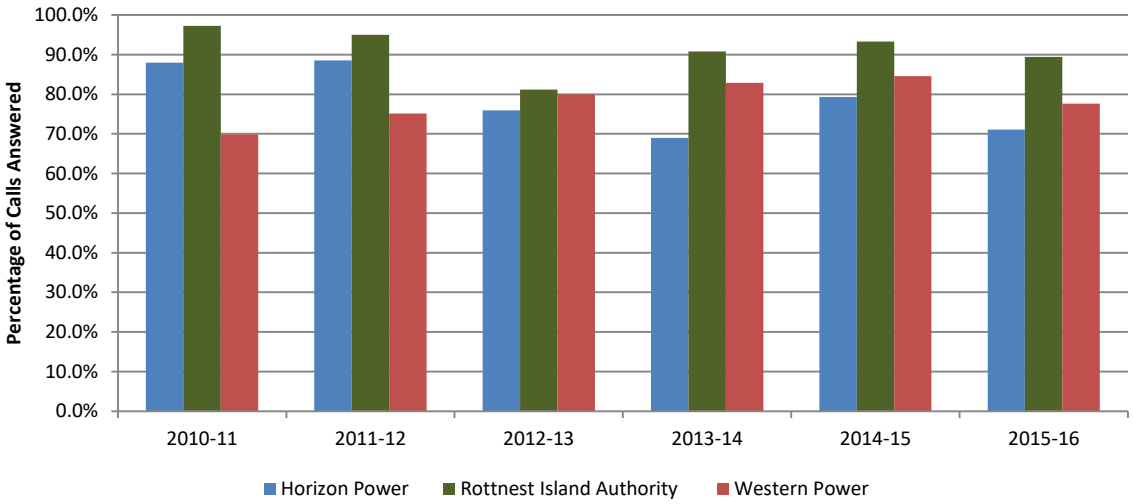


Figure 14: Average duration before a call was answered by electricity distributors

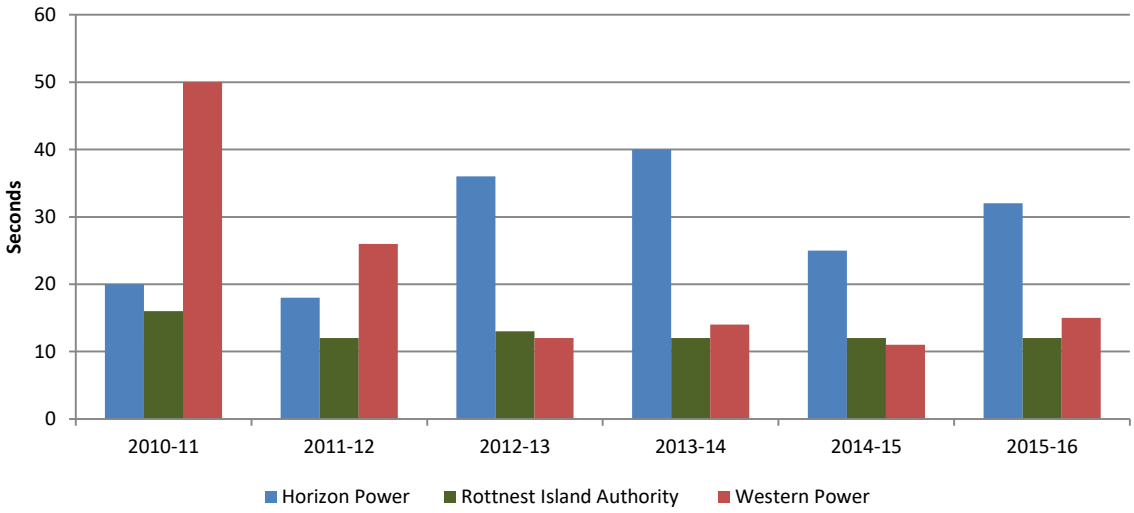
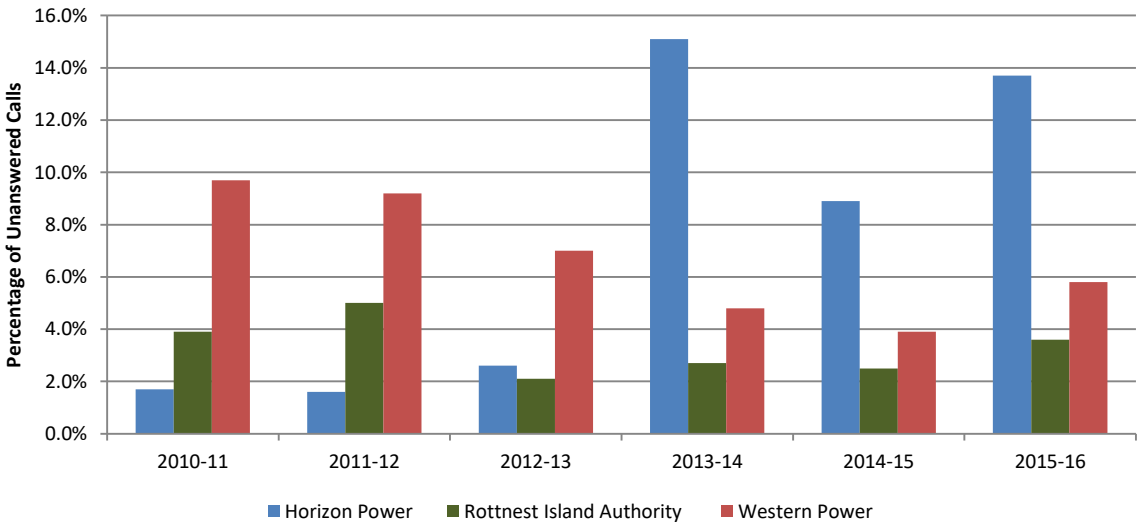


