2017 Annual Performance Report
Energy Distributors

January 2018

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WESTERN AUSTRALIA

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Executive summary

The ERA has reported data on electricity distributor performance since 2007, and on gas distributor performance since 2008.

Growth in new connections has slowed down

There were 25,579 new electricity connections in 2016-17, compared to 33,449 new connections in 2015-16. Western Power added 25,029 new connections (down from 32,589 in 2015-16) and Horizon Power added 549 new connections (down from 860 in 2015-16).

There were 16,871 new gas connections in 2016-17, compared to 24,652 connections in 2015-16. ATCO Gas Australia (**ATCO**) added 16,814 new connections (down from 24,600 in 2015-16).[1]

Although there were fewer new connections on electricity and gas distribution systems, the total number of connections increased. Total electricity connections increased from 1.158 million in 2015-16 to 1.178 million in 2016-17, and total gas connections increased from 738,080 to 751,728 over the same period.

The growth in new connections on distribution systems is closely linked to conditions in the property development market. Lower growth in new connections in 2016-17 correlates with a general slowdown in property development activity, particularly in Perth, due to an oversupply in the market.

More electricity reconnections

The number of reconnections on electricity distribution systems increased from 16,729 in 2015-16 to 32,471 in 2016-17. Reconnections on Western Power's distribution systems increased from 15,202 to 22,313 and on Horizon Power's systems from 1,527 to 10,158.

The increase in reconnections on Horizon Power's network was mostly due to replacing existing meters with new smart meters under its Advanced Metering Infrastructure program. There was also an increase in reconnections following customer disconnections for failure to pay a bill. Prior to the installation of smart meters it was often not cost effective for Horizon Power to disconnect or reconnect a property manually. These properties can now be disconnected and reconnected remotely by the smart meter.

The increase in reconnections on the Western Power distribution systems is due to an increase in requests from retailers. Some of the increase can be explained by an increase in customer reconnections following disconnection for failure to pay a bill.[2]

Household gas consumption at a six-year high

Household gas consumption was at a six year high in 2016-17. Total residential consumption increased from 10.061 million gigajoules in 2015-16 to 11.049 million gigajoules in 2016-17.

[1] The other new connections were on small gas distribution networks operated by Esperance Power Station and Wesfarmers Kleenheat Gas.

[2] This is discussed in the ERA's *2017 Annual Performance Report – Energy Retailers*, which is available at: https://www.erawa.com.au/electricity/electricity-licensing/performance-reports.

The majority of the increase was due to increased consumption by households connected to the ATCO distribution systems, which increased from 10.050 million gigajoules to 11.036 million gigjoules.

Consumption on the small gas distribution systems operated by Kleenheat increased by 16.1 per cent, up from 7,348 gigajoules in 2015-16 to 8,531 gigajoules in 2016-17.

The unusually large increase in gas consumption was likely due to the combined effect of new customer connections on the distribution systems and cold weather in the autumn and winter of 2017.

About this Report

The ERA is the independent economic regulator in Western Australia responsible for administering the licensing schemes for energy distributors.[3]

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.[4] This is the seventh annual report on distributor performance.[5]

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

Performance reporting obligations only apply to small use customers, as defined under the relevant electricity and gas licensing legislation. "Small use customers" are residential and business customers whose annual consumption is less than 160 megawatt hours 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.[6]
- Reliability: supply interruptions on electricity and gas distribution systems. Electricity distribution system reliability is reported against the measures in the NQ&R Code[7] and the SCONRRR framework.[8]
- Gas consumption and unaccounted for gas: this 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: gas main leaks, customer connection leaks and meter leaks on gas distribution systems.
- Streetlight repairs: the number of streetlights in metropolitan and regional areas, what proportion of those lights were repaired, and how many repairs were completed within the prescribed timeframe.
- Complaints: customer satisfaction 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).
- Call centre performance: ease of customers' contact with their distributor by telephone using three industry standard responsiveness measures.

[3] 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).

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

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

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

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

[8] 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).

- Service standard payments: the number of payments made by electricity distributors for wrongful disconnection, failure to give 72 hours' notice of a planned supply interruption, supply interruptions that exceed 12 hours and failing to provide a timely response to complaints.

Energy distribution market overview

This section looks at:

- the total number of electricity and gas distributors;[9]
- 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

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Electricity						
Licensed distributors	6	6	7	7	7	7
Distributing to small use customers	3	3	3	3	3	3
Gas						
Licensed distributors	3	3	3	3	3	3

Electricity distribution licensees that supply small use customers are:

- Regional Power Corporation (**Horizon Power**)
- Rottnest Island Authority
- Electricity Networks Corporation (**Western Power**)

Holders of gas distribution licences are: [10]

- ATCO Gas Australia (**ATCO**)
- Wesfarmers Kleenheat Gas Pty Ltd (**Kleenheat**)
- Esperance Power Station

The number of licensed electricity and gas distributors has been stable 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.[11] By the end of 2006, there were eight distribution

[9] This includes electricity distributors that supply large use customers only (customers whose annual consumption is more than 160 megawatt hours).

[10] The licensing scheme in Part 2A of the Gas Act only covers distribution systems that supply small use customers.

[11] The Electricity Act 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.

licences in force. In 2010, two of the eight distributors surrendered their licence. The ERA also issued one new licence in 2013.[12]

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

The ERA took over responsibility for licensing gas distributors from the (former) Office of Energy[13] in 2005. At that time, there were three licensed gas distributors that are all still licensed today.

[12] This licence authorised the distributor to supply large use customers only.

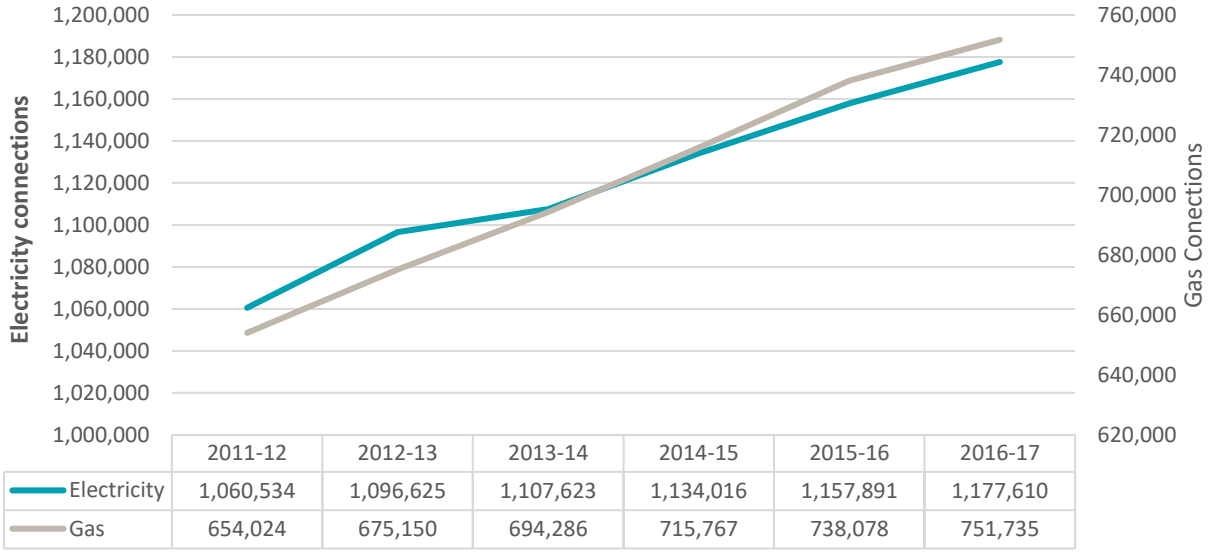
[13] Office of Energy responsibilities are now undertaken by the Department of Treasury, Public Utilities Office.

Customer connections

Throughout the remainder 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 2016-17, electricity connections increased by 1.7 per cent and gas connections increased by 1.9 per cent. Since 2011-12, electricity connections have increased by 11 per cent, and gas connections have increased by 14.9 per cent.

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



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Electricity	1,060,534	1,096,625	1,107,623	1,134,016	1,157,891	1,177,610
Gas	654,024	675,150	694,286	715,767	738,078	751,735

Connections on electricity distribution systems

Table 2 shows the number of connections on each electricity distributor's system. In 2016-17, Western Power had 95.8 per cent of the total and Horizon Power 4.1 per cent.

Table 2: Electricity connections by distributor

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Horizon Power	44,328	45,866	46,508	47,832	47,168	48,748
Rottnest Island Authority	527	527	527	527	527	528
Western Power	1,015,679	1,050,232	1,060,588	1,085,657	1,110,196	1,128,334
Total	**1,060,534**	**1,096,625**	**1,107,623**	**1,134,016**	**1,157,891**	**1,177,610**

Between 2015-16 and 2016-17, the number of connections on Western Power and Horizon Power's distribution systems increased by 1.6 per cent and 3.3 per cent respectively. A single new connection was added to the Rottnest Island Authority's distribution system to connect the island's new 600 kilowatt solar power system.

Electricity distributors are subject to timeliness requirements when connecting new premises. The *Electricity Industry (Obligation to Connect) Regulations 2005* prescribe the conditions for, and the timeframes 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 not established on time (**late connections**) over the past two years.

The total number of new connections in 2016-17 was 23.5 per cent lower than in 2015-16. Both Western Power and Horizon Power reported a fall in the number of new connections, by 23.2 per cent and 36.2 per cent respectively.

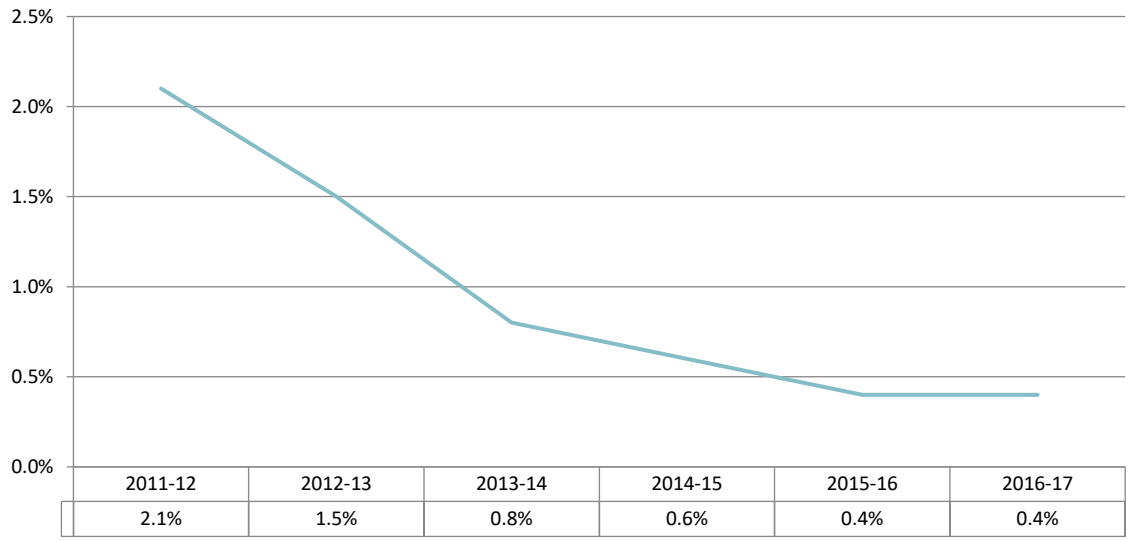
Horizon Power reduced its proportion of late connections (from total new connections) to zero in 2016-17, while Western Power maintained similar performance to last year.

Table 3: New connections on electricity distribution systems

Distributor	2015-16			2016-17		
	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	860	2	0.2	549	0	0
Rottnest Island Authority	0	-	-	1	0	0
Western Power	32,589	141	0.4	25,029	91	0.4
Total	**33,449**	**143**	**0.4**	**25,579**	**91**	**0.4**

Figure 2 shows the proportion of late connections to total new connections on the Western Power distribution system over the past six years.

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 2016-17 ATCO had 99.8 per cent of the total.

Between 2015-16 and 2016-17, total connections on gas distribution systems increased by 1.8 per cent. The number of connections on ATCO's system and Esperance Power Station's system increased by 1.8 per cent and 1.9 per cent respectively. The total connections on Kleenheat's systems increased by five per cent.

Table 4: Gas connections by distributor

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	652,808	673,878	692,988	714,488	736,746	750,339
Esperance Power Station	313	332	342	357	376	383
Kleenheat	903	940	956	922	958[14]	1,006
State Total	**654,024**	**675,150**	**694,286**	**715,767**	**738,080**	**751,728**

Table 5 shows the number of new gas connections that were provided after the date agreed with the customer (late connection). With one late connection, Kleenheat was the only distributor to report late connections in 2016-17. All of ATCO's 16,814 new connections were delivered on time, which represents a substantial improvement on 2015-16, when 287 of the 24,600 new connections were not made on time.[15]

Table 5: New connections on gas distribution systems

Distributor	2015-16			2016-17		
	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	24,600	287	1.2	16,814	0	0.0
Esperance Power Station	18	0	0.0	9	0	0.0
Kleenheat	34	0	0.0	48	1	2.1
Total	**24,652**	**287**	**1.2**	**16,871**	**1**	**0.0**

[14] This was erroneously reported as 956 by Kleenheat in 2015-16.

