



**Planning,
Industry &
Environment**

**New South Wales
2018-19 Gas Networks
Performance Report**

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Abbreviations

The Act	The NSW <i>Gas Supply Act 1996</i>
The Department	Department of Planning, Industry and Environment
ECCS	Division of Energy, Climate Change and Sustainability
GJ	Gigajoule
IPART	Independent Pricing and Regulatory Tribunal
kPa	Kilopascal: pressure units
KPI	Key Performance Indicator
LGA	Local Government Area
LPG	Liquefied Petroleum Gas
MAOP	Maximum Allowable Operating Pressure
MJ	Megajoule
PJ	Petajoule
The Regulation	The NSW Gas Supply (Safety and Network Management) Regulation 2013
SAOP	Safety and Operating Plan
SNG	Simulated Natural Gas
TJ	Terajoule
TLPG	Tempered Liquefied Petroleum Gas
UAFG	Unaccounted for Gas (difference between gas entering and leaving the system)

Table 1: Gas units of measurement.
(a joule is the international unit for measuring energy content)

1000 joules (J)	1 kilojoule (kJ)
1000 kilojoules	1 megajoule (MJ)
1000 megajoules	1 gigajoule (GJ)
1000 gigajoules	1 terajoule (TJ)
1000 terajoules	1 petajoule (PJ)

Note: One standard cubic metre of natural gas is approximately 38 MJ. This figure can vary as it relates to the heating value of a particular sample of gas.

Executive Summary

This 2018-19 Gas Networks Performance Report on the operations of natural gas and liquefied petroleum gas (LPG) distribution networks in NSW has been prepared by the Division of Energy, Climate Change and Sustainability (ECCS) at the Department of Planning, Industry and Environment (the Department).

These networks are regulated under the *Gas Supply Act 1996* (the Act) and the Gas Supply (Safety and Network Management) Regulation 2013 (the Regulation). This report consolidates and comments on performance data and information provided by the NSW gas network operators.

Under the Regulation, network operators are required to prepare a Safety and Operating Plan (SAOP), which is lodged with the Department. The SAOP governs the operations. The network operator is then audited annually by an independent auditor to assess performance against the SAOP. This process has proven effective in providing safe and reliable network operations.

Many factors influence network performance including network scale, age, construction materials and operating regimes. Comparisons in performance across networks and between jurisdictions must consider the factors that differentiate the networks and influence their performance.

Key Performance Indicators (KPI) have been developed by the Department to monitor and analyse the performance of the network operators against network integrity, reliability, and safety parameters.

Much of the data reported is presented on an annual basis to identify trends and trajectory of performance.

Natural gas networks

The NSW network operators have demonstrated and managed the assets consistently in the areas of network integrity, reliability and safety.

The Department acknowledges that the network operators are continually looking at ways to improve their performance, in accordance with the Regulation, and the Department is working with the network operators to achieve the best possible results. It must be noted, however, that some figures in this report differ from those presented in previous reports. This is the result of the network operators revising or improving the way in which information is recorded and collated.

High-pressure pipelines (unlicensed)

Jemena Gas Networks (NSW) Ltd, Evoenergy and Australian Gas Networks (Albury) operate high-pressure unlicensed pipelines (pressure > 1050 kPa) as part of their natural gas networks.

Liquefied petroleum gas (LPG) networks

Due to the size and complexity of LPG networks, comparison to the natural gas network is not appropriate. The analysis of LPG network information can be viewed in Appendix A.

Overall it would appear that the LPG networks are maintaining the safety and integrity requirements. However, due to the nature of LPG networks being small in comparison to natural gas networks, any incidents would appear significant relative to total customer numbers and the size of the network.

Note: Given the significant differences between LPG and larger natural gas networks, the Department continues to consult with LPG network operators to improve the LPG reporting regimes while taking into account the unique characteristics of the LPG networks.

Key findings

The collective state-based KPIs indicate that assets are being maintained and operated within standards.

Summary of KPIs for the 2018-19 reporting period:

- The size of the NSW gas network has decreased to 27,899 kilometres. This is a decrease of approximately 6 per cent or over 1700 kilometres. This is not due to assets being decommissioned but a major effort to improve geospatial data by removing duplication and false information within the network location data.
- The number of consumers connected to natural gas in NSW has risen to over 1.49 million.
- The number of new consumers has continued to grow with this reporting period recording the third consecutive annual result of over 50,000 new connections.
- The unaccounted for gas (UAFG) figure for NSW remains within the 2 to 3 percent range at 2.77 per cent.
- The LPG networks have reported maintaining their asset length with a small growth of connections. The assets have also continued to indicate integrity with a low UAFG of 0.6 per cent.

The results presented in this report indicate that the network operators continue to manage and grow their assets while maintaining the integrity of the existing and new assets.

The Department reviews all annual reports and continues to consult closely with the network operators in the ongoing evaluation of the reporting requirements. This supplements the Department's immediate and periodic reviews conducted on an ongoing basis.

1. Introduction

This report consolidates performance information and data provided by each of the gas distribution network operators for the 2018–19 financial year in accordance with the reporting requirements outlined in the [NSW Gas Networks Performance Reporting Guidelines 2017](#).

This report:

- presents the Department’s interpretation and commentary on the information and data provided by the operators and compares overall performance
- identifies areas of achievement and opportunities for improvement for the NSW gas industry as a whole.

1.1 Report structure

This report summarises data provided by the distribution network operators in accordance with the annual reporting requirements prepared by the Department and has the following structure:

- **Chapter 1** Introduction
- **Chapter 2** Network asset information
- **Chapter 3** Network integrity and safety information. This chapter also presents KPIs, derived from the data provided.
- **Chapter 4** Network reliability and consumer-related matters. This chapter also presents KPIs, derived from the data provided.
- **Chapter 5** High-pressure (unlicensed) pipeline activities
- **Appendix A** LPG networks in NSW and networks performance data
- **Appendix B** Natural gas industry within NSW
- **Appendix C** Definitions.

1.2 Limitations of this report

There are currently eight gas network operators in NSW. Six of these operators reticulate natural gas, while the remaining two operate distribution systems that reticulate LPG. All eight gas network operators are regulated by the Department under the Act. Annual reporting is conducted in accordance with the requirements of the Regulation.

The focus of this report relates primarily to the natural gas network. The LPG distribution network operators have the same reporting requirements as natural gas network operators however, the analysis of this data is detailed separately (see *Appendix A*) due to the small size and complexities of these networks. Licensed high-pressure transmission pipeline systems are not addressed in this report (please refer to the *2018-19 Licensed Pipelines Performance Report*).