Figure 15: Percentage of calls that were unanswered by electricity distributors



Gas Distributor Call Centre Performance

ATCO and Kleenheat are the only gas distributors that operate call centres.

Caution is needed when interpreting the performance of the Kleenheat call centre, as it handles calls about its retail and distribution operations, as well as calls related to other areas of its business.

Table 21 shows the volume of calls received by the ATCO and Kleenheat call centres. The total volume of calls received by distributor call centres was 3.2 per cent lower in 2015-16.

Table 28: Volume of calls to gas distributor call centres

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	37,391	65,098	66,933	77,388	84,106	84,685
Kleenheat	190,764	214,280	220,710	235,698	233,363	222,505
State Total	**228,155**	**279,378**	**287,643**	**313,086**	**317,469**	**307,190**

Figures 16, 17 and 18 show, for the gas distributor call centres, the percentage of calls that are answered within 30 seconds, the average waiting time before the call is answered by the call centre and the percentage of calls that are unanswered.

The performance of both distributors' call centres against all three measures in 2015-16 was broadly similar to that in 2014-15.

Figure 16: Percentage of gas distributor calls answered within 30 seconds

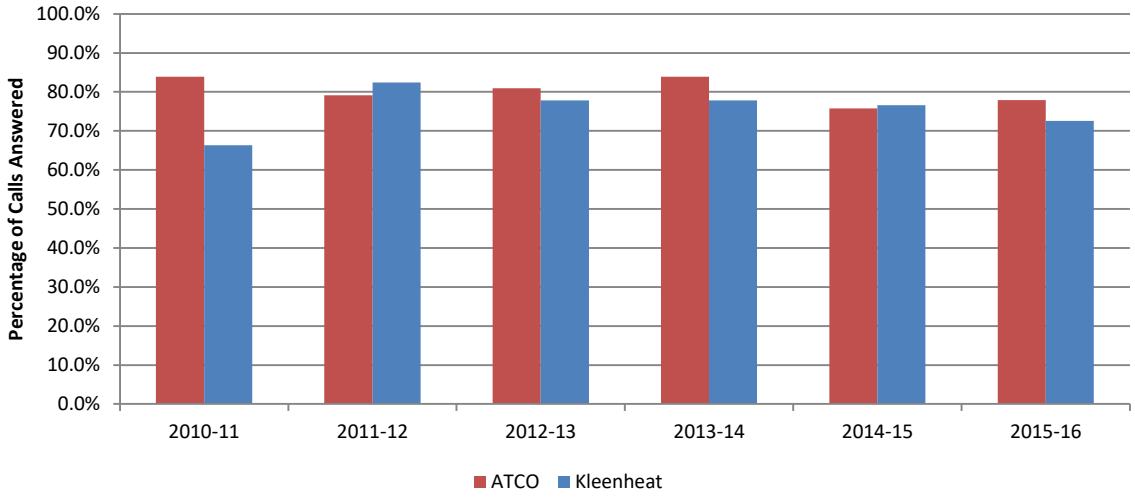


Figure 17: Average duration before a call was answered by gas distributors

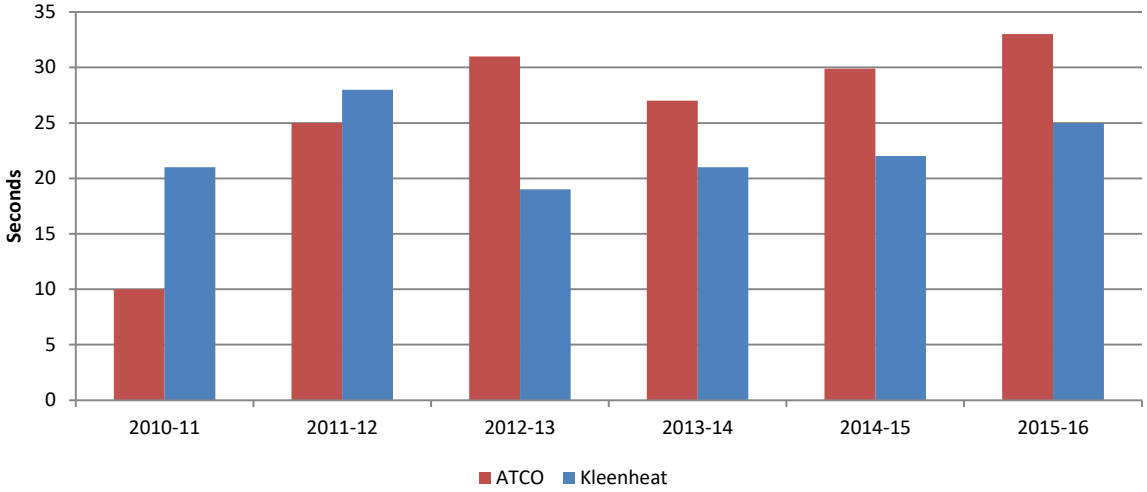
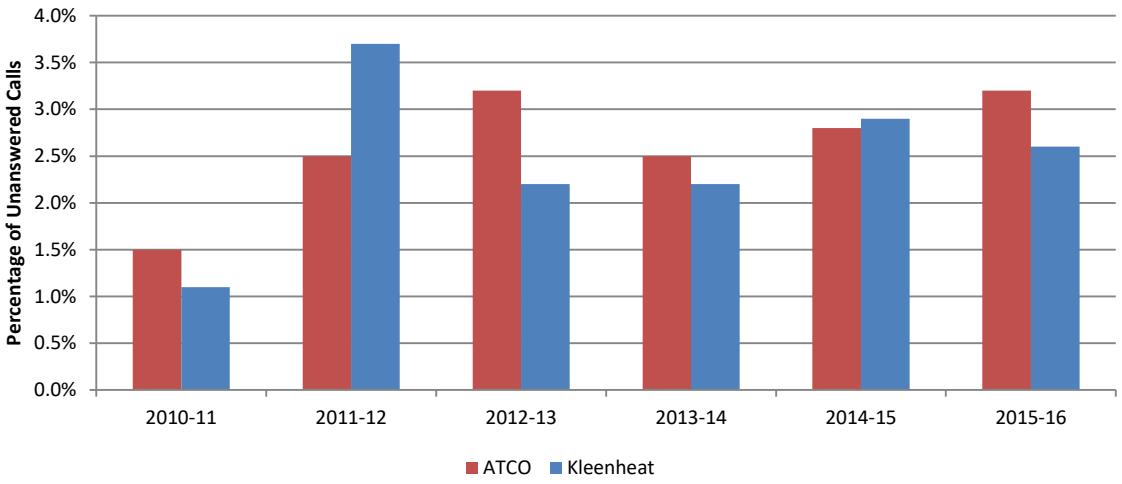


Figure 18: Percentage of calls that were unanswered by gas distributors



Service standard payments

Electricity distributor service standard payments

The electricity code requires distributors to make service standard payments to customers for:[64]

- wrongful disconnection, at a rate of $100 per day;[65] and
- failure to acknowledge or respond to a customer query or complaint within the prescribed timeframes at a rate of $20 for each written query or complaint.[66]

The NQ&R code requires distributors to make service standard payments to customers for:[67]

- failure to give at least 72 hours' notice of a planned supply interruption;[68] and
- supply interruptions that exceed 12 hours in duration.[69]

Rottnest Island Authority has not made any service standard payments to customers over the past six years. Accordingly, Table 22 only provides information about payments made by Horizon Power and Western Power.