[15] In the ERA's *2016 Annual Performance Report - Energy Distributors*, it was reported that ATCO's unusually high number of late connections in 2015-16 was because its new contractor had short term resourcing issues, which were subsequently resolved.

Reconnections on electricity and gas distribution systems

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

The prescribed timeframes for electricity distributors are in clause 8.2 of the electricity code and the timeframes 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 increased by 94.1 per cent in 2016-17. Horizon Power and Western Power both reported increases in reconnections, by 565.2 per cent and 46.8 per cent respectively.

The number of reconnections is driven by retailer requests to the distributor to carry out this service; therefore, distributors do not always know the cause of the reconnection. Horizon Power is different, because it is also the retailer for customers on its distribution systems it knows the reasons for reconnections. The increase in reconnections on Horizon Power's network was mostly due to replacing existing meters with new smart meters under its Advanced Metering Infrastructure (**AMI**) program. There was also an increase in reconnections following customer disconnections for failure to pay a bill. Prior to the installation of smart meters it was often not cost effective for Horizon Power to disconnect or reconnect a property manually. These properties can now be disconnected and reconnected remotely by the smart meter.

ATCO performed almost all of the reconnections on gas distribution systems in 2016-17. Compared to 2015-16, the number of reconnections on ATCO's system was 3.1 per cent higher in 2016-17.

Table 6: Reconnections on electricity and gas distribution systems

	Reconnections on electricity systems					Reconnections on gas systems			
Distributor	**2013-14**	**2014-15**	**2015-16**	**2016-17**		**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	3,502	3,889	1,527	10,158	ATCO	2,820	7,112	10,875	11,212
Rottnest Island Authority	0	0	0	0	Esperance Power Station	25	30	5	0
Western Power	15,520	16,740	15,202	22,313	Kleenheat	2	10	8	6
Total	**19,022**	**20,629**	**16,729**	**32,471**	**Total**	**2,847**	**7,152**	**10,888**	**11,218**

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

In 2016-17, there was only one late reconnection on a gas distribution system, which was on ATCO's system. Western Power was the only electricity distributor to provide late reconnections in 2016-17. The proportion of late reconnections in 2016-17 is similar to 2015-16.

Table 7: Reconnections not provided on time

Distributor	2015-16 Reconnections			2016-17 Reconnections		
	Number	Number not on time	% not on time	Number	Number not on time	% not on time
Electricity						
Horizon Power	1,527	0	0.0	10,158	0	0.0
Rottnest Island Authority	0	0	0.0	0	0	0.0
Western Power	15,202	145	1.0	22,313	222	1.0
Gas						
ATCO	10,875	0	0.0	11,212	1	0.0
Esperance Power Station	5	0	0.0	0	0	0.0
Kleenheat	8	0	0.0	6	0	0.0

Electricity distribution system reliability

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

- NQ&R Code; and
- SCONRRR framework.[16]

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 had interruptions that exceed 12 hours continuously (**extended interruption**); and
- The number of customer premises that have had more than:
  - Nine interruptions per annum in the Perth CBD[17] 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 NQ&R Code both measure distribution system reliability through three main performance indicators:[18] [19]

- 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 had a supply interruption.
- Customer Average Interruption Duration Index (**CAIDI**) – measures the total duration of supply interruption for only those customers who have had 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 what caused an interruption and its duration. This differs from other reliability measurement frameworks that are commonly used, such as the SCONRRR framework.[20]

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[16] 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**).

[17] 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.

[18] 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*.

[19] The NQ&R Code does not use the terms SAIDI, SAIFI and CAIDI. See Appendix 4 for more information.

[20] 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

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.[21]
- There are four types of feeder – CBD, Urban, Short Rural and Long Rural.[22]

System reliability standards

Section 13(2) of the NQ&R Code includes standards for the average total length of interruptions[23] in the three defined areas of the State:[24]

- Perth CBD – 30 minutes;
- urban areas other than the Perth CBD (**urban areas**) – 160 minutes;[25] 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 capacity 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 subject to reliability performance standards (under its access arrangement service standard benchmarks).[26] 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.[27]

caused by severe weather events, third party actions, generation outages and transmission network outages are excluded.

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

[22] The definition of each feeder type is in Table 65, Appendix 4.

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

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

[25] These areas are defined in section 3 of the NQ&R Code and include: the Perth metropolitan region, Albany, Bunbury, Geraldton, Kalgoorlie and Mandurah.

[26] 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.

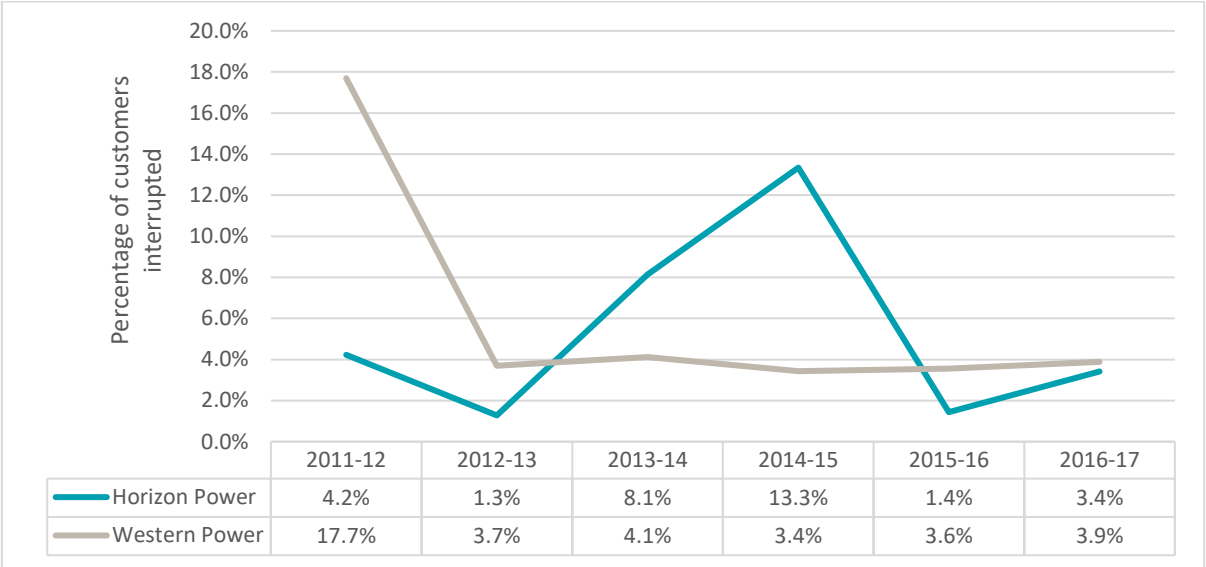
[27] The reliability of distributors in the National Electricity Market is calculated using a framework that is very similar to the SCONRRR framework. See Appendix 4 for more information.

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 had an extended interruption.[28]

Figure 3: Horizon Power and Western Power extended interruptions[29]



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Horizon Power	4.2%	1.3%	8.1%	13.3%	1.4%	3.4%
Western Power	17.7%	3.7%	4.1%	3.4%	3.6%	3.9%

Because of unpredictable environmental factors like severe storms or bush fires, the number of customers affected by extended interruptions varies each year.

Over the past six years, the proportion of customer premises on Western Power's distribution system that have had an extended interruption was between 3.4 per cent and 17.7 per cent.[30] Excluding 2011-12, the average percentage of affected customer premises each year is 3.7 per cent.

The number of extended interruptions on the Horizon Power system was slightly lower than Western Power in 2016-17. The peak in 2014-15 was caused by tropical cyclones Olwyn and Quang.

The Rottnest Island Authority reported that there were no extended interruptions to customer premises during 2016-17.

Multiple interruptions

Figure 4 shows the number of customer premises that had more than the prescribed number of interruptions (**excess interruptions**) in the Perth CBD and urban areas (both exclusively

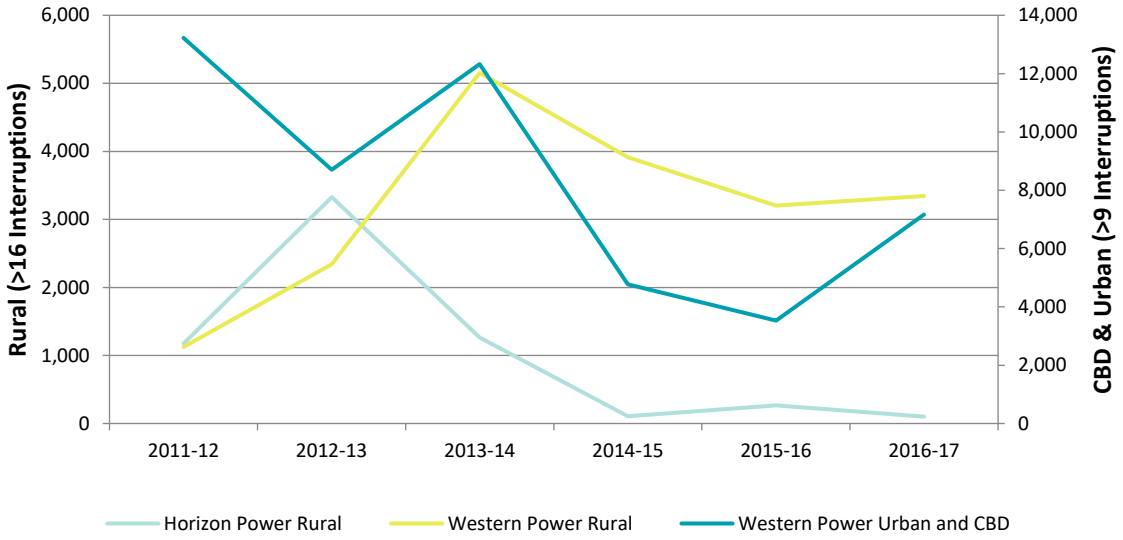
[28] The Rottnest Island Authority is excluded from Figure 3, because the number of extended interruptions on their system over the past six years is small compared to Horizon Power and Western Power. The data for the Rottnest Island Authority can be found in Appendix 3, Table 37.

[29] Due to an error, the 2016 Distributor's Report reported Western Power's performance as slightly lower between 2011-12 and 2015-16 than it actually was. Figure 3 contains the correct data for those years.

[30] 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.

supplied by Western Power) and in rural areas (where all three distributors have distribution systems[31]).

Figure 4: Multiple supply interruptions on electricity distribution systems



Because the same factors that influence the number of extended interruptions also influence the number of excess interruptions, the number of customer premises experiencing excess interruptions each year is variable.

In 2016-17, premises that had excess interruptions in Horizon Power's areas decreased by 62.3 per cent (from 268 to 101 premises).

Customer premises affected by excess interruptions in the combined Perth CBD and urban areas were 103.1 per cent higher in 2016-17 than in 2015-16, and those in Western Power's rural areas were 4.4 per cent higher. Western Power attributed the increase in excess interruptions to unplanned outages caused by weather and a large volume of planned work to replace overhead conductors in Perth and Bunbury.

System reliability

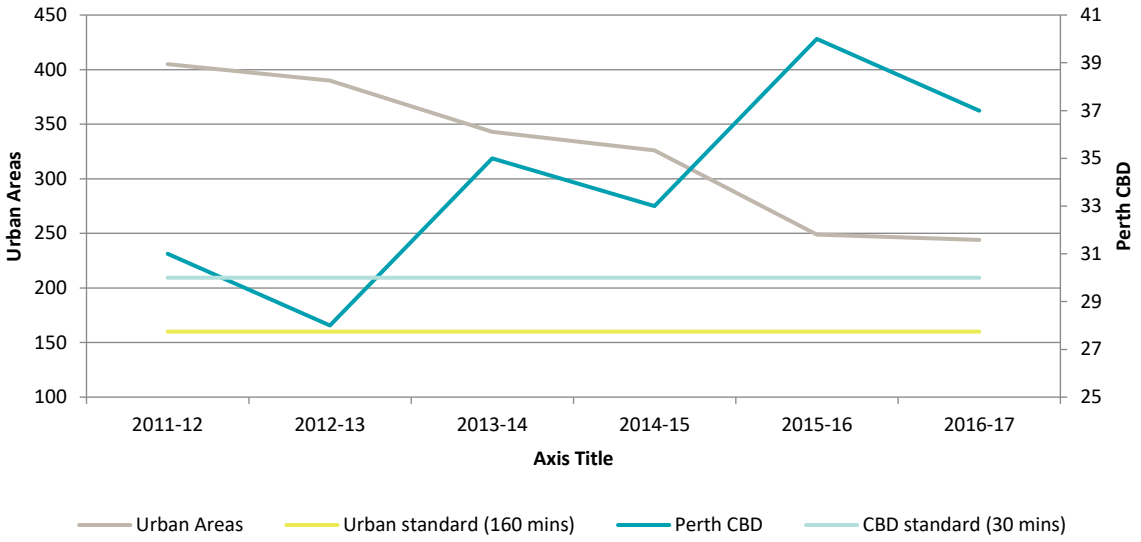
System reliability in the Perth CBD and urban areas

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.