The Department recognises the efforts made by the network operators on improving the quality of information, data and reporting provided. Where possible, the Department has identified in this report the limitations of the information and data provided.

Where the method of gathering data has changed, direct comparisons may not be an accurate way of assessing the performance of the asset or network operator. In cases such as these, some corresponding data has been removed from charts and tables.

There are many factors which influence network performance including size, age, construction materials and operating regimes. Therefore, consideration must be given to the factors which may influence the overall performance and the manner in which information is gathered and reported.

2. Network asset information

2.1 Annual reporting requirements

To assess the overall performance of the gas network several factors must be considered including:

- network pipe length (less than 1,050 kPa¹), Chart 2.2
- total quantity of gas entering the network
- quantity of gas delivered to custody transfer points
- new regions connected to gas supply networks.

Network operators are required to report network details by district or groups of districts for network safety and reliability reasons. It is important that any trends occurring in a localised area are identified and reported, rather than being potentially diluted within aggregated data.

2.2 Key performance indicators

The KPI adopted by the Department for monitoring accuracy of network information is:

- Unaccounted for gas (UAFG).

2.3 Natural gas networks - asset information

In 2018-19 the length of the natural gas network decreased by 1787 kilometres, with a total length of 27,899 kilometres as shown in Chart 2.2. This is due to a major review of geospatial data for the gas networks as part of a project to implement new geospatial systems. Gas delivered from the network in 2018-19 was approximately 102.5 PJ or about 2.7 billion standard cubic metres of gas to consumers in NSW.

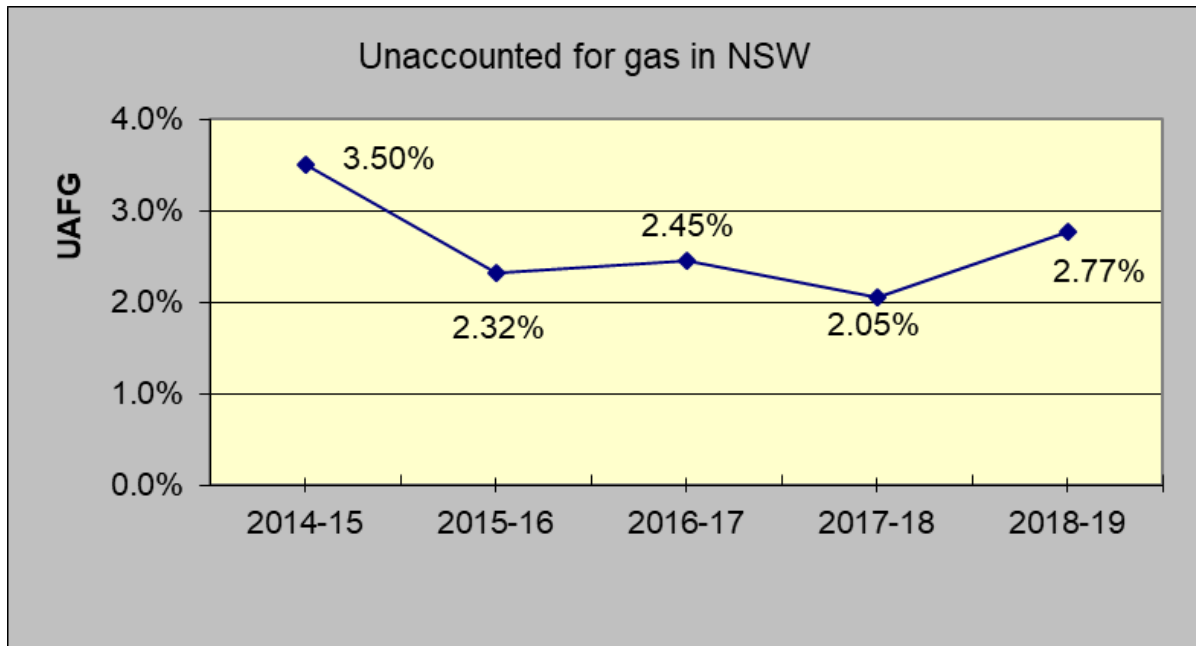
Table 2.1 Natural gas networks in NSW: summary statistics

Reporting period	Network growth in NSW in km	Gas entering the network in PJ	Gas delivered in PJ	Percent unaccounted for gas (UAFG) %
2014 - 15	390	113.0	109.1	3.50
2015 - 16	352	112.4	109.6	2.32
2016 - 17	354	99.2	96.7	2.45
2017 - 18	393	101.8	99.7	2.05
2018 - 19	-1787 ²	105.4	102.5	2.77

¹ Operating pressure classes are: (1) Pressure less than or equal to 1,050 kPa and (2) Pressure greater than 1,050 kPa.

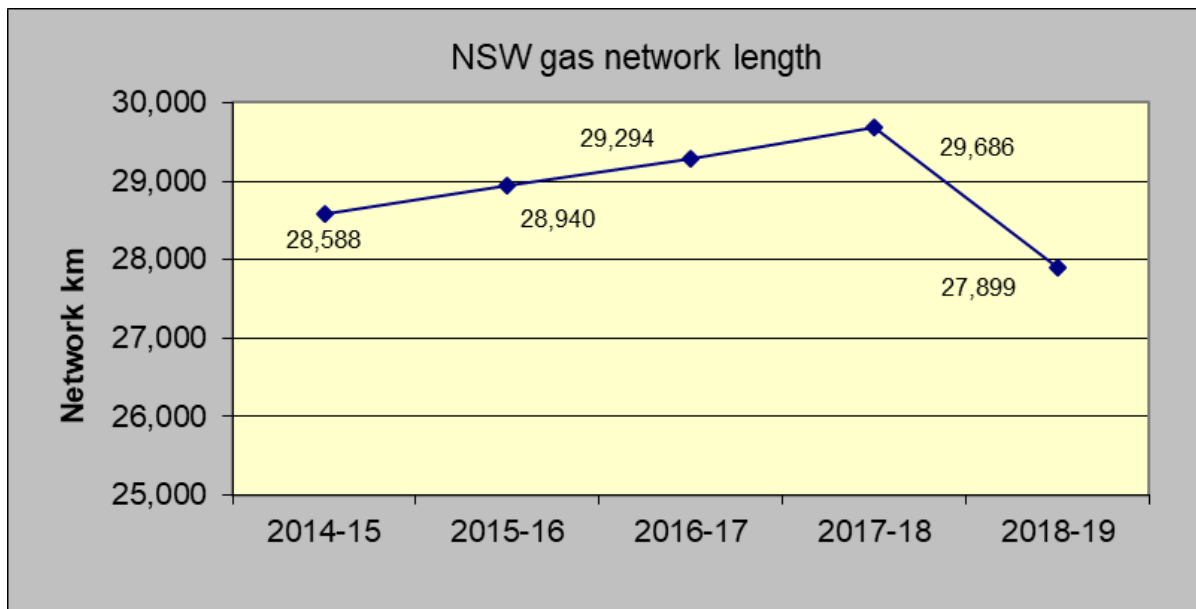
² This reduction is due to verification of existing assets and not from any decommissioning actions.