Table 29: Service standard payments made by electricity distributors

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Electricity Customer Code - clause 14.4						
Horizon Power	0	0	0	0	0	0
Western Power	1	4	0	0	1	0
Electricity Customer Code - clause 14.5						
Horizon Power	-	-	-	4	2	2
Western Power	-	-	-	14	1	4
NQ&R Code – section 18						
Horizon Power	0	9	1	10	1	6
Western Power	1,158	968	683	751	341	408
NQ&R Code – section 19						
Horizon Power	589	32	34	89	1,618	17
Western Power	24,328	28,800	47,523	15,166	7,509	9,518

The number of payments made by Horizon Power under section 18 of the NQ&R Code was 98.9 per cent lower in 2015-16. The reduction in the number of payments is consistent with

[64] The distributor is only required to make payments for late reconnections and failure to acknowledge a complaint or query if the customer if the customer applies. Payments for wrongful disconnection must be made without application from the customer.

[65] Clause 14.5 of the electricity code.

[66] Clause 14.4 of the electricity code.

[67] The distributor is only required to make payments if the customer if the customer applies. Also, eligibility for payments is limited to customers who consume less than 50MWh per annum.

[68] Clause 18 of the NQ&R code.

[69] Clause 19 of the NQ&R code.

the large reduction in the number of customer premises affected by extended interruptions.[70]

Western Power made more payments under sections 18 and 19 of the NQ&R Code. Payments under section 18 were 19.6 per cent higher in 2015-16. Western Power commented that:

> Planned interruptions continue to be an area of focus for Western Power, with attention being paid to additional customer contact during the notification process.[71]

Payments under section 19 of the NQ&R Code were 26.8 per cent higher in 2015-16. Western Power explained that the increase in payments was:

> […] predominantly due to the Waroona bushfire, storm activity and interruptions caused by total fire bans. Information about EOPS [Extended Outage Payment System] was provided by Western Power's community engagement team at the community forums for the Waroona bushfire, which led to increased customer awareness of their eligibility to claim.[72]

[70] The number of extended interruptions on the Horizon Power systems was much lower in 2015-16. The peak in 2014-15 was caused by tropical cyclones Olwyn and Quang.