[31] The Rottnest Island Authority has been excluded from Figure 4 because it has not reported any excess interruptions to customer premises over the past six years.

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

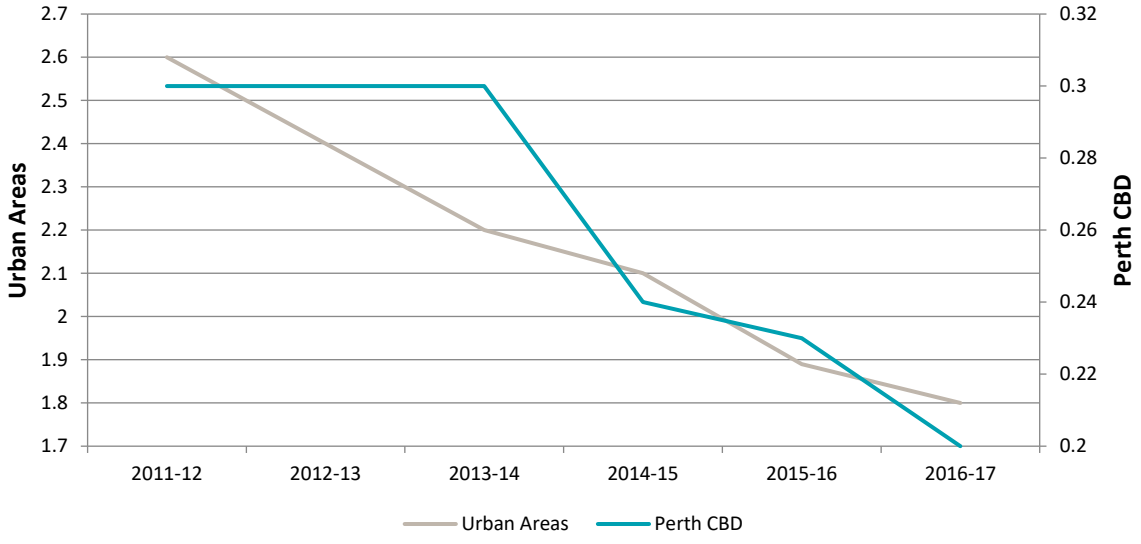


The average total length of interruptions in both the Perth CBD and urban systems exceeded their respective NQ&R standards[32] – in the Perth CBD by seven minutes (or 23 per cent) and in the urban areas by 84 minutes (or 52.5 per cent).

In 2016-17, the average total length of interruptions in the Perth CBD was 37 minutes, down from 40 minutes in 2015-16. The average total length of interruptions in urban areas continued its downward trend. In 2016-17, the average length of interruptions in urban areas was a six-year low of 244 minutes.

Figure 6 shows the average frequency of supply interruptions for customers in the Perth CBD and urban areas. In 2016-17, the frequency of supply interruptions in both areas were at six-year lows, at 0.2 interruptions per connection in the Perth CBD and 1.8 interruptions per connection in urban areas.

Figure 6: Average frequency of interruptions in Perth CBD and urban areas (interruptions per year)

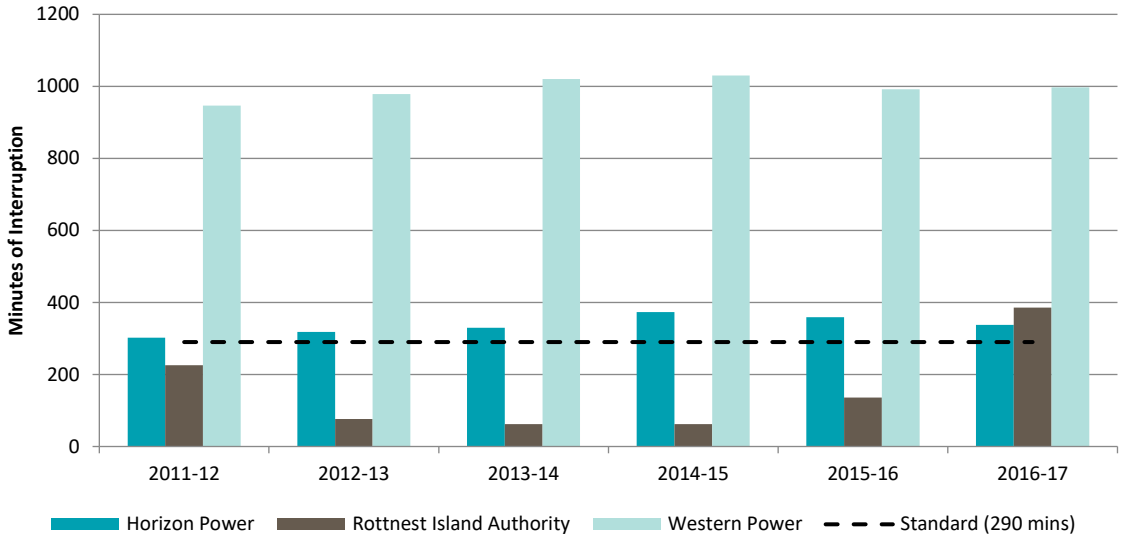


[32] The standards are 30 minutes for the Perth CBD and 160 minutes for urban areas.

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.

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



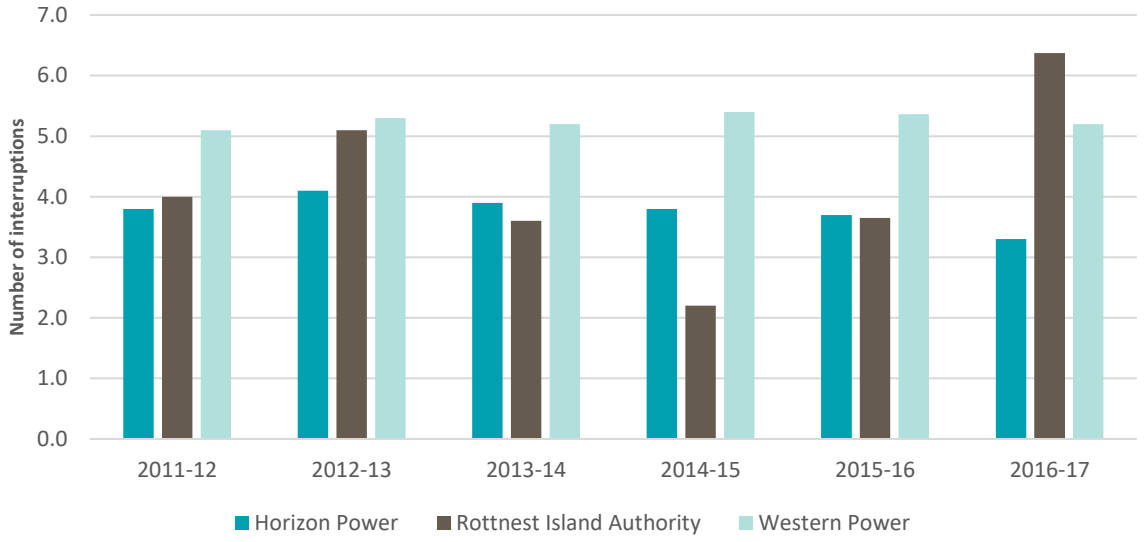
Over the past six years, the Rottnest Island Authority was the only distributor to meet the NQ&R Code's 290-minute standard for rural areas. However, in 2016-17, the average length of interruptions on its system was 386 minutes, up from 136 minutes in 2015-16. The Rottnest Island Authority attributed the increase to several incidents, including planned outages on its distribution system to connect a new solar power system and replace emergency generators, and unplanned outages caused by an underground cable failure.

The average length of interruptions on Horizon Power's systems was 5.8 per cent lower than the previous year (338 minutes, down from 359 minutes in 2015-16). The average length of interruptions on Western Power's system was slightly higher compared to last year, with an increase of 0.5 per cent (997 minutes, up from 992 minutes in 2015-16).

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

The performance of the Horizon Power and Western Power systems in 2016-17 was similar to that in 2015-16. The average frequency of interruptions on the Rottnest Island Authority system was 73 per cent higher (at 6.4 per connection) in 2016-17. The Rottnest Island Authority explained that the increased interruptions were due to the same reasons given for the increase in the average total length of interruptions.

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 2016-17. 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	233	N/A	2.4	209	846
Rottnest Island Authority	1077	N/A	N/A	1077	N/A
Western Power	343	23	232	410	1062
	Normalised Average Interruption Duration (minutes per annum)				
	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	125	N/A	0.0	107	572
Rottnest Island Authority	0	N/A	N/A	0	N/A
Western Power	165	14	104	176	626

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[33]) results in the values of normalised SAIDI being lower than the

[33] Examples of system interruptions excluded from the SAIDI calculation under the normalisation process include interruptions caused by events outside the control of the distributor, such as weather events.

overall SAIDI. In the case of the Rottnest Island Authority distribution system, the normalisation process has excluded all of the interruptions.[34]

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 2015-16 and 2016-17.

Table 9: Comparison of normalised SAIDI for each electricity distributor

	2015-16					2016-17				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	199	N/A	32	199	764	125	N/A	0	107	572
Rottnest Island Authority	0	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A
Western Power	152	23	91	168	583	165	14	104	176	626

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

In 2016-17, the normalised SAIDI increased slightly for three of the four classes of feeder on the Western Power distribution system. This resulted in the Total Network SAIDI increasing by 8.6 per cent compared to 2015-16.

The normalised SAIDI for Horizon Power's short rural and long rural feeders improved in 2016-17, down by 46.2 per cent and 25.1 per cent respectively from 2015-16. This resulted in a 37.2 per cent decrease in Total Network SAIDI.[35]

System Average Interruption Frequency Index (SAIFI)

Table 10 shows the overall and normalised SAIFI values by feeder class for each distributor in 2016-17. SAIFI measures how often the average customer has a supply interruption. 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.

Table 10: Overall and normalised SAIFI for each electricity distributor

	Overall Distribution network – System Average Interruption Frequency (per annum)				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	2.6	N/A	0.0	2.3	8.3
Rottnest Island Authority	15.9	N/A	N/A	15.9	N/A
Western Power	2.3	0.1	1.7	2.8	5.6
	Normalised Distribution network – System Average Interruption Frequency (per annum)				
	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	2.1	N/A	0.0	1.9	7.0

[34] The interruptions were caused by generation outages and a single underground cable failure. The outage for the cable failure was excluded because it exceeded the Major Event Day threshold (see Appendix 4 for the definition of Major Event Days).

[35] Horizon Power attributed the higher SAIDI in 2015-16 to the Esperance bushfires that occurred in November 2015.

Rottnest Island Authority	0.0	N/A	N/A	0.0	N/A
Western Power	1.4	0.1	1.0	1.8	4.0

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

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 11 shows each distributor's normalised SAIFI by feeder class in 2015-16 and 2016-17.

Table 11: Comparison of normalised SAIFI for each electricity distributor

	2015-16					2016-17				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	3.1	N/A	0.9	3.2	7.8	2.1	N/A	0.0	1.9	7.0
Rottnest Island Authority	0.0	N/A	N/A	0.0	N/A	0.0	N/A	N/A	0.00	N/A
Western Power	1.4	0.1	0.9	1.8	4.0	1.4	0.1	1.0	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 2015-16 and 2016-17 mostly follows the same pattern as that for the SAIDI values. This result is to be expected. When an interruption is removed from the total interruptions by the SAIDI normalisation process, there is a corresponding reduction in the value of SAIFI.

Customer Average Interruption Duration Index (CAIDI)

Table 12 shows the overall and normalised CAIDI values by feeder class for each distributor in 2016-17.

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

Table 12: Overall and normalised CAIDI for each electricity distributor

	Overall Distribution Network – Customer Average Interruption Duration (minutes per annum)				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	91	N/A	184	89	102
Rottnest Island Authority	68	N/A	N/A	68	N/A
Western Power	151	167	137	149	191
	Normalised Distribution Network – Customer Average Interruption Duration (minutes per annum)				
	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	59	N/A	0	56	81
Rottnest Island Authority	0	N/A	N/A	0	N/A
Western Power	115	123	102	100	159

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

Table 13 shows each distributor's normalised CAIDI by feeder class in 2015-16 and 2016-17.

Table 13: Comparison of normalised CAIDI for each electricity distributor

	2015-16					2016-17				
Distributor	Total Network	CBD	Urban	Short Rural	Long Rural	Total Network	CBD	Urban	Short Rural	Long Rural
Horizon Power	65	N/A	36	62	98	59	N/A	0	56	81
Rottnest Island Authority	0	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A
Western Power	111	217	101	96	146	115	123	102	100	159

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

Comparing 2015-16 with 2016-17 shows that the normalised Total Network CAIDI on Horizon Power's systems fell by 9.2 per cent and increased by 3.6 per cent on Western Power's system.