Chart 2.1 Unaccounted for gas trend in NSW



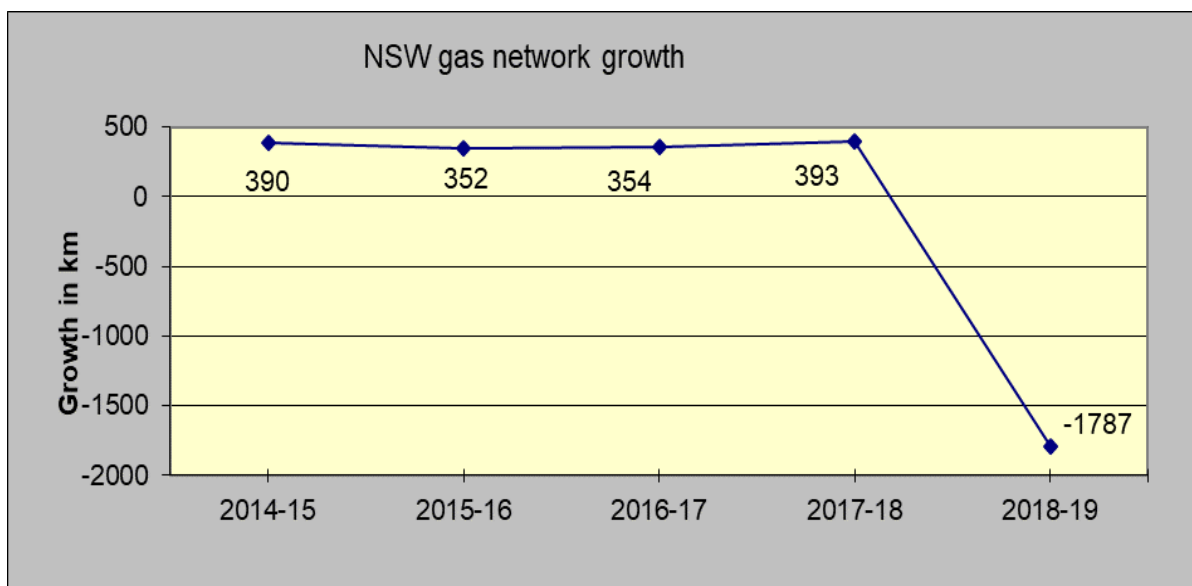
The UAFG data is used as an indicator for the soundness of the network. It is calculated based on the amount of gas entering the network compared to the amount of gas being delivered to consumers. The UAFG of the 2018-19 period was 2.77 per cent which is within metering error allowances of between 2 to 3 per cent.

Chart 2.2 NSW gas network length



The reported gas network length in NSW has declined due to a major review of geospatial data accuracy as part of the implementation of a new geospatial system. The reduction in gas network length is not due to actual decommissioning of gas networks, rather improvements in the accuracy of geospatial data. The reported 2018-19 data is considered to have higher accuracy than previous reporting periods.

Chart 2.3 Gas network length growth



Data provided by network operators regarding construction of network extensions indicates that the physical length of network assets has increased for the 2018-19 period. However, an overall decline of NSW network size is observed as this physical network growth has been more than offset by the reduction in overall network length due to the improved geospatial information. The length of new network construction in the 2018-19 period is comparable to previous reporting periods.

2.3.1 New regions

No new regions have been reticulated during the 2018-19 reporting period, therefore consumer growth has been occurring within existing networks areas.

2.4 Conclusion

The total length of the gas networks in NSW has decreased by 1787 kilometres due to the availability of improved geospatial information for existing network assets. However physical network construction data has shown consistent new network construction levels compared to previous reporting periods. The overall length of the NSW gas networks is currently 27,899 kilometres.

The amount of UAFG has been reported to have reduced to 2.77 per cent of gas entering the system. This is a measure of how secure the gas network is and is within metering error allowances.

3. Network integrity and safety information

3.1 Annual reporting requirements

This information measures the level of product loss through escapes and as a result of third-party activity. It provides an indication of how secure the gas network assets are and how activity around the assets affect performance. It also deals with the preventative measures associated with leak surveys, including:

- number of gas leaks reported to network operator by third parties, by pressure class
- kilometres of pipe subjected to leak surveys
- number of leaks found during leak surveys
- number of recorded mechanical damage incidents to gas networks, by type and source, and by pressure class and location
- number of emergency exercises or simulations conducted
- number of calls to a 'one-call' system (Dial Before You Dig) received about work near networks.

3.2 Key performance indicators

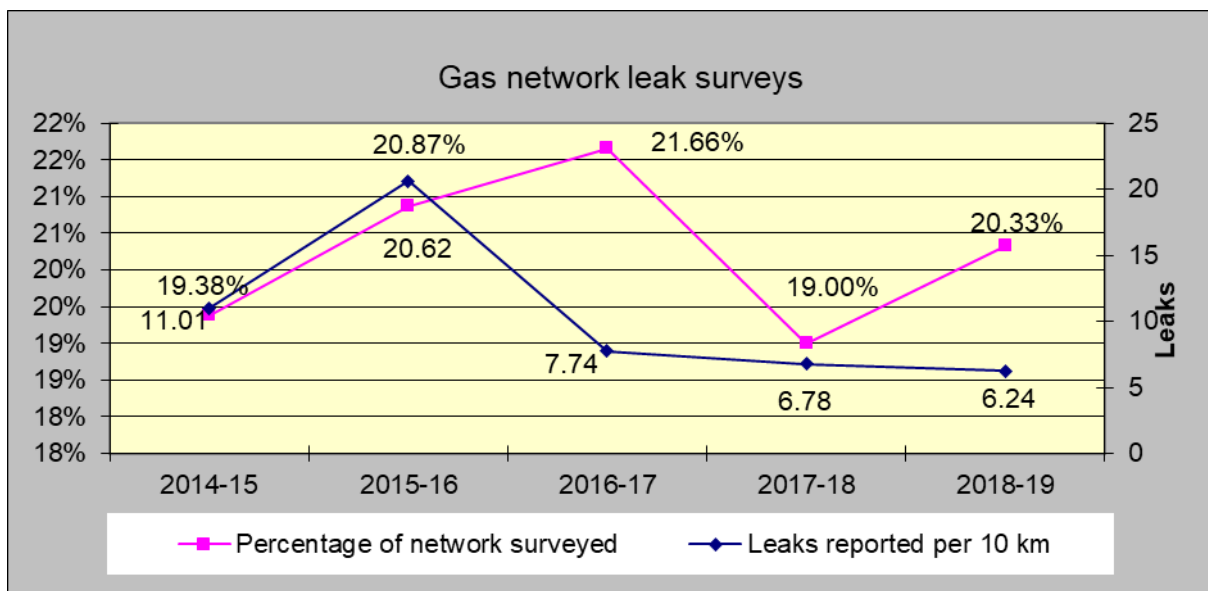
The key performance indicators adopted by the Department for monitoring network integrity and safety include:

- leak surveys as a percentage of total pipe length, Table 3.1/Chart 3.1
- leaks found per 10 kilometres of pipe surveyed, Table 3.1/Chart 3.1
- mechanical damage incidents per 10 kilometres of pipe, Table 3.1/Chart 3.2
- gas leaks per 10 kilometres of pipe reported by third parties, Chart 3.3
- gas leaks per 1000 customers as reported by third parties, Chart 3.3
- mechanical damage incidents per 1000 consumers, Table 3.1
- number of emergency exercises, Table 3.1.

Table 3.1 Network integrity and safety for NSW

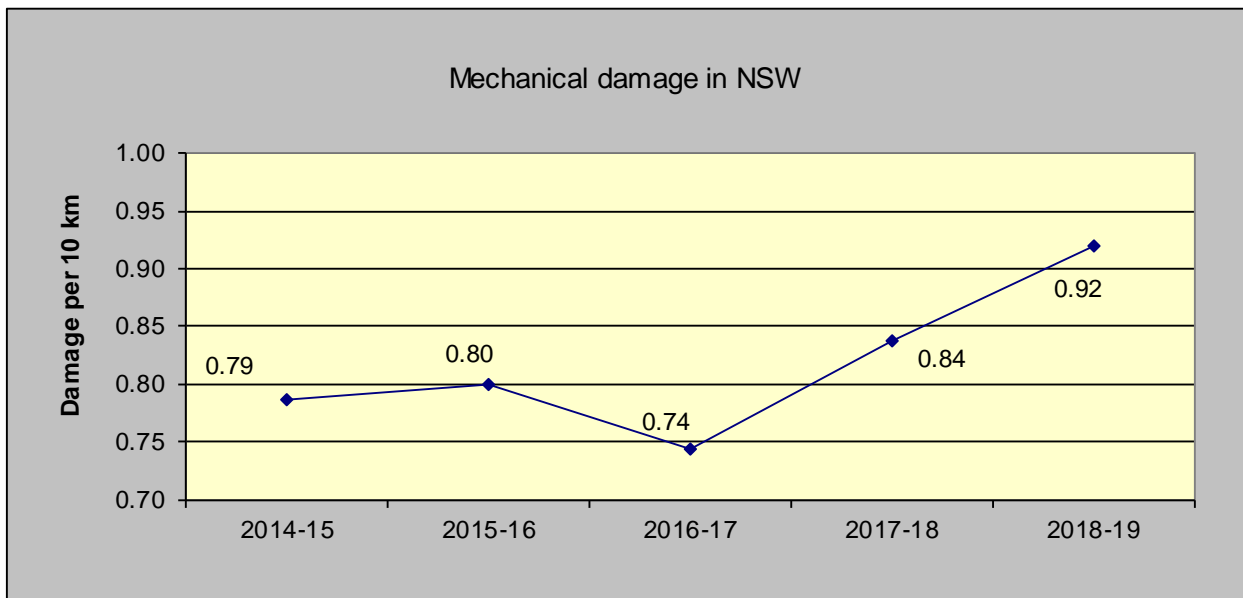
Reporting period	Percentage of network leak surveyed	Leaks found per 10 km	Mechanical damage per 10 km	Mechanical damage per 1000 consumers	Emergency exercises
2014 - 15	19.38	11.01	0.79	1.69	4
2015 - 16	20.86	20.62	0.80	1.69	4
2016 - 17	21.65	7.74	0.74	1.54	5
2017 - 18	19.00	6.78	0.84	1.70	4
2018 - 19	20.33	6.24	0.92	1.72	1

Chart 3.1 Gas network leak survey and reporting



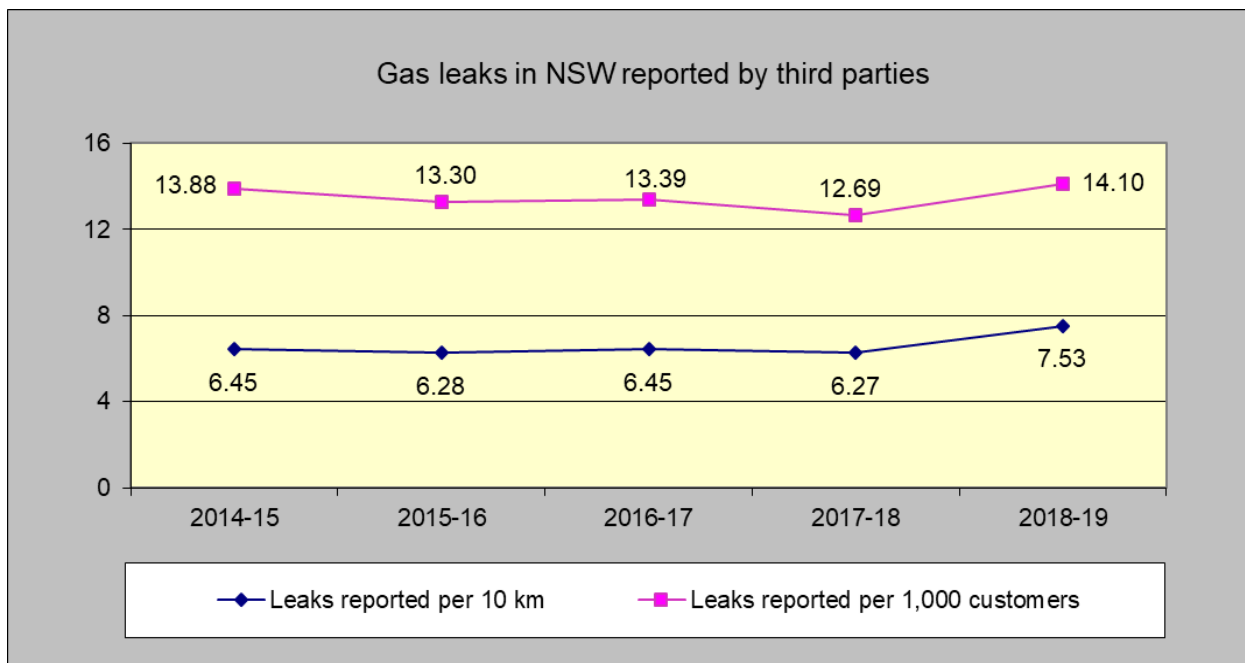
Leak surveys are carried out on the gas networks in areas identified as high activity areas and to identify assets that require remediation works. The number of leaks per reporting period can vary widely depending on the assets that have been surveyed and possible resurvey of previously reviewed areas.