[71] Western Power, *Annual Reliability and Power Quality Report (for the year ended 30 June 2016)*, section 8.1.

[72] Western Power, *Annual Reliability and Power Quality Report (for the year ended 30 June 2016)*, section 8.2.

Appendices

Appendix 1 - Electricity distribution system asset information

Table 30 provides an overview of the assets deployed in the distribution systems operated by Horizon Power, Rottnest Island Authority and Western Power as at 30 June 2016.

Table 30: Electricity distribution system assets as at 30 June 2016

Asset Type	Asset Sub-Type/Feeder Class	Horizon Power	Rottnest Island Authority	Western Power
Number of metered supply points	CBD	N/A	N/A	5,601
	Urban	6,614	N/A	734,392
	Short Rural	38,820	190	275,093
	Long Rural	2,108	N/A	98,104
Feeder Length (km)	CBD	N/A	N/A	216
	Urban	336.7	N/A	21,948
	Short Rural	4212.0	44.9	18,068
	Long Rural	3323.8	N/A	53,116
Number of Transformers	Sub-transmission	N/A	2	N/A
	Distribution	4,452	15	68,125
Total Capacity of Transformers (MVA)	Sub-transmission	N/A	2	N/A
	Distribution	786	4	9,827
Number of street lights		19,424	189	259,692
Number of Poles		57,590	56	775,710

Appendix 2 - Gas distribution system construction information

Table 31 provides an overview of the gas pipe assets deployed in the ATCO, Esperance Power Station and Kleenheat distribution systems as at 30 June 2016.

It can be seen that the distribution systems operated by Esperance Power Station and Kleenheat are significantly smaller and not as diverse in terms of the pipe type and system operating pressure as the distribution systems operated by ATCO.

Table 31: Gas distribution network construction information for 2015-16

		ATCO			Esperance Power Station			Kleenheat		
Asset Type	**Type of piping**	**Low Pressure**	**Medium Pressure**	**High Pressure**	**Low Pressure**	**Medium Pressure**	**High Pressure**	**Low Pressure**	**Medium Pressure**	**High Pressure**
Length of gas main (km) constructed from:	Cast Iron	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Unprotected Steel	92.4	43.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Protected Steel	0.0	45.6	717.8	0.0	0.0	0.0	0.0	0.0	0.0
	PVC	3,568.0	6,031.8	0.0	0.0	0.0	0.0	0.0	9.0	0.0
	Polyethylene	75.4	3,185.4	200.1	0.0	35.2	0.0	0.0	27.0[73]	0.0
	Other	6.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total length of distribution mains installed and in service (km)		**3750.8**	**9306.7**	**917.9**	0.0	35.2	0.0	0.0	36.0	0.0
Number of service connections per km of gas mains		52.7			10.7			26.6		

[73] In previous reports the total length of PE pipe was incorrectly reported to be 42.3km.

Appendix 3 - Additional electricity and gas performance data

Table 32: Total small use customer connections on electricity and gas distribution systems

	Electricity							Gas					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**		**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	43,181	44,328	45,866	46,508	47,832	47,168	ATCO	636,323	652,808	673,878	692,988	714,488	736,746
Rottnest Island Authority	83	527	527	527	527	527	Esperance Power Station	280	313	332	342	357	376
Western Power	1,008,525	1,015,679	1,050,232	1,060,588	1,085,657	1,110,196	Kleenheat	862	903	940	956	922	956
State Total	**1,051,789**	**1,060,534**	**1,096,625**	**1,107,623**	**1,134,016**	**1,157,891**	**State Total**	**637,427**	**654,024**	**675,150**	**694,286**	**715,767**	**738,078**

Table 33: Establishment of new customer connections on electricity and gas distribution systems

	New connections on electricity systems							New connections on gas systems					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**		**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	2,157	1,780	2,401	2,797	1,576	860	ATCO	19,611	14,752	15,423	20,273	23,734	24,600
Rottnest Island Authority	0	0	0	0	0	0	Esperance Power Station	14	20	3	8	12	18
Western Power	24,614	21,420	23,994	29,532	33,925	32,589	Kleenheat	54	41	37	15	43	34
State Total	**26,771**	**23,200**	**26,395**	**32,329**	**35,501**	**33,449**	**State Total**	**19,679**	**14,813**	**15,463**	**20,296**	**23,789**	**24,642**

Table 34: Number of customer connections not established on electricity and gas distribution systems within the prescribed time frames

	Number of new connections not established on time						Percentage of total new connections					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Electricity												
Horizon Power	0	2	15	22	16	2	0.0	0.1	0.6	0.8	1.0	0.2
RIA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Western Power	885	446	361	223	189	141	3.6	2.1	1.5	0.7	0.6	0.4
Gas												
ATCO	7	3	2	2	14	287	0.04	0.02	0.01	0.01	0.1	1.2
Esperance Power Station	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Kleenheat	0	0	0	0	8	0	0.0	0.0	0.0	0.0	18.6	0.0