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

On Western Power's system, customers in the CBD had the largest decrease in average interruption duration, down by 43.3 per cent between 2015-16 and 2016-17. The largest increase in average interruption duration was for customers on long rural feeders, with an increase of 8.9 per cent compared to 2015-16.

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

Multiple interruptions on gas distribution systems

No distributor reported customer premises having five or more unplanned interruptions in 2016-17.

Customers experiencing five or more interruptions in a year is rare. Over the past six years, ATCO was the only distributor to report customers experiencing five or more interruptions in the year, with a single customer affected by an interruption in each of the three years prior to 2016-17.[36]

Extended interruptions

In 2016-17, 439 customer premises on ATCO's system were interrupted for more than 12 hours continuously. The interruptions were caused by water ingress and broken service equipment. This is a decrease of 17.5 per cent compared to 2015-16.

Fourteen customer premises on Kleenheat's systems were interrupted for more than 12 hours continuously, caused by commissioning works. This is the first year that Kleenheat has reported customers experiencing extended interruptions.[37]

[36] A different customer was affected by multiple interruptions in each or the three years.

[37] 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 2015-16 and 2016-17.

Total residential and business gas consumption increased in 2016-17, because of increased consumption on the ATCO systems. Esperance Power Station reported a slight increase in residential gas consumption and a 36.4 per cent decrease in business gas consumption. Esperance Power Station attributed the decrease in business gas consumption to dry weather conditions during the harvesting season resulting in grain dryers in Esperance processing less product than usual.

Kleenheat reported a 16.1 per cent increase in residential gas consumption in 2016-17. The increase was attributed by Kleenheat to new connections and cold weather increasing gas usage.

In 2016-17, Kleenheat reported zero business gas consumption by small use customers for the first time. Kleenheat explained that in previous years it reported business gas consumption in error, due to some residential accounts being set up in business names (residential homes owned by businesses, such as charities).

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

	Residential			Business		
Distributor	**2015-16**	**2016-17**	**Change (%)**	**2015-16**	**2016-17**	**Change (%)**
ATCO[38]	10,049,915	11,036,506	9.8	1,319,166	1,383,781	4.9
Esperance Power Station	4,014	4,017	0.0	32,342	20,570	-36.4
Kleenheat	7,348	8,531	16.1	218	0	-100.0
State Total	**10,061,277**	**11,049,054**	**9.8**	**1,351,726**	**1,404,351**	**3.9**

Residential and business gas consumption over the past six years is in Table 58 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.

[38] ATCO's gas consumption data is based on calendar year from January to December. The consumption data for the 2016-17 period is in fact that for the 2016 calendar year.

Table 15: Unaccounted for gas (GJ)

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO[39]	920,371	813,898	707,191	705,987	715,966	744,053
Esperance Power Station	0	0	0	0	0	425
Kleenheat	1,158	866	943	529	562	512
State Total	**921,529**	**814,764**	**708,134**	**706,516**	**716,528**	**744,990**

Esperance Power Station reported UFG for the first time in 2016-17 (425 gigajoules).[40] It attributed this to implementing an improved system for identifying UFG.

The level of UFG on the ATCO system was slightly higher than in 2015-16, with a 3.9 per cent increase in 2016-17. Kleenheat reported a decrease in UFG of 8.9 per cent in 2016-17, which is a six-year low.

Comparing Table 15 with Table 14 shows that in 2016-17, UFG accounted for six per cent of the gas entering Kleenheat's systems.

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

[39] ATCO's UFG data is based on calendar year from January to December. The UFG for the 2016-17 period is in fact that for the 2016 calendar year.

[40] In the previous six years, Esperance Power Station reported zero UFG. The explanation provided at the time was that the distribution network is relatively new, and 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 main leak repairs

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	830	835	842	575	781	943
Esperance Power Station	0	2	0	0	2	1
Kleenheat	0	1	1	25	41	11
State Total	**830**	**838**	**843**	**600**	**824**	**955**

ATCO performed most of the gas mains repairs, which reflects the size of its distribution system in comparison to the other two distributors.[41]

Compared to 2015-16, ATCO reported a 20.7 per cent increase in gas main leak repairs in 2016-17. Kleenheat and Esperance Power Station reported decreases in the number of gas mains leak repairs on their distribution systems, down from 41 to 11 repairs and from two to one repair respectively.

ATCO attributed the increase in leak repairs on its gas mains to an increase in the frequency of leak surveys (inspections) that must be carried out.

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

Table 17: Gas property service connection leak repairs

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	5,657	6,614	7,182	5,575	6,040	5,815
Esperance Power Station	0	3	0	1	0	1
Kleenheat	0	0	0	42	5	25
Total	**5,657**	**6,617**	**7,182**	**5,618**	**6,045**	**5,841**

Compared to 2015-16, ATCO reported a 3.7 per cent decrease in the number of property service connection leak repairs in 2016-17. Kleenheat and Esperance Power Station reported increases in the number of property service connection leak repairs, up from 5 to 25 repairs and from zero to one repair respectively.

On the increase in its property service connection leak repairs, Kleenheat commented that it carried out more leak surveys in 2016-17 (and 2014-15, when 42 leak repairs were reported) than in 2014-15. Kleenheat explained that its leak surveys were spread over three years, from 2014 to 2017. The annual fluctuation in the number of leak repairs is due to variances in the number of leak surveys it performs each year, which in turn depends on the location of each system being surveyed.

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

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

Table 18: Gas meter leak repairs

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	816	486	471	3,527	3,209	3,415
Esperance Power Station	0	0	0	0	2	3
Kleenheat	1	0	2	0	44	1
Total	**817**	**486**	**473**	**3,527**	**3,255**	**3,419**

Kleenheat reported a large decrease in meter leak repairs in 2016-17, down from 44 repairs in 2015-16 to one repair in 2016-17. Esperance Power Station reported a small increase in meter leak repairs from two to three repairs.

Gas meter leak repairs on the ATCO system were 6.4 per cent higher in 2016-17 than in 2015-16. There was a large increase in the number of meter leak repairs after 2013-14 due to improvements in ATCO's ability to identify meter leaks.

Streetlight repairs

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

The total number of streetlights in metropolitan areas increased by 1.6 per cent in 2016-17. The number of metropolitan streetlights maintained by Horizon Power decreased by 3.2 per cent and the number maintained by Western Power increased by 1.8 per cent.

Horizon attributed the decrease in the number of its metropolitan streetlights to the decommissioning of old streetlights as part of the project to move its distribution lines underground. During this process its old streetlights are replaced with new streetlights connected to the underground distribution system, but there can be a period of time when both old and new streetlights are connected to its distribution system (the old streetlights are not decommissioned until after the new streetlights are installed). This means there can be an increase in the number of streetlights when the new streetlights are installed, and then a reduction in the number of streetlights later when the old streetlights are decommissioned, which can occur in the following reporting year.

The total number of streetlights in regional areas increased by 0.6 per cent in 2016-17. Horizon Power and Western Power reported increases in the number of streetlights of 1.5 per cent and 0.4 per cent respectively.

Table 19: Number of streetlights in metropolitan and regional areas

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Metropolitan areas						
Horizon Power	5,441	5,993	8,325	8,022	8,332	8,066
Western Power	198,070	199,767	207,146	213,526	219,734	223,721
Total	**203,511**	**205,760**	**215,471**	**221,548**	**228,066**	**231,787**
Regional areas						
Horizon Power	9,978	10,331	11,298	11,007	11,092	11,255
Rottnest Island Authority	190	190	190	189	189	189
Western Power	37,595	37,907	38,539	39,202	39,769	39,931
Total	**47,763**	**48,428**	**50,027**	**50,398**	**51,050**	**51,375**

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

The total number of metropolitan streetlight faults logged by each distributor increased by 16.8 per cent in 2016-17, after reaching a six-year low in 2015-16. The total number of faults logged had been on a downward trend since 2012-13, mirroring the faults logged by Western Power.

Western Power attributed the increase to changes to its website making it easier to report faults online, and an increase in the number of streetlight poles being reinforced rather than replaced. Reinforcement extends the life of the pole, but not the lamp in the streetlight. While there has been an increase in the total number of metropolitan streetlight faults logged by Western Power in 2016-17, it is lower than three of the previous five years.

The total number of regional streetlight faults decreased by 57.9 per cent in 2016-17, reaching a six-year low. The decrease mirrors the 61.9 per cent decrease in faults logged by Western Power. Western Power attributed the decrease to the responsibility for repairing regional streetlights reverting back to Western Power from contractors in 2016-17.

Contractors would look for and report faults, whereas Western Power's internal work crews are required to prioritise their work and only attend to streetlight faults when a report is received from a member of the public.

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

Metropolitan	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Metropolitan areas						
Horizon Power	180	108	149	158	130	163
Western Power	34,271	36,525	33,447	28,647	28,388	33,145
Total	**34,451**	**36,633**	**33,596**	**28,805**	**28,518**	**33,308**
Regional areas						
Horizon Power	168	166	168	177	183	248
Rottnest Island Authority	18	46	18	112	79	22
Western Power	3,137	3,414	3,220	3,428[42]	4,061	1,549
Total	**3,323**	**3,626**	**3,406**	**3,717**	**4,323**	**1,819**

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

Figure 9: Percentage of faulty streetlights by distributor and location

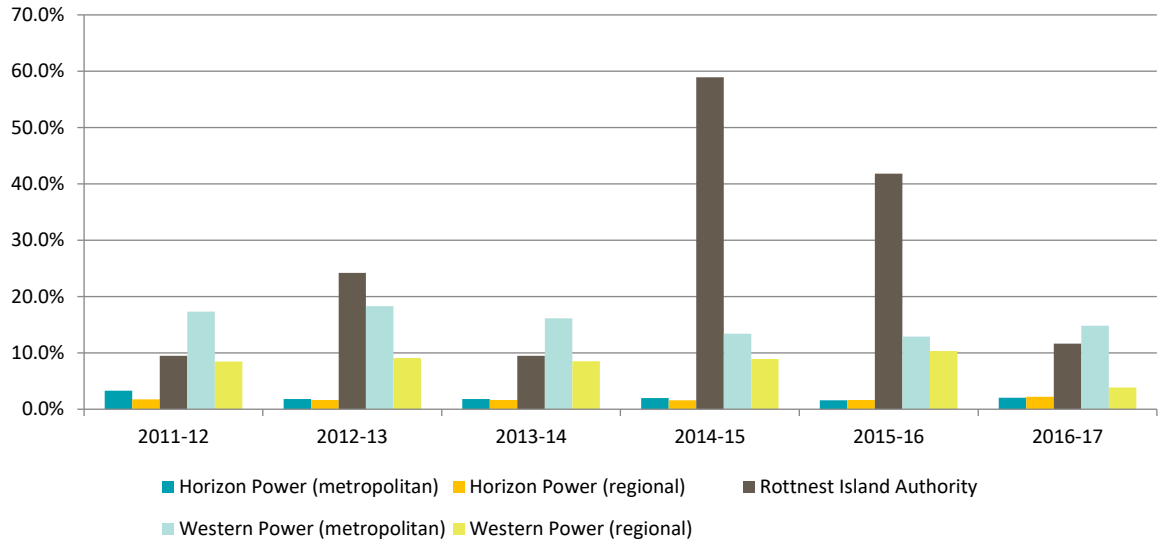


Figure 10 shows the proportion of faulty metropolitan streetlights that were repaired more than five business days after they were reported faulty.

In 2016-17, the proportion of faulty metropolitan streetlights repaired after five days by Horizon Power decreased from 16.3 per cent to 15.3 per cent and for Western Power it increased from 1.5 per cent to 6.6 per cent.

Western Power commented that the deterioration in performance was mainly due to a reduction in the number of contractor work crews engaged by Western Power for metropolitan streetlight repairs. However, Western Power also reported that its average

[42] This was reported incorrectly as 3,717 in the 2016 Distributors Report.

response time for repairing a faulty metropolitan streetlight was 3.45 days against the five day target.