Chart 3.2 Reported mechanical damage on gas networks



Mechanical damage is an indicator of third-party activity that has resulted in physical contact with network assets. This indicator also allows the network operator to verify if the third party had contacted Dial Before You Dig before work occurred in the area of concern. This reporting period has reported the highest mechanical contact on gas network assets compared to the previous five reporting periods.

Chart 3.3 Gas leaks reported by third parties



Reported gas leaks by third parties provides an indication of locations that have leaking assets and any areas that may require rectification works. The 2018-19 reporting period has identified the highest number of reported third party leaks compared to the five previous reporting periods.

3.2.1 Natural gas - networks surveys

It is not a requirement for operators to survey their entire gas networks annually. Gas network operators however should survey 100 per cent of their network within a span of 5 years. The total amount of the gas network that was surveyed in the 2018-19 period was reported at 20.33 per cent.

3.3 Conclusion

The gas network operators have been working with third party contractors to reduce impacts on their gas networks. The number of 'one-call' contacts made from the reporting period of 2012/13 to 2018/19 has increased from approximately 71,000 to approximately 530,000. The 2018-19 reporting period recorded the highest number of 'one-call' contacts. The Act requires a proponent to contact Dial Before You Dig before excavation work can occur.

The number of gas leaks reported per 10 kilometres and per 1000 customers have increased in the 2018-19 reporting period which is reflected in the reported number of leaks reported in the reporting period. The number of leaks per 10 kilometres only shows a decrease due to reduction of overall network length as a result of the improved geospatial data. Mechanical damage of gas networks has also reportedly increased which correlates with the increasing activity of NSW construction and infrastructure projects.

4. Network reliability and consumer-related matters

4.1 Annual reporting requirements

This data indicates reliability of the gas networks and compliance with odorant levels. It also indicates the network operators' ability to respond to incidents within a specific time period. The consumer-related data is used to assist in the KPI analysis in relation to how many consumers are affected by these events. Measurements include:

- number of consumers connected to the network (total number), Chart 4.1
- number of new consumers connected to the network (total number), Chart 4.2³
- loss of supply (duration, total unplanned consumer hours lost - five or more customers), Table 4.1/Chart 4.3
- loss of supply (number, total unplanned numbers of loss of supply instances - five or more customers), Table 4.1/Chart 4.3
- poor supply pressure (total number of instances)
- odorant levels not to specification (total number of instances), Table 4.1
- number of incidents or emergencies responded to, Table 4.1/Chart 4.4
- incidents or emergency responses within 60 minutes of notification (total number), Table 4.1/Chart 4.5.

4.2 Key performance indicators

The KPIs adopted by the Department for monitoring network reliability and safety are:

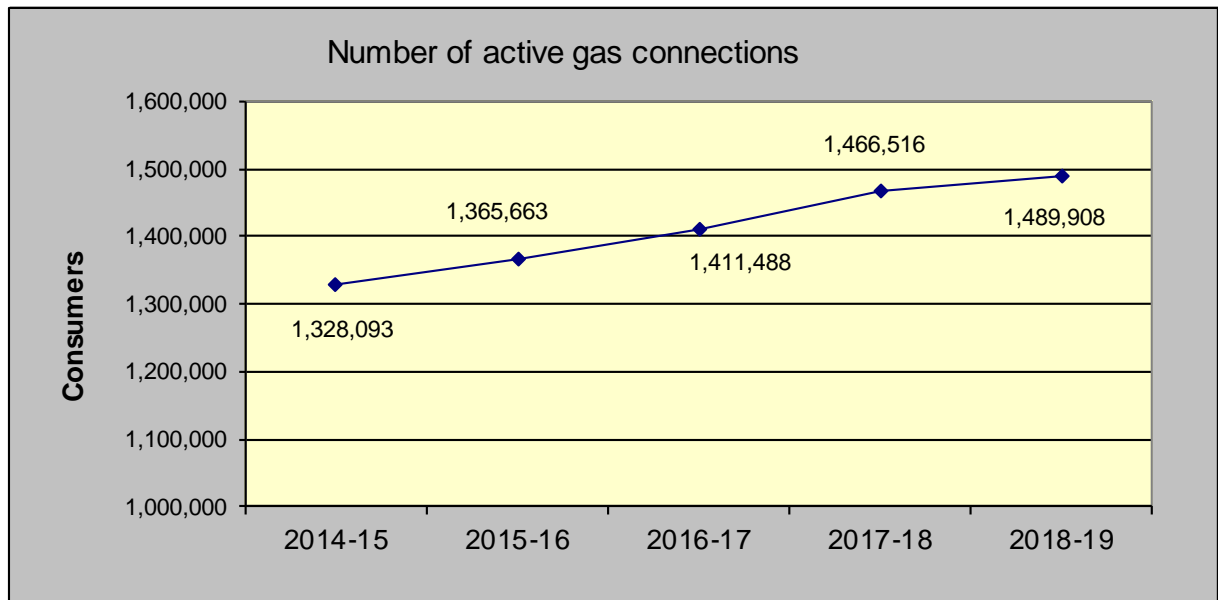
- loss of supply (total unplanned consumer hours lost - 5 or more customers) per 1000 customers, Table 4.1/Chart 4.3
- percentage of calls responded to within 60 minutes, Table 4.1/Chart 4.5

³ This figure may not represent all consumers connected to natural gas as a connection method for high rise apartments from 2018 now allows for one meter installation for the complex instead of individual metering for each consumer.