Table 35: Customer reconnections on electricity and gas distribution systems

	Reconnections on electricity systems							Reconnections on gas systems					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**		**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	-	-	1,641	3,502	3,889	1,527	ATCO	-	-	3,692	2,820	7,112	10,875
Rottnest Island Authority	-	-	0	0	0	0	Esperance Power Station	-	-	2	25	30	5
Western Power	-	-	13,908	15,520	16,740	15,202	Kleenheat	-	-	4	2	10	8
State Total	**-**	**-**	**14,003**	**19,022**	**20,629**	**16,729**	**State Total**	**-**	**-**	**3,698**	**2847**	**7,152**	**10,888**

Table 36: Number of customer reconnections not established on electricity and gas distribution systems within the prescribed time frames

	Number of reconnections not established on time						Percentage of total reconnections					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Electricity												
Horizon Power	-	-	5	12	26	0	-	-	0.3	0.3	0.7	0.0
Rottnest Island Authority	-	-	N/A	N/A	N/A	N/A	-	-	N/A	N/A	N/A	N/A
Western Power	-	-	227	224	177	145	-	-	1.6	1.4	1.1	1.0
Gas												
ATCO	-	-	22	15	1	0	-	-	0.6	0.5	0.0	0.0
Esperance Power Station	-	-	0	0	0	0	-	-	0.0	0.0	0.0	0.0
Kleenheat	-	-	0	0	0	0	-	-	0.0	0.0	0.0	0.0

Table 37: Number of customer premises that have experienced interruptions of more than 12 hours

Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	1,138	1,875	587	3,785	6,382	681
Rottnest Island Authority	0	3	0	0	0	0
Western Power	54,414	179,694	38,820	43,750	37,280	39,495
State Total	**55,552**	**181,572**	**39,407**	**47,535**	**43,662**	**40,176**

Table 38: Number electricity customer premises that have experienced multiple interruptions

	Perth CBD and Urban areas, > 9 interruptions						Rural areas, > 16 interruptions					
Distributor	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2010**	**2011**	**2012**	**2013**	**2014**	**2016**
Horizon Power	N/A	N/A	N/A	N/A	N/A	N/A	819	1,176	3,327	1,263	106	268
Rottnest Island Authority	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0
Western Power	6,813	13,224	8,702	12,326	4,755	3,529	435	1,125	2,341	5,154	3,912	3,204
State Total	**6,813**	**13,224**	**8,702**	**12,326**	**4,755**	**3,529**	**1,254**	**2,301**	**5,668**	**6,417**	**4,018**	**3,472**

Table 39: Number of gas customer premises experiencing interruptions exceeding 12 hours and five or more interruptions per annum

	Customers with interruptions to supply >12 hours continuously						Customers with 5 or more supply interruptions					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
ATCO	0	0	640	1,534	743	532	0	0	0	1	1	1
Esperance Power Station	0	0	0	0	0	0	0	0	0	0	0	0
Kleenheat	0	0	0	0	0	0	0	0	0	0	0	0
State Total	**0**	**0**	**640**	**1,534**	**743**	**532**	**0**	**0**	**0**	**1**	**1**	**1**

Table 40: Average duration and frequency of supply interruptions in the Perth CBD (NQ&R Code)

	Duration of Interruptions						Frequency of Interruptions					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rottnest Island Authority	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Western Power	39	31	28	35	33	40	0.3	0.3	0.3	0.3	0.2	0.2

Table 41: Average duration and frequency of supply interruptions in the urban Areas (NQ&R Code)

	Duration of Interruptions						Frequency of Interruptions					
Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rottnest Island Authority	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Western Power	341	405	390	343	326	249	2.7	2.6	2.4	2.2	2.1	1.9

Table 42: Average duration and frequency of supply interruptions in the other areas of the State (NQ&R Code)

	Duration of Interruptions						Frequency of Interruptions					
Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	297	302	318	330	373	359	4.5	3.8	4.1	3.9	3.8	3.7
Rottnest Island Authority	108	226	76	62	62	136	10.6	4	5.1	3.6	2.2	3.7
Western Power	777	947	979	1,020	1,030	992	4.9	5.1	5.3	5.2	5.4	5.4

Table 43: Average duration and frequency of supply interruptions in isolated systems (NQ&R Code)

	Duration of Interruptions						Frequency of Interruptions					
Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Horizon Power	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rottnest Island Authority	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Western Power	-	-	537	505	-	-	-	-	11.6	16.7	-	-

Table 44: Western Power SAIDI performance in 2015-16

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	353.2	51.2	183.2	505.1	1215.8
Distribution Network (Planned)	104.4	21	44.6	147.7	447.6
Distribution Network (Unplanned)	228.4	28.2	128.1	331.5	724.7
Normalised Distribution Network (Unplanned)	152.0	22.6	91.3	168.4	582.6

Table 45: Horizon Power SAIDI performance in 2015-16

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	284	N/A	37.4	247.1	1727.5
Distribution Network (Planned)	46	N/A	4.1	39.0	294.2
Distribution Network (Unplanned)	238	N/A	33.3	208.0	1433.4
Normalised Distribution Network (Unplanned)	199	N/A	31.6	198.7	763.7