Figure 10: Percentage of faulty metropolitan streetlights repaired after 5 business days

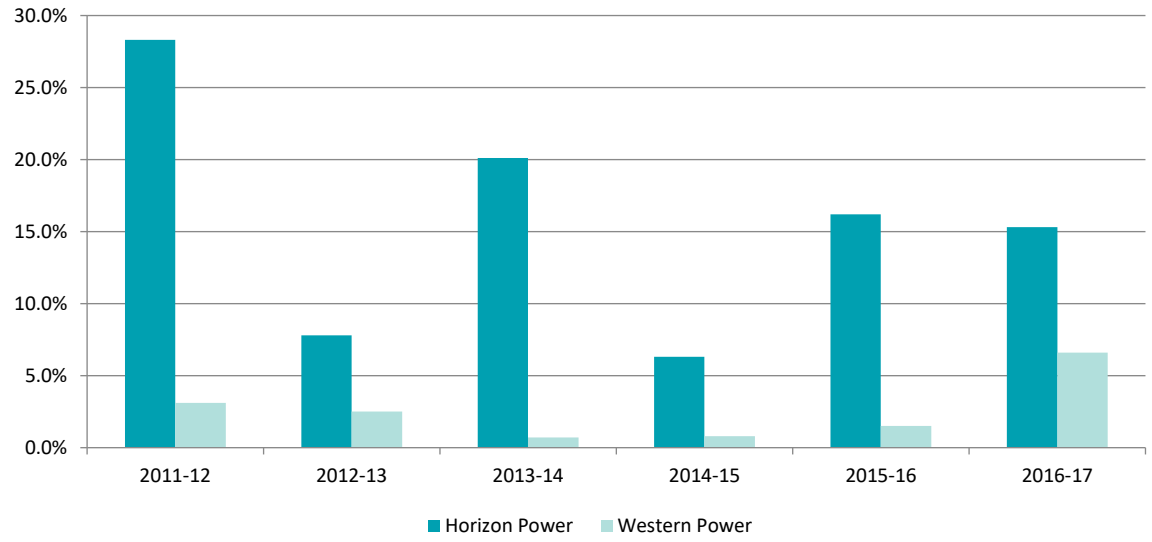
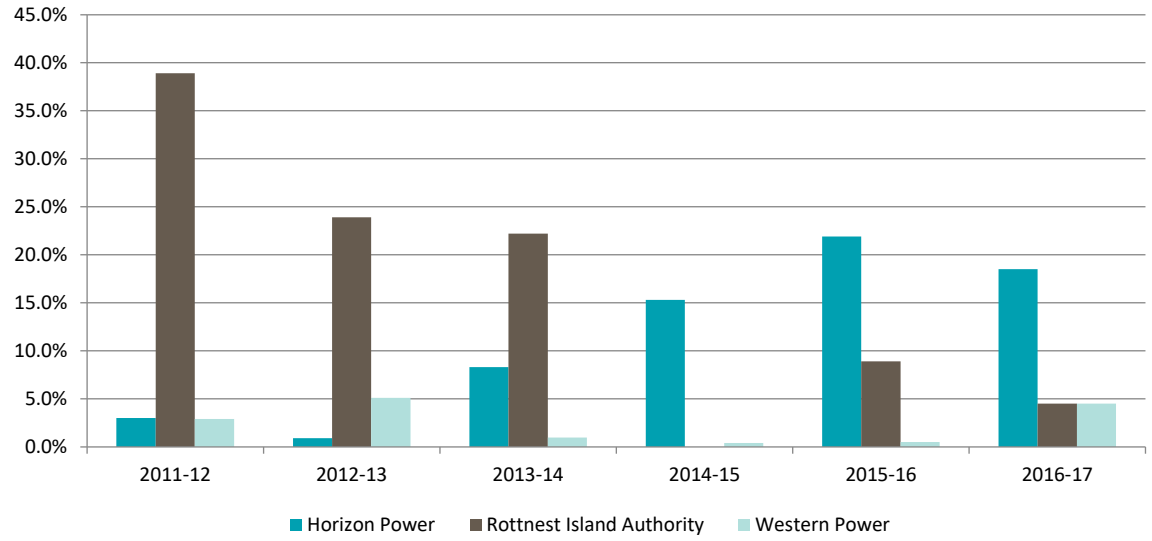


Figure 11 shows the percentage of faulty regional streetlights that were repaired more than nine business days after they were reported faulty.

Figure 11: Percentage of faulty regional streetlights repaired after 9 days



The percentage of faulty regional streetlights repaired after nine days by Horizon Power decreased from 21.9 per cent to 18.5 per cent. The 21.9 per cent in 2015-16 was a six-year high at the time.

The percentage of faulty regional streetlights repaired after nine days by Western Power increased from 0.5 per cent to 4.5 per cent. Western Power attributed the increase to the move to utilise internal work crews instead of contractors for regional streetlight repairs. The internal crews have to respond to other incidents, such as storms, bushfires and other emergency work. These incidents have, on occasion, taken priority over streetlight repairs, which has resulted in more late repairs. Western Power noted that its average response time for repairing regional streetlights was 5.6 days against a target of nine days.

While Horizon Power reported an improvement in its performance, it still reported a considerably higher percentage of streetlights repaired outside the five and nine day timeframes than Western Power. In 2015-16, Horizon Power reported that it made 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.

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 or about an organisation, related to its products, services, staff or the handling of a complaint, where a response or resolution is explicitly or implicitly expected or legally required.

When deciding whether a customer contact should be recorded as a complaint, distributors are encouraged to consider the ERA's *Customer Complaints Guidelines,* which has information to help distinguish between queries, complaints and other customer communications.

A measure of the effectiveness of a distributor's complaints handling process is how quickly a complaint is concluded.[43] Distributors report on the percentage of complaints that are concluded within 15 business days.

Electricity complaints

The electricity code, NQ&R Code and the SCONRRR framework all include complaint recording and reporting obligations.

The electricity code requires distributors to report complaints information specified by the ERA.[44] The ERA has specified two categories of complaints:

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

The NQ&R Code focusses on the number of complaints received by a distributor that it has failed to comply with the NQ&R Code's power quality and reliability standards.

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.

[43] 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.

[44] The specification of complaints reporting obligations is in the *Electricity Distribution Licence Performance Reporting Handbook* and the *Gas Distribution Licence Performance Reporting Handbook*.

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 2016-17. QoS complaints received over the past six years is in Appendix 3, Table 53.[45]

In 2016-17, the majority of the complaints received by both distributors were categorised as "other" (technical matters which do not fall into the more specific complaint categories).

Table 21: Technical quality of service complaints received in 2016-17 by category

	Horizon Power	Western Power
Total number of technical QoS complaints	111	2,245
Complaint categories		
Low supply voltage complaints	15	156
Voltage dip complaints	0	18
Voltage swell complaints	0	20
Voltage spike complaints	0	6
Waveform distortion complaints	0	0
TV or radio interference complaints	2	80
Noise from appliances complaints	0	0
Other complaints	94	1,965

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

Compared to 2015-16, Western Power and Horizon Power received 24.5 per cent and 226.5 per cent more QoS complaints respectively in 2016-17.

Western Power attributed the increase in complaints to high voltage faults reported by customers with inverters (for solar power systems). The increase in high voltage complaints (categorised under "other" in Table 21) was the result of Australian Standard *AS/NZS 4777.2* being made mandatory on 9 October 2016 for new inverters connected to the low voltage network. Customers affected by the new Australian Standard were advised by

[45] The Rottnest Island Authority has received only one QoS complaint in the past six years.

Western Power to report any voltage issues. Consequently, in the months following the introduction of the Australian Standard, Western Power received more fault reports from these customers.

Horizon Power reported that, of the 111 QoS complaints it received, 41 were complaints raised by customers. The remaining 70 complaints were power quality matters reported by its AMI meters and recorded as QoS complaints. Horizon Power rectified this discrepancy when it discovered that its compliance system was recording power quality problems reported by its AMI meters as complaints. If the 70 power quality reports from the AMI meters are excluded from the data, Horizon Power recorded a 20.6 per cent increase in QoS complaints, rather than a 226.5 per cent increase.

Table 22: Technical quality of service complaints received since 2011-12

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Horizon Power	23	30	31	32	34	111
Rottnest Island Authority	0	0	0	0	0	0
Western Power	1,307	1,311	2,017	1,746[46]	1,803	2,245
State Total	**1,330**	**1,341**	**2,048**	**1,921**	**1,837**	**2,356**

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 53.2 per cent of the complaints. Where a cause could be identified, 28.8 per cent of complaints were caused by network equipment faults and 8.1 per cent by environmental issues.

Western Power was unable to identify the cause for 38.8 per cent of the complaints it received. Where a cause could be identified, 37.3 per cent were caused by network limitations, 10.2 per cent by customer internal problems, 6.7 per cent by faulty network equipment and 5.6 per cent by other issues.

Table 23: Likely cause of technical quality of service complaints in 2016-17

Likely cause of technical QoS complaints	Horizon Power	Western Power
Network equipment faulty	32	150
Network interference by network service provider equipment	0	4
Network interference by another customer	0	2
Network limitation	0	837
Customer internal problem	0	230
No problem identified	59	870
Environmental	9	27
Other	11	125

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

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.

Horizon Power received 56.8 per cent fewer electricity code complaints in 2016-17. Complaints about administrative and customer service issues decreased by 48 per cent, and other complaints decreased by 93.4 per cent.[47] Horizon Power attributed the decrease in complaints to the installation of AMI meters.

Western Power received 40.8 per cent more electricity code complaints in 2016-17. Administrative and customer service complaints increased by 84.3 per cent and other complaints increased by 28.6 per cent. Western Power attributed the increase in complaints to several reasons, including the time taken to repair streetlights, complaints from customers not wanting to provide access to their property for Western Power to replace or read a meter, and an increase in customer disconnections requested by retailers.

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

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Horizon Power[48]						
Administrative and customer service complaints	86	414	274	168	506	263
Other complaints	51	55	17	76	121	8
Total complaints	**137**	**469**	**291**	**244**	**627**	**271**
Western Power						
Administrative and customer service complaints	33	25	41	68	140	258
Other complaints	679	639	506	592	500	643
Total complaints	**712**	**664**	**547**	**660**	**640**	**901**

Electricity complaint resolution

Figure 12 shows the percentage of complaints resolved within 15 business days by Horizon Power and Western Power about electricity code and NQ&R Code matters.[49]

In 2016-17, Western Power resolved 93.3 per cent of complaints within 15 days, which is a six-year high.

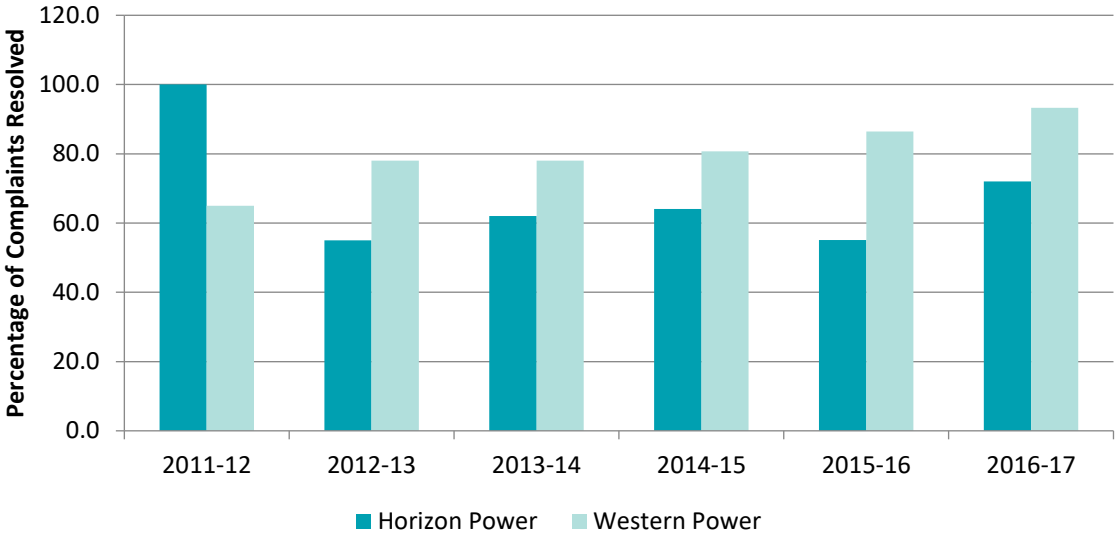
Horizon Power resolved 72 per cent of complaints within 15 days in 2016-17, up from 55.1 per cent in 2015-16, which is a five-year high. Horizon Power attributed the improvement in complaint resolution performance to the data from its AMI meters improving Horizon Power's ability to identify the root cause of the complaints and resolve complaints more quickly. The improvement in performance also coincides with a reduction in the number of complaints Horizon Power received in 2016-17; also attributed to the installation of AMI meters.

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

[48] 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.

[49] Table 53 contains data on the number of NQ&R Code complaints received by distributors.

Figure 12: Electricity distributor complaints resolved within 15 business days (electricity code and NQ&R code)



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 in 2016-17 increased by 0.6 per cent from 2015-16. In 2015-16, ATCO reported a 117.4 per cent increase in complaints from the previous year, following changes to its complaint definition and complaints handling procedure.[50]

[50] 2015-16 was the first full year that ATCO recorded complaints in accordance with its new complaint definition and procedure to capture complaints that are resolved at first contact. ATCO implemented the system changes in January 2015, which meant the 2014-15 complaints data only covered a part year.

Table 25: Complaints received by gas distributors

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	36	25	25	236	513	516
Esperance Power Station	0	0	0	0	0	0
Kleenheat	2	0	0	3	1	4
State Total	**38**	**25**	**25**	**239**	**514**	**520**

Table 26 categorises the complaints received by ATCO and Kleenheat in 2016-17.

The majority of the complaints received by ATCO cover administrative and customer service (31.6 per cent) and other (51.2 per cent). The complaint category of "other" covers matters such as poor service, privacy issues, and health and safety issues.

Table 26: Categorisation of complaints received by gas distributors in 2016-17

Complaint Category	ATCO	Kleenheat
Complaint category		
Connection and Augmentation	49	2
Reliability of Supply	26	2
Quality of Supply	4	0
Network Charges and Costs	10	0
Administrative Processes or Customer Service	163	0
Other	264	0
Total	**516**	**4**

Call centre performance

A substantial amount 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 primary 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[51] 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 the 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 3.8 per cent lower in 2016-17, and a six-year low.