Table 4.1 Reliability and consumer-related measures

Reporting period	Unplanned consumer hours lost per 1000 consumers	Unplanned loss of supply incidents per 1000 km	Number of out of spec gas or odorant levels reports	Number of incidents/emergencies per 1000 consumers	% incidents/emergencies responded to within 60 minutes
2014 - 15	5.53	2.24	3	2.39	98.67
2015 - 16	12.18	1.31	3	1.98	98.78
2016 - 17	12.34	1.30	6	1.96	98.70
2017 - 18	18.90	1.25	1	2.10	98.77
2018 - 19	35.36	1.68	0	1.83	99.05

Chart 4.1 Active gas connection trend



Active gas connections represent the number of gas supply points actively consuming gas during the reporting period. This information is used in KPI calculations.

Chart 4.2 New customer connection trend

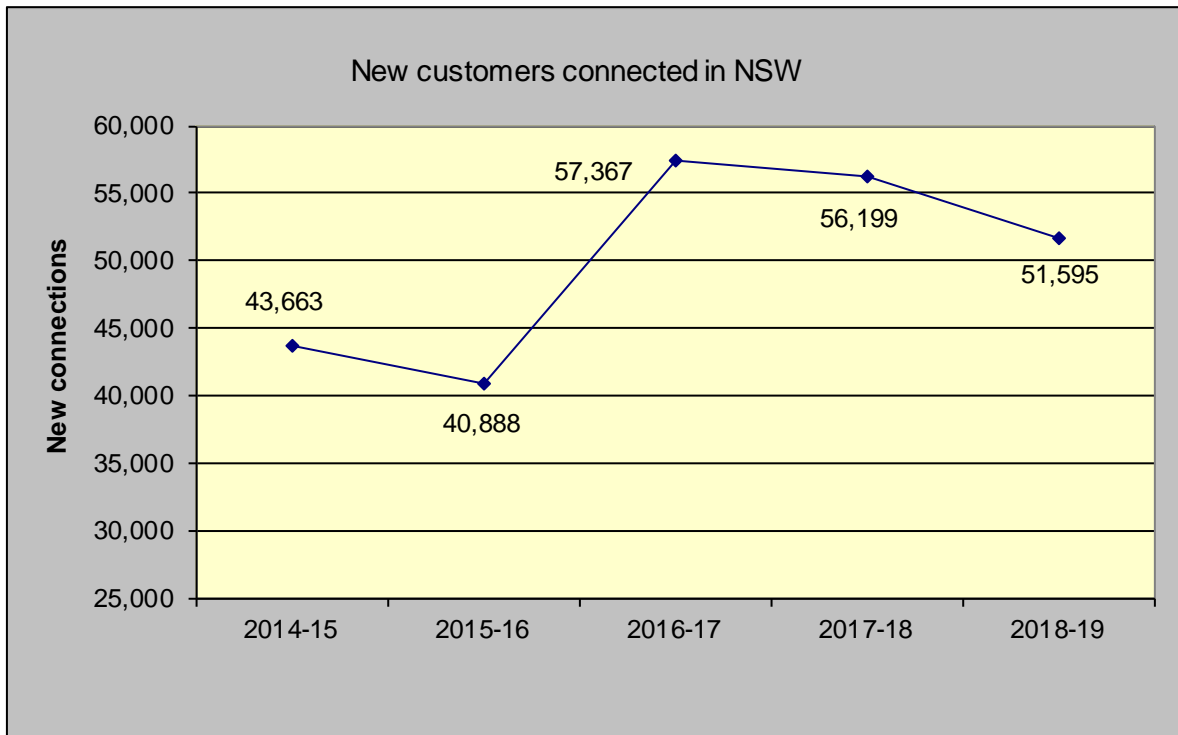


Chart 4.3 Consumers off supply trend

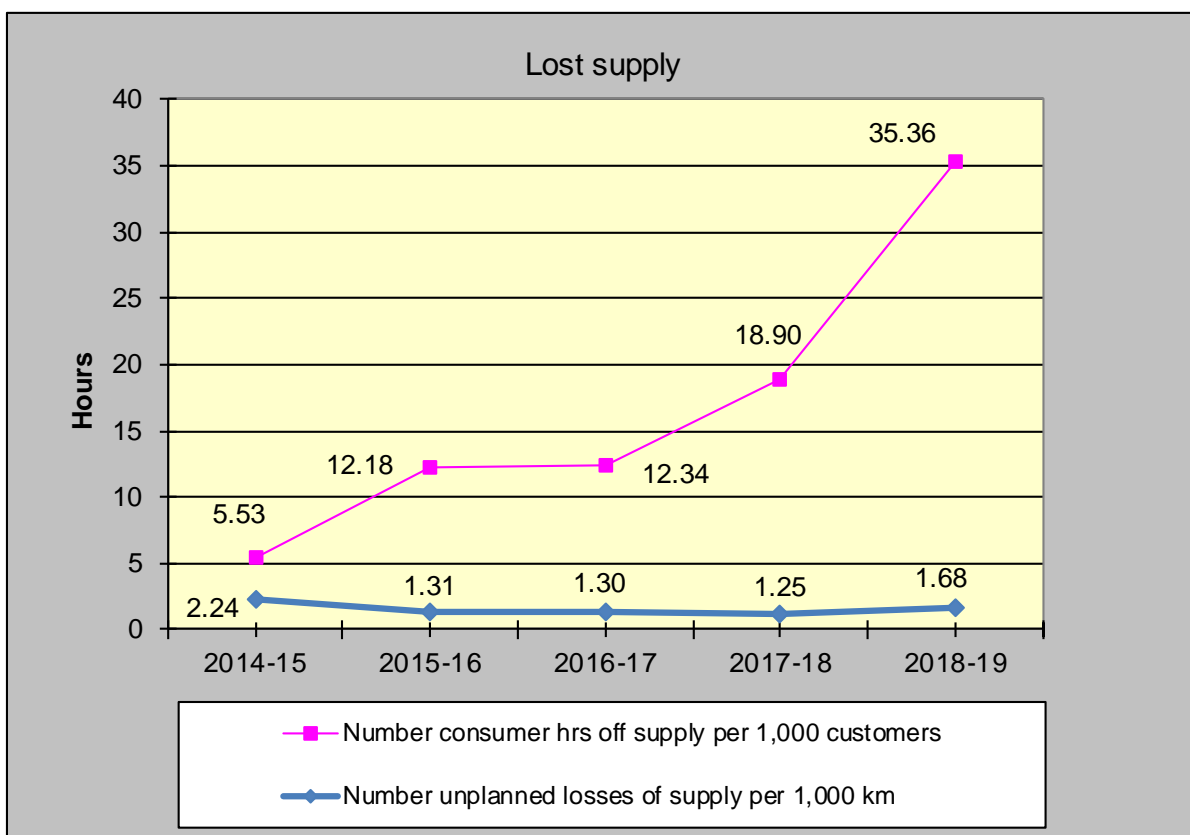


Chart 4.3 indicates how often the gas network has lost supply and the time required to re-establish supply to a consumer.