Table 46: Rottnest Island Authority SAIDI Performance in 2015-16

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	343	N/A	N/A	343	N/A
Distribution Network (Planned)	38	N/A	N/A	38	N/A
Distribution Network (Unplanned)	305	N/A	N/A	305	N/A
Normalised Distribution Network (Unplanned)	0.0	N/A	N/A	0.0	N/A

Table 47: Western Power SAIFI performance in 2015-16

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	2.13	0.19	1.33	2.7	6.6
Distribution Network (Planned)	0.30	0.06	0.14	0.4	1.3
Distribution Network (Unplanned)	1.56	0.11	1.04	2.0	4.5
Normalised Distribution Network (Unplanned)	1.37	0.10	0.91	1.8	4.0

Table 48: Horizon Power SAIFI performance in 2015-16

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	3.55	N/A	0.92	3.6	10.9
Distribution Network (Planned)	0.23	N/A	0.04	0.2	1.4
Distribution Network (Unplanned)	3.32	N/A	0.89	3.4	9.5
Normalised Distribution Network (Unplanned)	3.08	N/A	0.87	3.2	7.8

Table 49: Rottnest Island Authority SAIFI performance in 2015-16

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	3.7	N/A	N/A	3.7	N/A
Distribution Network (Planned)	0.5	N/A	N/A	0.5	N/A
Distribution Network (Unplanned)	3.2	N/A	N/A	3.2	N/A
Normalised Distribution Network (Unplanned)	0.00	N/A	N/A	0.00	N/A

Table 50: Western Power CAIDI performance in 2015-16

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	166	272	138	185	185
Distribution Network (Planned)	343	328	309	360	356
Distribution Network (Unplanned)	146	265	123	166	161
Normalised Distribution Network (Unplanned)	111	217	101	96	146

Table 51: Horizon Power CAIDI performance in 2015-16

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	79.8	N/A	40.5	68.7	158.2
Distribution Network (Planned)	197.2	N/A	110.7	196.3	206.8
Distribution Network (Unplanned)	71.7	N/A	37.6	61.3	151.0
Normalised Distribution Network (Unplanned)	64.5	N/A	36.4	62.0	98.0

Table 52: Rottnest Island Authority CAIDI performance in 2015-16

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	93	N/A	N/A	92.8	N/A
Distribution Network (Planned)	90	N/A	N/A	74.6	N/A
Distribution Network (Unplanned)	25	N/A	N/A	95.6	N/A
Normalised Distribution Network (Unplanned)	0	N/A	N/A	0.0	N/A

Table 53: Complaints received by electricity distributors and complaints concluded within 15 business days

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Electricity Customer Code Complaints						
Horizon Power	137	137	469	291	244	627
Rottnest Island Authority	0	0	0	0	1	0
Western Power	1,738	712	664	547	660	640
Admin processes and customer service complaints						
Horizon Power	58	86	414	274	168	506
Rottnest Island Authority	0	0	0	0	1	0
Western Power	101	33	25	41	68	140
Other Complaints						
Horizon Power	79	51	55	17	76	121
Rottnest Island Authority	0	0	0	0	0	0
Western Power	1,637	679	639	506	592	500
Technical Quality of Supply[74] complaints						
Horizon Power	29	23	30	31	32	34
Rottnest Island Authority	0	0	0	0	0	0
Western Power	2,158	1,307	1,311	765	1,889	1,803
Customer complaints concluded in 15 business days (quality of supply[75] and electricity code complaints combined)						
Horizon Power	23	30	31	62	177	364
Rottnest Island Authority	-	-	-	-	1	-
Western Power	1,204	919	1,017	1,021	1,320	1,152

[74] This is the number of complaints received about any technical quality of supply issue.

[75] This measures the resolution of complaints that are just about issues related to the standards in Part 2 and section 14(3) of the NQ&R Code.

Table 54: Complaints received by gas distributors (gas compendium) and complaints resolved within 15 business days

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Total number of complaints						
ATCO	35	36	16	2	203	513
Esperance Power Station	0	0	0	0	0	0
Kleenheat	0	2	0	0	3	1
Admin processes and customer service complaints						
ATCO				0	132	211
Esperance Power Station				0	0	0
Kleenheat				0	0	0
Other Complaints						
ATCO				2	71	204
Esperance Power Station				0	0	0
Kleenheat				0	3	0
Customer complaints concluded in 15 business days (Combined total of Gas Compendium and Quality & Reliability Complaints)						
ATCO				100.0%	89.0%	86.5%
Esperance Power Station	-	-	-	-	-	-
Kleenheat				-	100.0%	100.0%

Table 55: Complaints received by Gas Distributors by reliability and quality of supply category

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Total number of complaints						
ATCO	-	-	9	23	33	98
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	1
Connection and augmentation complaints						
ATCO	-	-	4	6	16	52
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	0
Reliability of supply complaints						
ATCO	-	-	2	10	4	32
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	0
Quality of supply complaints						
ATCO	-	-	3	5	5	0
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	0
Network charges and costs complaints						
ATCO	-	-	0	2	8	14
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	1