Horizon Power was the only distributor to receive more calls in 2016-17. Call volume was up by 6.7 per cent compared to 2015-16. Horizon Power attributed the increase in call volume to the installation of its AMI meters, which enable it to remotely disconnect and reconnect a customer. This has increased the number of disconnections, as previously it was too expensive to visit some properties to manually disconnect them (for example, when a customer vacates a premises in a remote area). The increase in disconnections correlates with the increase in calls to the call centre.

[51] 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.

The call centres of the Rottnest Island Authority and Western Power both received fewer calls in 2016-17, down by 58.4 per cent and 3.9 per cent respectively. For both distributors, this is a six-year low.

The Rottnest Island Authority attributed the substantial reduction in calls to a number of initiatives to improve its service, including 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.

Table 27: Volume of calls to electricity distributor call centres

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Horizon Power	82,587	103,301	14437	11,452	12,794	13,645
Rottnest Island Authority	5,840	6,173	4,850	5,250	1,955	814
Western Power	531,554	510,935	455,368	388,358	357,105	343,300
State Total	**619,981**	**620,409**	**474,655**	**405,060**	**371,854**	**357,759**

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 the percentage of calls that were answered within 30 seconds, the average waiting time before the call was answered by the call centre and the percentage of calls that were unanswered.

Horizon Power, Western Power and the Rottnest Island Authority all reported an improvement in the percentage of calls answered within 30 seconds in 2016-17. Horizon Power, Western Power and the Rottnest Island Authority's performance improved by 1.5 per cent, 1.6 per cent and 3.7 per cent respectively.

Horizon Power also reported an improvement in the average duration before a call was answered, down from 32 seconds in 2015-16 to 26 seconds in 2016-17. Western Power reported a small deterioration in performance, with its average duration before a call was answered down from 15 seconds in 2015-16 to 17 seconds in 2016-17. The Rottnest Island Authority's performance remained unchanged at 12 seconds.

Horizon Power and Western Power both reported an improvement in the percentage of calls that went unanswered. Horizon Power's percentage decreased from 13.7 per cent in 2015-16 to 5.6 per cent in 2016-17. Western Power's percentage decreased from 5.8 per cent to 4.5 per cent.

Horizon Power attributed its improved performance against all three call centre measures to a new fault call diagnosis tool implemented with its AMI meter project. The tool allows Horizon Power to locate where the fault is (on the network or behind the meter on the customer's side) and it provides immediate customer information to assist the operator in resolving complaints from callers.

The Rottnest Island Authority reported a deterioration in performance, with the percentage of unanswered calls increasing from 3.6 per cent to 10 per cent. This is despite the volume of calls received decreasing by 58.4 per cent. It reported that of the 81 calls that were not answered in 2016-17, 50 calls (61.7 per cent) were abandoned by callers after five seconds, resulting in the deterioration in performance.

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

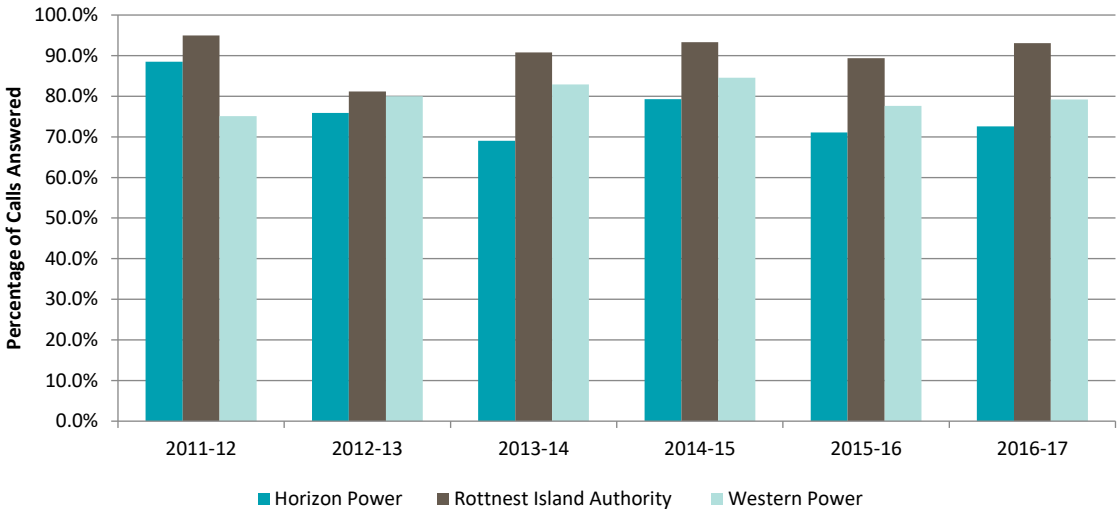


Figure 14: Average duration before a call was answered by electricity distributors

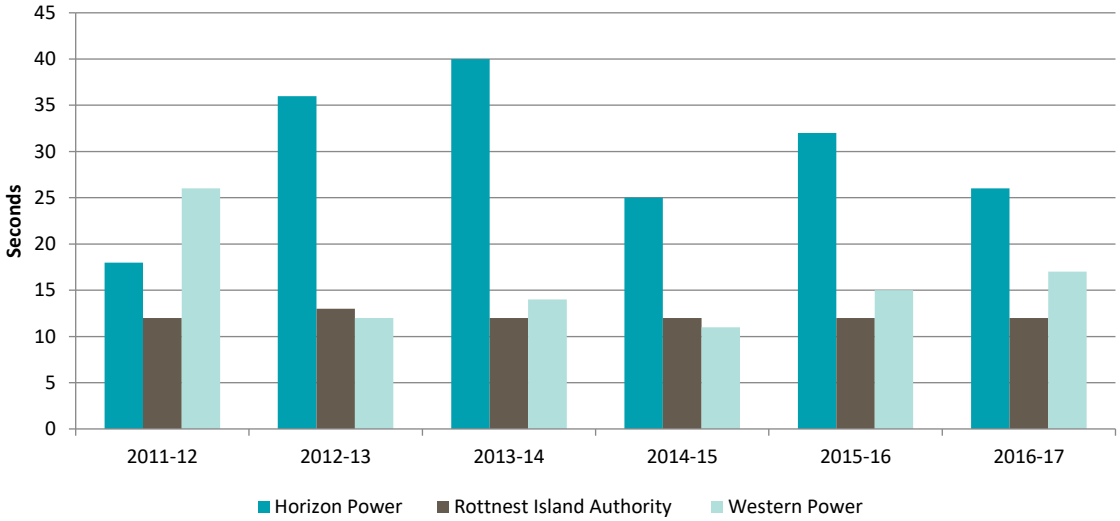
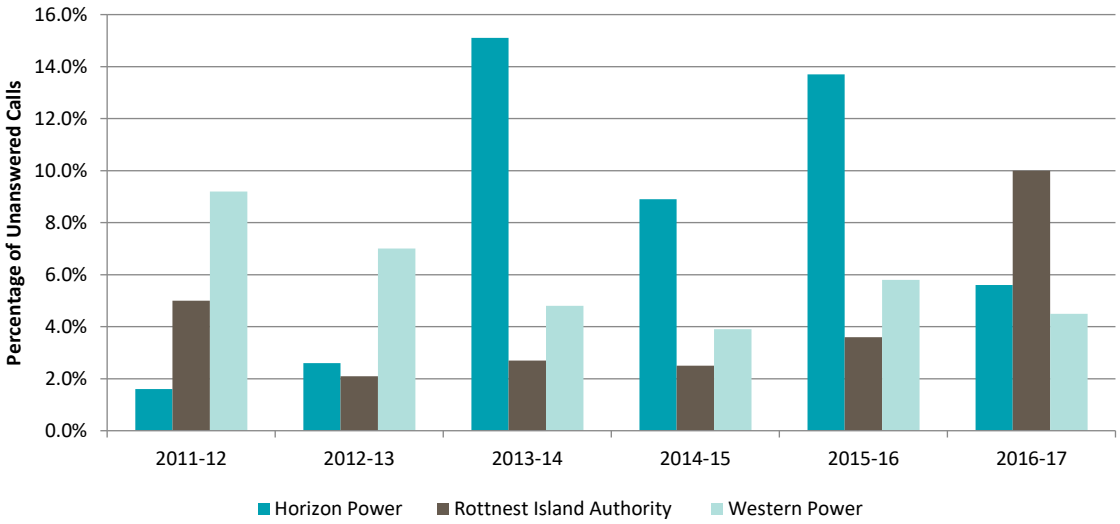


Figure 15: Percentage of calls that were unanswered by electricity distributors



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 28 shows the volume of calls received by the ATCO and Kleenheat call centres. The total volume of calls received by distributor call centres increased by 18.9 per cent in 2016-17. This is solely due to a 28.5 per cent increase in calls received by Kleenheat, which attributed the increase to customer growth in the residential natural gas market.[52] ATCO reported a 6.3 per cent decrease in the number of calls received by its call centre.

Table 28: Volume of calls to gas distributor call centres

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	65,098	66,933	77,388	84,106	84,685	79,316
Kleenheat	214,280	220,710	235,698	233,363	222,505	285,887
State Total	**279,378**	**287,643**	**313,086**	**317,469**	**307,190**	**365,203**

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

The performance of both distributors' call centres against all three measures in 2016-17 was broadly similar to previous years, with the exception of the measure for the average duration before a call was answered. For ATCO's call centre, the average duration before a call was answered was down from 33 seconds to 21 seconds, a six-year low; and for Kleenheat's call centre, it was up from 25 seconds to 32 seconds, a six-year high. Kleenheat attributed the increase to a rapid growth in its customer base resulting in more calls, while ATCO attributed its improved call centre performance to receiving fewer calls in 2016-17.

[52] The majority of these calls relate to Kleenheat's retail business.