In the 2018-19 reporting period there were three major loss of supply events that led to the increase in the total number of hours consumers were without supply. The Department is working with the gas networks operators to identify how these incidents occurred and procedures to reduce or stop these events occurring in the future.

Chart 4.4 Reported gas incidents per every 1000 consumers

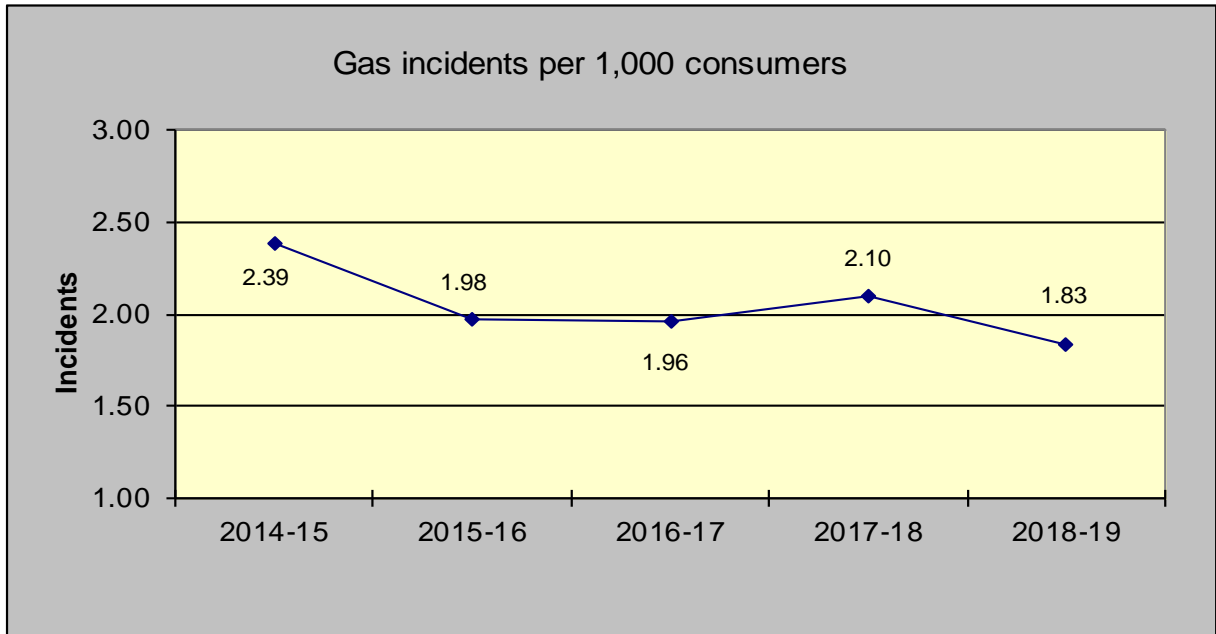
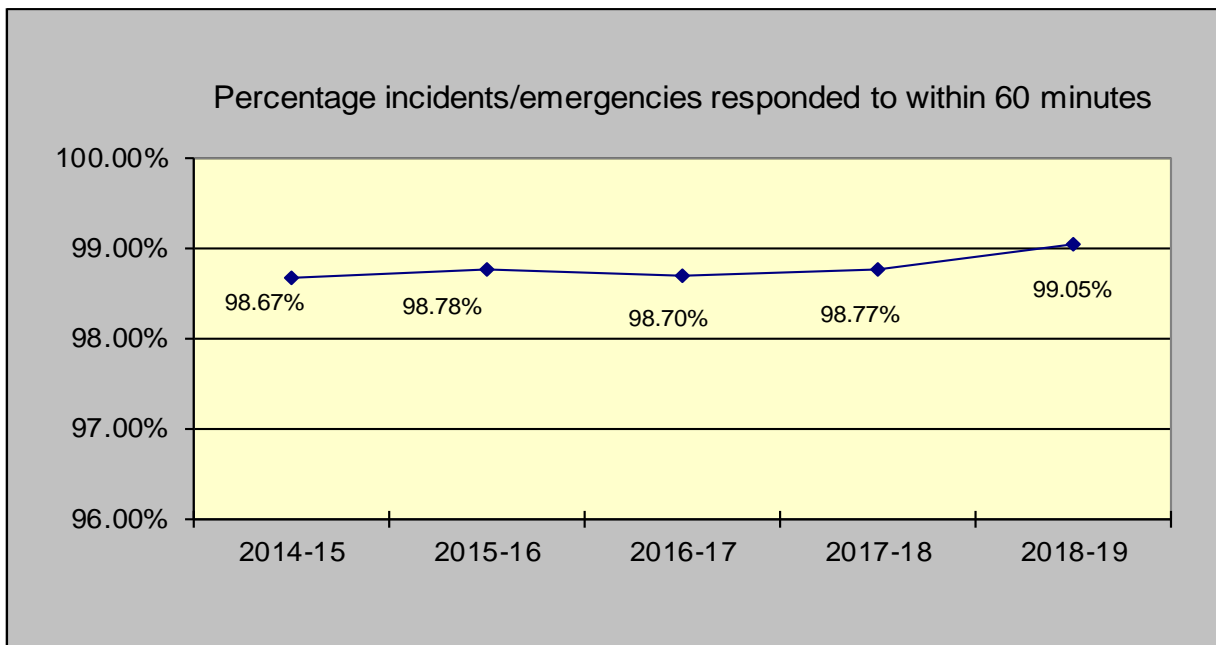


Chart 4.4 illustrates the trend of the number of incidents per every 1000 consumers.

Chart 4.5 Emergency responses within a 60 minute timeframe



Incident response data provides an indication of the ability of gas network personnel to respond to an incident within an hour.

4.3 Conclusion

The number of consumers connected to gas networks has increased for the third consecutive annual period by more than 50,000. This translates to a total number of approximately 1.5 million consumers in NSW.

The number of hours of loss of gas supply has increased in the 2018-19 reporting period which was attributable to three specific incidents which had extended loss of supply durations.