Table 56: Electricity and gas distributor call centre performance

	Total number of calls						Percentage of answered within 30 seconds					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	71,215	82,587	103,301	14,437[76]	11,452	12,794	88.0	88.5	75.9	69.0	79.3	71.1
RIA	5,272	5,840	6,173	4,850	5,250	1,955	97.3	95.0	81.2	90.8	93.3	89.4
Western Power	495,626	531,554	510,935	455,368	388,358	357,105	69.9	75.1	80.0	82.9	84.6	77.6
Electricity Total	**572,149**	**619,981**	**620,409**	**474,655**	**405,060**							
ATCO	37,391	65,098	66,933	77,388	84,106	84,685	83.9	79.1	80.9	80.9	75.8	77.9
Kleenheat[77]	190,764	214,280	220,710	235,698	233,363	222,505	66.3	82.4	77.8	77.8	76.6	72.6
Gas Total	**228,155**	**279,378**	**287,643**	**313086**	**317,469**							

	Average duration before a call is answered by an operator (seconds)						Percentage of unanswered calls					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	20	18	36	40	25	32	1.7	1.6	2.6	15.1	8.9	13.7
RIA	16	12	13	12	12	12	3.9	5.0	2.1	2.7	2.5	3.6
Western Power	50	26	12	14	11	15	9.7	9.2	7.0	4.8	3.9	5.8
ATCO	10	25	31	27	30	33	1.5	2.5	3.2	2.7	2.8	3.2
Kleenheat	21	28	19	21	22	25	1.1	3.7	2.2	2.2	2.9	2.6

[76] Since 2013-14, Horizon Power has been reporting performance for its distribution operations. Previously, the data also included calls about its retail operations.

[77] The Kleenheat call centre also handles calls for other Wesfarmers Kleenheat gas businesses. The data presented in this table includes all calls to the Kleenheat call centre.

Table 57: Residential and non-residential gas consumption

	Residential gas consumption (GJ)						Non-residential gas consumption (GJ)					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
ATCO[78]	10,563,707	9,528,366	10,017,511	10,087,162	9,816,762	10,049,915	1,203,416	1,177,507	1,241,075	1,263,629	1,286,095	1,319,166
Esperance Power Station	6,268	5,506	3,567	3,969	3,981	4,014	250	243	26,481	28,276	32,669	32,342
Kleenheat	3,060	3,536	6,293	6,769	7,489	7,348	25,152	4,666	227	194	225	218
State Total	**10,573,035**	**9,537,408**	**10,027,371**	**10,193,727**	**9,828,232**	**10,061,277**	**17,423,028**	**16,638,050**	**1,267,783**	**1,865,260**	**1,318,989**	**1,351,726**

Table 58: Percentage of unaccounted for gas on distribution systems

	Unaccounted for Gas (GJ)						Percentage unaccounted for gas					
Distributor	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
ATCO[79]	866,667	920,371	813,898	707,191	705,987	715,966	-	-	-	-	-	-
Esperance Power Station	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Kleenheat	931	1,158	866	943	529	562	17.7	3.0	13.3	13.5	6.9	7.4

[78] ATCO's gas consumption data is based on calendar year from January to December.

[79] It is not possible to calculate UFG on the ATCO networks, because the UFG includes gas supplied to large use customers, while the gas consumption is restricted to small use customers.

Table 59: Gas mains leak repairs

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	600	830	835	842	575	781
Esperance Power Station	0	0	2	0	0	2
Kleenheat	1	0	1	1	25	41
State Total	**601**	**830**	**838**	**843**	**600**	**824**

Table 60: Gas meter leak repairs

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	1,008	816	486	471	3,527[80]	3,209
Esperance Power Station	0	0	0	0	0	0
Kleenheat	0	1	0	2	0	44
State Total	**1,008**	**817**	**240**	**473**	3,527	**3,253**

Table 61: Gas property service connection meter repairs

Distributor	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ATCO	6,003	5,657	6,614	7,182	5,575	6,040
Esperance Power Station	1	0	3	0	1	2
Kleenheat	0	0	0	0	42	5
State Total	**6,004**	**5,657**	**2,131**	**7,182**	**5,618**	**6,045**

[80] ATCO commented that "the increase in meter leaks is due to the inclusion of regulator leaks, which were previously included in the connection leaks statistic. During the reporting period, ATCO enhanced its reporting process to enable regulator leaks to be distinguished from other connection leaks, and more accurately categorising them as meter leaks".

Table 62: Number of street lights and street light faults logged by distributors in each region

	Total number of streetlights						Street light faults logged					
Metropolitan	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	5,293	5,441	5,993	8,325	8,022	8,332	168	180	108	149	158	130
Western Power	192,890	198,070	199,767	207,146	213,526	219,734	35,912	34,271	36,525	33,447	28,647	28,388
State total	**198,183**	**203,511**	**205,760**	**215,471**	**221,548**	**228,066**	**36,080**	**34,451**	**36,633**	**33,596**	**28,805**	**28,518**
	Total number of streetlights						**Street light faults logged**					
Regional	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	9,610	9,978	10,331	11,298	11,007	11,092	156	168	166	168	177	183
RIA	190	190	190	190	189	189	36	18	46	18	112	79
Western Power	37,018	37,595	37,907	38,539	39,202	39,769	2,922	3,137	3,414	3,220	3,428	4,061
State total	**46,818**	**47,763**	**48,428**	**50,027**	**50,398**	**51,050**	**3,114**	**3,323**	**3,626**	**3,406**	**3,717**	**4.323**