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

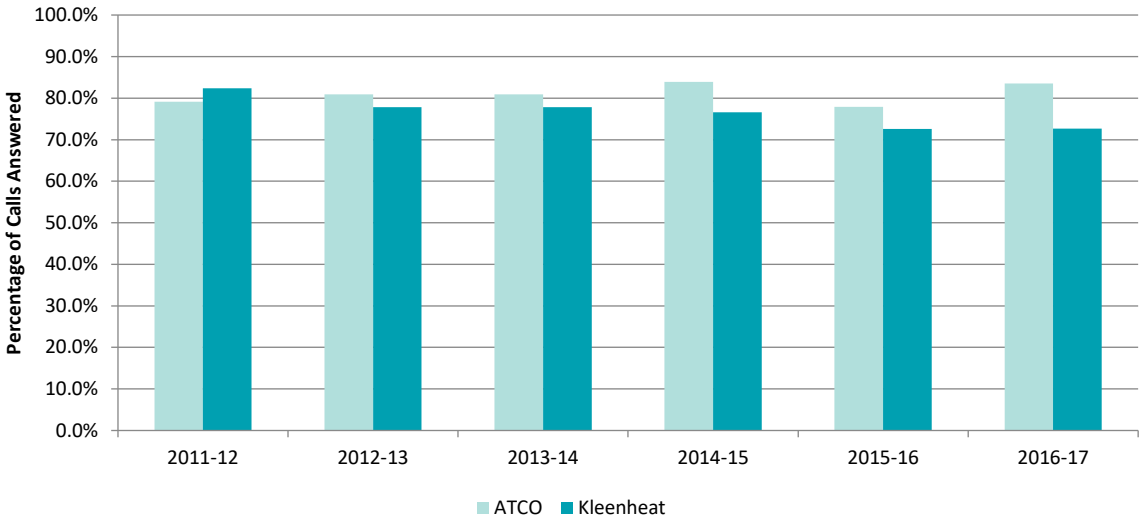


Figure 17: Average duration before a call was answered by gas distributors

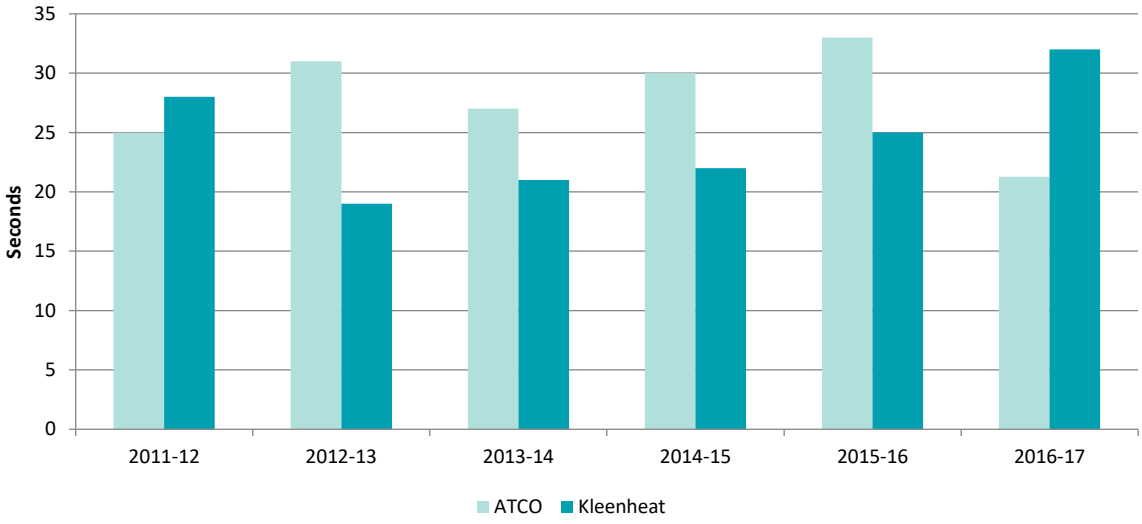
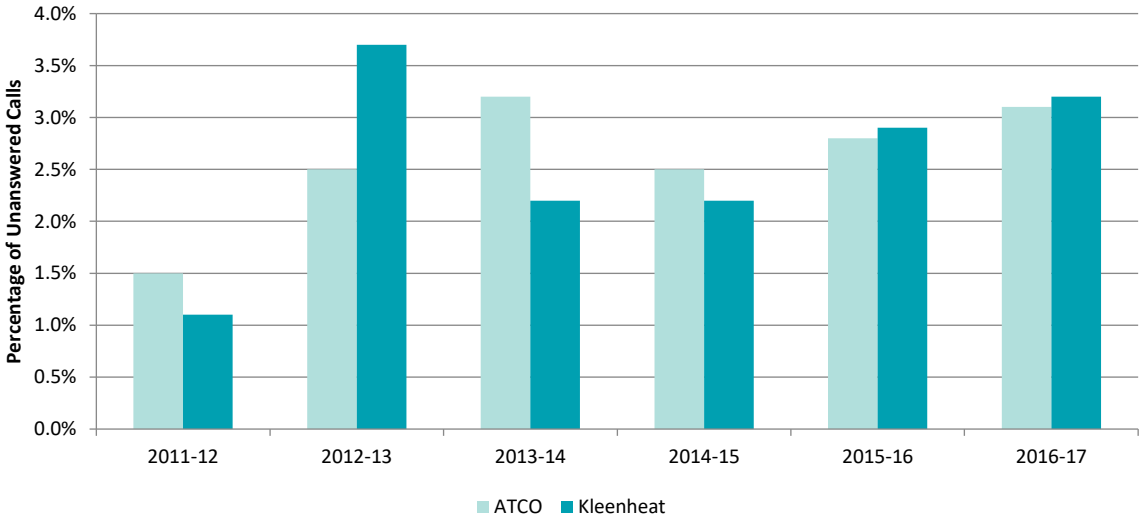


Figure 18: Percentage of calls that were unanswered by gas distributors



Service standard payments

Electricity distributor service standard payments

The electricity code requires distributors to make service standard payments to customers for:[53]

- wrongful disconnection, at a rate of $100 per day;[54] and
- failure to acknowledge or respond to a customer complaint within the prescribed timeframes at a rate of $20 for each written complaint.[55]

The NQ&R Code requires distributors to make service standard payments to customers for:[56]

- failure to give at least 72 hours' notice of a planned supply interruption;[57] and
- supply interruptions that exceed 12 hours in duration.[58]

The Rottnest Island Authority has not made any service standard payments to customers over the past six years. Accordingly, Table 29 only provides information about payments made by Horizon Power and Western Power.

Table 29: Service standard payments made by electricity distributors

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Electricity Code - clause 14.4 (failure to acknowledge or respond to a complaint on time)						
Horizon Power	0	0	0	0	0	0
Western Power	4	0	0	1	0	0
Electricity Code - clause 14.5 (wrongful disconnection)						
Horizon Power	-	-	4	2	2	61
Western Power	-	-	14	1	4	5
NQ&R Code – clause 18 (failure to give at least 72 hours' notice of a planned interruption)						
Horizon Power	9	1	10	1	6	1
Western Power	968	683	751	341	408	601
NQ&R Code – clause 19 (supply interruptions exceeding 12 hours in duration)						
Horizon Power	32	34	89	1,618[59]	17	346
Western Power	28,800	47,523	15,166	7,509	9,518	13,289

Horizon Power and Western Power did not make any payments under clause 14.4 of the electricity code (failure to respond to a complaint), which is consistent with previous years. However, the number of payments made by Horizon Power under clause 14.5 of the

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

[54] Clause 14.5 of the electricity code.

[55] Clause 14.4 of the electricity code.

[56] The distributor is only required to make payments if the customer applies. Also, eligibility for payments is limited to customers who consume less than 50 megawatt hours of electricity per year.

[57] Clause 18 of the NQ&R Code.

[58] Clause 19 of the NQ&R Code.

[59] The peak in payments in 2014-15 was caused by tropical cyclones Olwyn and Quang.

electricity code (wrongful disconnection) increased from two payments in 2015-16 to 61 payments in 2016-17. Horizon Power attributed the increase in payments to a system error that wrongfully disconnected 59 pre-payment meter customers.

The number of payments made by Horizon Power under section 19 of the NQ&R Code (interruptions greater than 12 hours) increased from 17 payments in 2015-16 to 346 payments in 2016-17. Horizon Power attributed the substantial increase in payments to three outages greater than 12 hours in Fitzroy Crossing (fire), Yungngora (flooding) and Karratha (blown ring main unit).

Western Power made more payments under sections 18 and 19 of the NQ&R Code in 2016-17 than in 2015-16. Payments under section 18 were 47.3 per cent higher in 2016-17, while payments under section 19 of the NQ&R Code were 39.6 per cent higher. Western Power explained that the increase in payments was:

> […] predominantly due to storm activity and pole top fires.[60]

Western Power also attributed the increase in payments to the improvements it made to its website to make it easier for customers to apply for payments.

[60] Western Power, *Annual Reliability and Power Quality Report (for the year ended 30 June 2017)*, 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, the Rottnest Island Authority and Western Power as at 30 June 2017.

Table 30: Electricity distribution system assets as at 30 June 2017

Asset Type	Asset Sub-Type/Feeder Class	Horizon Power	Rottnest Island Authority	Western Power
Number of metered supply points	CBD	N/A	N/A	5,520
	Urban	1,501	N/A	770,414
	Short Rural	45,135	190	258,448
	Long Rural	2,112	N/A	96,848
Feeder Length (km)	CBD	N/A	N/A	218
	Urban	146.9	N/A	22,749
	Short Rural	4,422.7	45.3	18,046
	Long Rural	3,311.7	N/A	52,917
Number of Transformers	Sub-transmission	N/A	3	N/A
	Distribution	4,421	16	68,560
Total Capacity of Transformers (MVA)	Sub-transmission	N/A	3	N/A
	Distribution	801	4	10,104
Number of streetlights		19,321	189	263,652
Number of Poles		57,888	56	778,561

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 2017.

The distribution systems operated by Esperance Power Station and Kleenheat are substantially 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 2016-17

		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	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Unprotected Steel	62.3	38.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Protected Steel	0.0	45.1	718.5	0.0	0.0	0.0	0.0	0.0	0.0
	PVC	3,527.0	6,053.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0
	Polyethylene	65.9	3,366.2	243.3	0.0	35.2	0.0	0.0	28.9[61]	0.0
	Other	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total length of distribution mains installed and in service (km)		**3662.2**	**9502.4**	**961.8**	**0.0**	**35.2**	**0.0**	**0.0**	**37.9**	**0.0**
Number of service connections per km of gas mains		52.8			10.9			19.26		

[61] 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	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**		**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	44,328	45,866	46,508	47,832	47,168	48,748	ATCO	652,808	673,878	692,988	714,488	736,746	750,339
Rottnest Island Authority	527	527	527	527	527	528	Esperance Power Station	313	332	342	357	376	383
Western Power	1,015,679	1,050,232	1,060,588	1,085,657	1,110,196	1,128,334	Kleenheat	903	940	956	922	958	1006
State Total	**1,060,534**	**1,096,625**	**1,107,623**	**1,134,016**	**1,157,891**	**1,177,610**	**State Total**	**654,024**	**675,150**	**694,286**	**715,767**	**738,080**	**751,728**

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

	New connections on electricity systems							New connections on gas systems					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**		**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	1,780	2,401	2,797	1,576	860	549	ATCO	14,752	15,423	20,273	23,734	24,600	16,814
Rottnest Island Authority	0	0	0	0	0	1	Esperance Power Station	20	3	8	12	18	9
Western Power	21,420	23,994	29,532	33,925	32,589	25,029	Kleenheat	41	37	15	43	34	48
State Total	**23,200**	**26,395**	**32,329**	**35,501**	**33,449**	**25,579**	**State Total**	**14,813**	**15,463**	**20,296**	**23,789**	**24,642**	**16,871**

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

	Number of new connections not established on time						Percentage of total new connections					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Electricity												
Horizon Power	2	15	22	16	2	0	0.1	0.6	0.8	1.0	0.2	0.0
RIA	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	0.0
Western Power	446	361	223	189	141	91	2.1	1.5	0.7	0.6	0.4	0.4
Gas												
ATCO	3	2	2	14	287	0	0.02	0.01	0.01	0.1	1.2	0.02
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	8	0	1	0.0	0.0	0.0	18.6	0.0	2.1

Table 35: Customer reconnections on electricity and gas distribution systems

	Reconnections on electricity systems							Reconnections on gas systems					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**		**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	-	1,641	3,502	3,889	1,527	10,158	ATCO	-	3,692	2,820	7,112	10,875	11,212
Rottnest Island Authority	-	0	0	0	0	0	Esperance Power Station	-	2	25	30	5	0
Western Power	-	13,908	15,520	16,740	15,202	22,313	Kleenheat	-	4	2	10	8	6
State Total	**-**	**14,003**	**19,022**	**20,629**	**16,729**	**32,471**	**State Total**	**-**	**3,698**	**2847**	**7,152**	**10,888**	**11,218**

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

	Number of reconnections not established on time						Percentage of total reconnections					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Electricity												
Horizon Power	-	5	12	26	0	0	-	0.3	0.3	0.7	0.0	0.0
Rottnest Island Authority	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A
Western Power	-	227	224	177	145	222	-	1.6	1.4	1.1	1.0	1.0
Gas												
ATCO	-	22	15	1	0	1	-	0.6	0.5	0.0	0.0	0.0
Esperance Power Station	-	0	0	0	0	0	-	0.0	0.0	0.0	0.0	0.0
Kleenheat	-	0	0	0	0	0	-	0.0	0.0	0.0	0.0	0.0

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

Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	1,875	587	3,785	6,382	681	1,663
Rottnest Island Authority	3	0	0	0	0	0
Western Power	179,694	38,820	43,750	37,280	39,495	43,794
State Total	**181,572**	**39,407**	**47,535**	**43,662**	**40,176**	**45,457**

Table 38: Number of electricity customer premises that have had multiple interruptions

	Perth CBD and Urban areas, > 9 interruptions						Rural areas, > 16 interruptions					
Distributor	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Horizon Power	N/A	N/A	N/A	N/A	N/A	N/A	1,176	3,327	1,263	106	268	101
Rottnest Island Authority	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	34
Western Power	13,224	8,702	12,326	4,755	3,529	7,166	1,125	2,341	5,154	3,912	3,204	3,344
State Total	**13,224**	**8,702**	**12,326**	**4,755**	**3,529**	**7,166**	**2,301**	**5,668**	**6,417**	**4,018**	**3,472**	**3,479**

Table 39: Number of gas customer premises that have had 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	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
ATCO	0	640	1,534	743	532	439	0	0	1	1	1	0
Esperance Power Station	0	0	0	0	0	0	0	0	0	0	0	0
Kleenheat	0	0	0	0	0	14	0	0	0	0	0	0
State Total	**0**	**640**	**1,534**	**743**	**532**	**453**	**0**	**0**	**1**	**1**	**1**	**0**

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

	Duration of Interruptions						Frequency of Interruptions					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
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	31	28	35	33	40	37	0.3	0.3	0.3	0.2	0.2	0.2

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

	Duration of Interruptions						Frequency of Interruptions					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
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	405	390	343	326	249	244	2.6	2.4	2.2	2.1	1.9	1.8

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

	Duration of Interruptions						Frequency of Interruptions					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	302	318	330	373	359	338	3.8	4.1	3.9	3.8	3.7	3.3
Rottnest Island Authority	226	76	62	62	136	386	4	5.1	3.6	2.2	3.7	6.4
Western Power	947	979	1,020	1,030	992	997	5.1	5.3	5.2	5.4	5.4	5.2

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

	Duration of Interruptions						Frequency of Interruptions					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
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	N/A	537[62]	505	N/A	N/A	N/A	N/A	11.6	16.7	N/A	N/A	N/A

[62] In 2012-13 and 2013-14, Western Power reported reliability performance data for customers in Ravensthorpe and Bremer Bay, which were islanded from Western Power's network during this period to allow for network upgrades to improve reliability of supply. These two areas were considered "isolated systems" for the purposes of the NQ&R Code.