Table 63: Metropolitan and regional area street light faults that are repaired after the prescribed timeframes in each region

	Number of faults fixed in > 5 days						Percentage					
Metropolitan	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	48	51	13	30	10	21	28.6	28.3	7.8	20.1	6.3	16.2
Western Power	1,134	1,050	899	218	215	421	3.2	3.1	2.5	0.7	0.8	1.5
State total	**1,182**	**1,101**	**912**	**248**	**225**	**442**						
	Number of faults fixed in > 9 days						**Percentage**					
Regional	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Horizon Power	17	5	1	14	27	40	10.9	3.0	0.9	8.3	15.3	21.9
Rottnest Island Authority	0	7	11	4	0	7	0.0	38.9	23.9	22.2	0.0	8.9
Western Power	83	91	173	32	15	19	2.8	2.9	5.1	1.0	0.4	0.5
State total	**100**	**103**	**185**	**50**	**32**	**66**						

Appendix 4 – Additional information about distribution system reliability measures

NQ&R code reliability measures

Schedule 1, clauses 11 and 13 of the NQ&R code specify the system reliability measures that distributors are to report, and how to calculate them.

Clause 11 specifies four reliability measures:

- the average total length of all interruptions of supply to customer premises expressed in minutes (this is equivalent to CAIDI);
- the average length of interruption of supply to affected customer premises expressed in minutes (this is equivalent to SAIFI);
- the average number of interruptions of supply to affected customer premises; and
- the average percentage of time that electricity has been supplied to customer premises (this is equivalent to SAIDI).

Clause 13(3) of defines the average value of interruptions as:

- the average of the interruptions for each year for the four years ending in the current reporting period; and
- the average of the four (annual) values.

The calculation in clause 13 gives a four year average value for each of the measures in clause 11.

Distributors are required to report the four reliability measures in clause 11 for each discrete area of the State defined in Schedule 1, clause 2 of the NQ&R code:

- the Perth CBD;
- the urban areas other than the Perth CBD; and
- all other areas of the State.

SCONRRR definitions of overall and normalised interruptions

The overall SAIDI, SAIFI and CAIDI measures all sustained interruptions (including those caused by generation outages, transmission outages, planned interruptions, unplanned interruptions and directed load shedding).

The normalised SAIDI, SAIFI and CAIDI measures unplanned sustained interruptions that are caused by factors under the control of the distributor. Unplanned interruptions caused by generation outages, transmission outages and directed load shedding are excluded, as are unplanned outages where the daily SAIDI exceeds the Major Event Day (**MED**) threshold.

Section 4.5 of Standard *IEEE 1366-2003 - Guide for Electric Power Distribution Reliability Indices, Institute for Electrical and Electronic Engineers* (**IEEE 1366**) describes a statistical approach to calculate the SAIDI threshold for a MED. The calculation of the MED threshold is based on the SAIDI associated with all of the interruptions that occurred during the reporting period, which is typically one year.[81]

The purpose of calculating the MED threshold is to remove days where the daily system SAIDI is much larger than the distribution system average for the reporting period.[82] This approach allows major events to be separately studied from normal daily operation. This exposes trends in daily operation of the system that would otherwise be hidden by the MEDs.[83]

It is important to note that, although the SAIDI is used to identify MEDs, the system SAIFI and CAIDI should be calculated based on the removal of the MED values.

The Australian Energy Regulator also uses standard IEEE 1366 to calculate normalised values for SAIDI, SAIFI and CAIDI for the distribution systems in the National Electricity Market (**NEM**).[84] Adopting IEEE 1366 to calculate the normalised system reliability of Western Australian distributors provides opportunities to benchmark their performance with that of comparable distributors in the NEM.

SCONRRR distribution feeder classifications

The table below provides the definitions for the four types of feeder in the SCONRRR framework.

Table 64: Distribution feeder classifications (SCONRRR)

Description			
CBD[85]	**Urban**	**Short Rural**	**Long Rural**
A feeder supplying predominantly commercial, high rise buildings, supplied by a predominantly underground distribution network containing significant interconnection and redundancy compared to urban areas.	A feeder, which is not a CBD feeder, with actual maximum demand over the reporting period per total feeder route length greater than 0.3MVA/km.	A feeder, which is not a CBD or urban feeder, with a total feeder route length less than 200km.	A feeder, which is not a CBD or urban feeder, with a total feeder route length greater than 200km.

[81] The reporting period used for this report is the year ending 30 June.

[82] The calculation of the MED threshold uses the natural logarithms of the daily SAIDI values. The MED threshold is set at 2.5 log-standard deviations above the log-average of the SAIDI data set for the reporting period.

[83] Some regulators require distributors to separately report on the cause(s) of interruptions that occurred during MEDs. Often MEDs result from severe weather events, bushfires and the failure of critical network infrastructure beyond the control of the distributor.

[84] The National Electricity Market covers the ACT, New South Wales, South Australia, Queensland, Tasmania and Victoria.

[85] The Perth CBD area is defined as the areas supplied from the Milligan Street Zone Substation or the Hay Street Zone Substation.