Table 44: Western Power SAIDI performance in 2016-17

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	343	23	232	410	1062
Distribution Network (Planned)	116	9	79	186	229
Distribution Network (Unplanned)	201	14	131	203	758
Normalised Distribution Network (Unplanned)	165	14	104	176	626

Table 45: Horizon Power SAIDI performance in 2016-17

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	233	N/A	2.4	209	846
Distribution Network (Planned)	67	N/A	2.0	59	261
Distribution Network (Unplanned)	166	N/A	0.4	150	585
Normalised Distribution Network (Unplanned)	125	N/A	0.0	107	572

Table 46: Rottnest Island Authority SAIDI performance in 2016-17

SAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	1077	N/A	N/A	1077	N/A
Distribution Network (Planned)	606	N/A	N/A	606	N/A
Distribution Network (Unplanned)	471	N/A	N/A	471	N/A
Normalised Distribution Network (Unplanned)	0	N/A	N/A	0	N/A

Table 47: Western Power SAIFI performance in 2016-17

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	2.27	0.14	1.70	2.76	5.57
Distribution Network (Planned)	0.34	0.02	0.24	0.50	0.73
Distribution Network (Unplanned)	1.53	0.11	1.09	1.84	4.17
Normalised Distribution Network (Unplanned)	1.44	0.11	1.02	1.76	3.95

Table 48: Horizon Power SAIFI performance in 2016-17

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	2.56	N/A	0.01	2.34	8.28
Distribution Network (Planned)	0.39	N/A	0.01	0.36	1.16
Distribution Network (Unplanned)	2.17	N/A	0.00	1.98	7.13
Normalised Distribution Network (Unplanned)	2.11	N/A	0.00	1.93	7.07

Table 49: Rottnest Island Authority SAIFI performance in 2016-17

SAIFI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	15.94	N/A	N/A	15.94	N/A
Distribution Network (Planned)	3.44	N/A	N/A	3.44	N/A
Distribution Network (Unplanned)	12.50	N/A	N/A	12.50	N/A
Normalised Distribution Network (Unplanned)	0.00	N/A	N/A	0.00	N/A

Table 50: Western Power CAIDI performance in 2016-17

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	151	167	137	149	191
Distribution Network (Planned)	344	413	337	371	314
Distribution Network (Unplanned)	131	123	120	110	182
Normalised Distribution Network (Unplanned)	115	123	102	100	159

Table 51: Horizon Power CAIDI performance in 2016-17

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	91.2	N/A	183.9	89.4	102.2
Distribution Network (Planned)	173.1	N/A	201.6	165.2	226.0
Distribution Network (Unplanned)	76.6	N/A	122.0	75.7	82.0
Normalised Distribution Network (Unplanned)	59.2	N/A	0.0	55.6	80.9

Table 52: Rottnest Island Authority CAIDI performance in 2016-17

CAIDI Measure	Total Network	CBD Feeders	Urban Feeders	Short Rural Feeders	Long Rural Feeders
Overall	67.6	N/A	N/A	67.6	N/A
Distribution Network (Planned)	176.2	N/A	N/A	176.2	N/A
Distribution Network (Unplanned)	37.7	N/A	N/A	37.7	N/A
Normalised Distribution Network (Unplanned)	0.0	N/A	N/A	0.0	N/A

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

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total electricity customer code complaints						
Horizon Power	137	469	291	244	627	271
Rottnest Island Authority	0	0	0	1	0	0
Western Power	712	664	547	660	640	901
Admin processes and customer service complaints						
Horizon Power	86	414	274	168	506	263
Rottnest Island Authority	0	0	0	1	0	0
Western Power	33	25	41	68	140	258
Other complaints						
Horizon Power	51	55	17	76	121	8
Rottnest Island Authority	0	0	0	0	0	0
Western Power	679	639	506	592	500	643
NQ&R code complaints[63]						
Horizon Power	23	30	31	32	34	111
Rottnest Island Authority	0	0	0	0	0	1
Western Power	712	643	765	975	693	728
Customer complaints concluded in 15 business days (electricity code complaints and NQ&R code[64] complaints combined)						
Horizon Power	30	31	62	177	364	275
Rottnest Island Authority	0	0	0	1	0	0
Western Power	919	1,017	1,021	1,320	1,152	1,520

[63] Complaints raised about the standards in Part 2 and section 14(3) of the NQ&R Code.

[64] 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.

Technical Quality of Supply[65] complaints						
Horizon Power	23	30	31	32	34	111
Rottnest Island Authority	0	0	0	0	0	1
Western Power	1,307	1,311	765	1,889	1,803	2,245

Table 54: Complaints received by gas distributors (gas compendium)

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total complaints						
ATCO	36	16	2	203	415[66]	427
Esperance Power Station	0	0	0	0	0	0
Kleenheat	2	0	0	3	1	0
	36	16	2	203	416	427
Admin processes and customer service complaints						
ATCO	-[67]	-	0	132	211	163
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	0	0	0
Other Complaints						
ATCO	-	-	2	71	204	264
Esperance Power Station	-	-	0	0	0	0
Kleenheat	-	-	0	3	0	0

[65] This is the number of complaints received about any technical quality of supply issue (as defined under the SCONRRR framework).

[66] This was incorrectly reported as 513 complaints in the 2016 Distributors Report.

[67] Data was requested from licensees for these items from 2013-14 onwards.

Table 55: Complaints received by gas distributors (quality and reliability of supply)

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total number of complaints						
ATCO	-	9	23	33	98	89
Esperance Power Station	-	0	0	0	0	0
Kleenheat	-	0	0	0	1	4
Connection and augmentation complaints						
ATCO	-	4	6	16	52	49
Esperance Power Station	-	0	0	0	0	0
Kleenheat	-	0	0	0	0	2
Reliability of supply complaints						
ATCO	-	2	10	4	32	26
Esperance Power Station	-	0	0	0	0	0
Kleenheat	-	0	0	0	0	2
Quality of supply complaints						
ATCO	-	3	5	5	0	4
Esperance Power Station	-	0	0	0	0	0
Kleenheat	-	0	0	0	0	0
Network charges and costs complaints						
ATCO	-	0	2	8	14	10
Esperance Power Station	-	0	0	0	0	0
Kleenheat	-	0	0	0	1	0

Table 56: Percentage of all gas customer complaints concluded in 15 business days (combined total of gas compendium and quality and reliability complaints)

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	-	-	100.0%	89.0%	86.5%	87.0%
Esperance Power Station	-	-	-	-	-	-
Kleenheat	-	-	-	100.0%	100.0%	75.0%

Table 57: Electricity and gas distributor call centre performance

	Total number of calls						Percentage of answered within 30 seconds					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	82,587	103,301	14,437[68]	11,452	12,794	13,645	88.5	75.9	69.0	79.3	71.1	72.6
RIA	5,840	6,173	4,850	5,250	1,955	814	95.0	81.2	90.8	93.3	89.4	93.1
Western Power	531,554	510,935	455,368	388,358	357,105	343,300	75.1	80.0	82.9	84.6	77.6	79.2
Electricity Total	**619,981**	**620,409**	**474,655**	**405,060**	**371,854**	**357,759**						
ATCO	65,098	66,933	77,388	84,106	84,685	79,316	79.1	80.9	80.9	75.8	77.9	83.5
Kleenheat[69]	214,280	220,710	235,698	233,363	222,505	285,887	82.4	77.8	77.8	76.6	72.6	72.6
Gas Total	**279,378**	**287,643**	**313,086**	**317,469**	**307,190**	**365,203**						

	Average duration before a call is answered by an operator (seconds)						Percentage of unanswered calls					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	18	36	40	25	32	26	1.6	2.6	15.1	8.9	13.7	5.6
RIA	12	13	12	12	12	12	5.0	2.1	2.7	2.5	3.6	10.0
Western Power	26	12	14	11	15	17	9.2	7.0	4.8	3.9	5.8	4.5
ATCO	25	31	27	30	33	21	2.5	3.2	2.7	2.8	3.2	3.1
Kleenheat	28	19	21	22	25	32	3.7	2.2	2.2	2.9	2.6	3.2

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

[69] The Kleenheat call centre also handles calls for other Wesfarmers Kleenheat gas businesses, including its retail operations. The data presented in this table includes all calls to the Kleenheat call centre.

Table 58: Residential and non-residential gas consumption

	Residential gas consumption (GJ)						Non-residential gas consumption (GJ)					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
ATCO[70]	9,528,366	10,017,511	10,087,162	9,816,762	10,049,915	11,036,506	1,177,507	1,241,075	1,263,629	1,286,095	1,319,166	1,383,781
Esperance Power Station	5,506	3,567	3,969	3,981	4,014	4,017	243	26,481	28,276	32,669	32,342	20,570
Kleenheat	3,536	6,293	6,769	7,489	7,348	8,531	4,666	227	194	225	218	0[71]
State Total	**9,537,408**	**10,027,371**	**10,193,727**	**9,828,232**	**10,061,277**	**11,049,054**	**1,182,416**	**1,267,783**	**1,292,099**	**1,318,989**	**1,351,726**	**1,404,351**

Table 59: Percentage of unaccounted for gas on distribution systems

	Unaccounted for Gas (GJ)						Percentage unaccounted for gas					
Distributor	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
ATCO[72]	920,371	813,898	707,191	705,987	715,966	744,053	-	-	-	-	-	-
Esperance Power Station	0	0	0	0	0	425	0.0	0.0	0.0	0.0	0.0	1.7
Kleenheat	1,158	866	943	529	562	512	3.0	13.3	13.5	6.9	7.4	6.0
State Total	**921,529**	**814,764**	**708,134**	**706,516**	**716,528**	**744,990**						

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

[71] In previous years, Kleenheat reported non-residential gas consumption in error, due to some residential accounts being set up in business names (residential homes owned by businesses, such as charities). In 2016-17, it reported zero non-residential gas consumption by small use customers on its systems.

[72] 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 60: Gas main leak repairs

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	830	835	842	575	781	943
Esperance Power Station	0	2	0	0	2	1
Kleenheat	0	1	1	25	41	11
State Total	**830**	**838**	**843**	**600**	**824**	**955**

Table 61: Gas meter leak repairs

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	816	486	471	3,527[73]	3,209	3,415
Esperance Power Station	0	0	0	0	2	3
Kleenheat	1	0	2	0	44	1
State Total	**817**	**486**	**473**	**3,527**	**3,255**	**3,419**

Table 62: Gas property service connection meter repairs

Distributor	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ATCO	5,657	6,614	7,182	5,575	6,040	5,815
Esperance Power Station	0	3	0	1	0	1
Kleenheat	0	0	0	42	5	25
State Total	**5,657**	**6,614**	**7,182**	**5,618**	**6,045**	**5,841**

[73] 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 63: Number of streetlights and streetlight faults logged by distributors in each region

	Total number of street lights						Street light faults logged					
Metropolitan	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	5,441	5,993	8,325	8,022	8,332	8,066	180	108	149	158	130	163
Western Power	198,070	199,767	207,146	213,526	219,734	223,721	34,271	36,525	33,447	28,647	28,388	33,145
State Total	**203,511**	**205,760**	**215,471**	**221,548**	**228,066**	**231,787**	**34,451**	**36,633**	**33,596**	**28,805**	**28,518**	**33,308**
	Total number of street lights						**Street light faults logged**					
Regional	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	9,978	10,331	11,298	11,007	11,092	11,255	168	166	168	177	183	248
RIA	190	190	190	189	189	189	18	46	18	112	79	22
Western Power	37,595	37,907	38,539	39,202	39,769	39,931	3,137	3,414	3,220	3,428	4,061	1,549
State Total	**47,763**	**48,428**	**50,027**	**50,398**	**51,050**	**51,375**	**3,323**	**3,626**	**3,406**	**3,717**	**4.323**	**1,819**

Table 64: Metropolitan and regional area streetlight faults that are repaired after the prescribed timeframe in each region

	Number of faults fixed in > 5 days						Percentage					
Metropolitan	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	51	13	30	10	21	25	28.3	7.8	20.1	6.3	16.2	15.3
Western Power	1,050	899	218	215	421	2,194	3.1	2.5	0.7	0.8	1.5	6.6
State total	**1,101**	**912**	**248**	**225**	**442**	**2,219**						
	Number of faults fixed in > 9 days						**Percentage**					
Regional	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Horizon Power	5	1	14	27	40	46	3.0	0.9	8.3	15.3	21.9	18.5
Rottnest Island Authority	7	11	4	0	7	1	38.9	23.9	22.2	0.0	8.9	4.5
Western Power	91	173	32	15	19	70	2.9	5.1	1.0	0.4	0.5	4.5
State Total	**103**	**185**	**50**	**32**	**66**	**117**						

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**)[74] 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.[75]

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.[76] 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.[77]

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**).[78] 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.

[74] IEEE 1366-2003 has been superseded by IEEE 1366-2012. The data provided by distributors in this report is based on IEEE 1366-2003.

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

[76] 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.

[77] 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.

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

SCONRRR distribution feeder classifications

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

Table 65: Distribution feeder classifications (SCONRRR)

Description			
CBD[79]	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.

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