The response times to emergencies and incidents remain healthy, with over 99 per cent of incidents being responded to within 60 minutes in the 2018-19 reporting period.

5. High-pressure (unlicensed) pipeline activities

5.1 General

Jemena (Sydney), Jemena (Coastal), Evoenergy, and Australian Gas Networks (Albury) operate high-pressure pipelines (>1050 kPa) as part of their network activities. Network operators are required to review matters such as pressure, location, land use, security and risk assessments on a periodic basis as defined under Australian Standard AS 2885: Pipelines - Gas and Liquid Petroleum.

The Department's annual reporting requirements request the following information:

- accidents, escapes and ignitions
- integrity assessment/monitoring
- operational performance.

NSW has approximately 179 kilometres of mains operating in the network that are running at pressures above 1050 kPa. These distribution mains contain a larger amount of energy and are important feeders to the distribution network. This is why they require a more in-depth review of operation and safety aspects to protect the public, personnel and environment.

5.2 Accidents, escapes and ignitions

The following issues are covered within Table 5.1:

- incidents
- loss of containment (LOC)
- ignitions
- injuries involving the pipeline
- damage involving the pipeline.

Table 5.1 Accidents, escapes and ignitions

Reporting period	Incidents	Loss of containment	Ignitions	Injuries	Damage
2014 - 15	0	0	0	0	0
2015 - 16	2	0	0	0	0
2016 - 17	3	0	0	0	0
2017 - 18	0	1	0	0	0
2018 - 19	0	0	0	0	0

5.3 Integrity assessment/monitoring

The following issues are covered within Table 5.2:

- Integrity assessment
- pipeline patrols
- supervised activity around the pipeline
- field inspections
- **cathodic protection (CP) and coating defects.**

Table 5.2 Integrity assessment/monitoring

Reporting period	Supervised activities per km	Activities that contacted operator by Dial Before You Dig (%)	Defects requiring repair per 1000 km	CP units operating correctly (%)	Pipeline covered by CP systems (%)
2014 - 15	41.15	95.71	0	100	100
2015 - 16	42.27	97.25	0	95	100
2016 - 17	36.07	98.11	0	100	100
2017 - 18	26.90	96.60	0	100	100
2018 - 19 ⁴	1.68	61.36	0	95	100

5.4 Operational performance

The following issues are covered within Table 5.3:

- loss of operation
- details of any unplanned or abnormal incidents that could have a long-term effect on the safety of the pipeline.

⁴ Operators were not able to identify only assets greater than 1050kPa in previous reports. This data now only includes reporting of assets greater than 1050kPa.

Table 5.3 Operational performance

Reporting period	Hours pipeline not operational	Number of “unplanned” incidents per kilometre
2014 - 15	0	0
2015 - 16	0	0
2016 - 17	0	0
2017 - 18	0	0
2018 - 19	0	0

5.5 Conclusion

Where activity was present in close vicinity to high pressure gas assets, 61.36 per cent of all activities were reported through the Dial Before You Dig system prior to works commencing. The reduction in Dial Before You Dig notifications prior to works commencing compared to previous reporting periods is an indication that the pipeline operators are being notified of activities through alternative procedures such as direct contact with contractors and proponents or based on pipeline patrols.

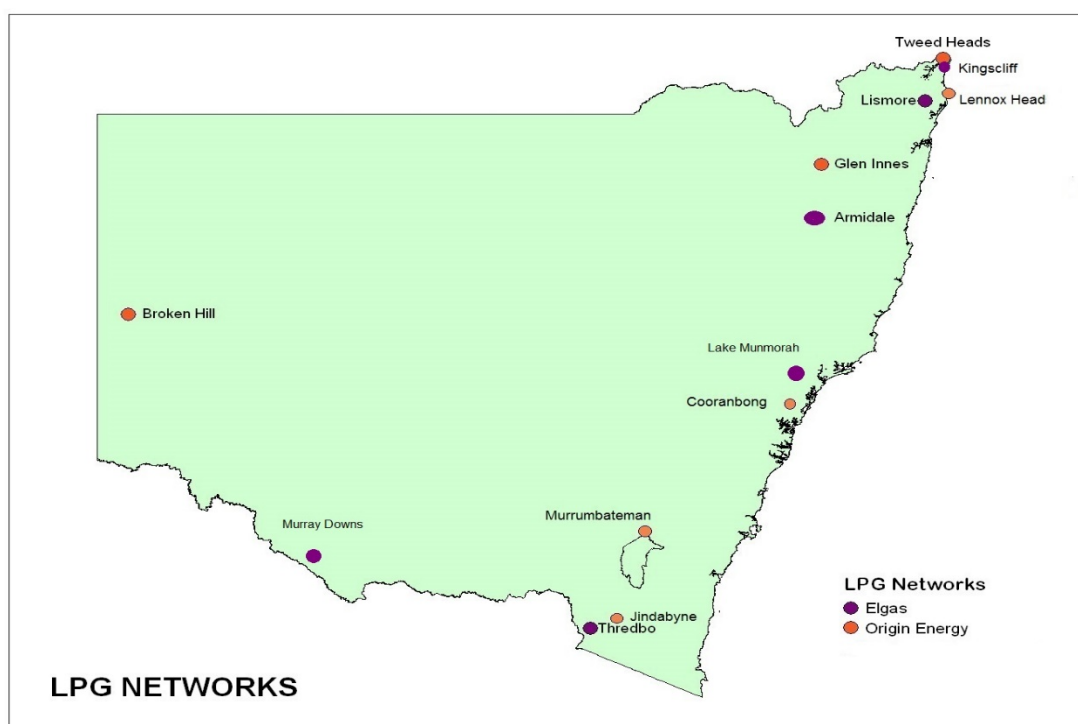
Appendix A: LPG networks in NSW and performance data

There are a number of liquefied petroleum gas (LPG) distribution systems supplying gas to consumers within NSW. LPG is transported to these sites by road and is therefore favoured for small stand-alone distribution systems.

LPG may be reticulated in several forms, such as Tempered Liquefied Petroleum Gas (TLPG), Simulated Natural Gas (SNG), Butane or as direct LPG. The significance of this, however, is that gas appliances must be approved for use with the particular type of gas being reticulated within a network.

There were two licensed distributors of LPG in NSW who reported to the Department for the 2018-19 period. The locations of these networks are illustrated in Figure A.1 below. These networks are briefly described below and network data provided by the operators is presented in this section.

Figure A.1 Location of LPG networks in NSW



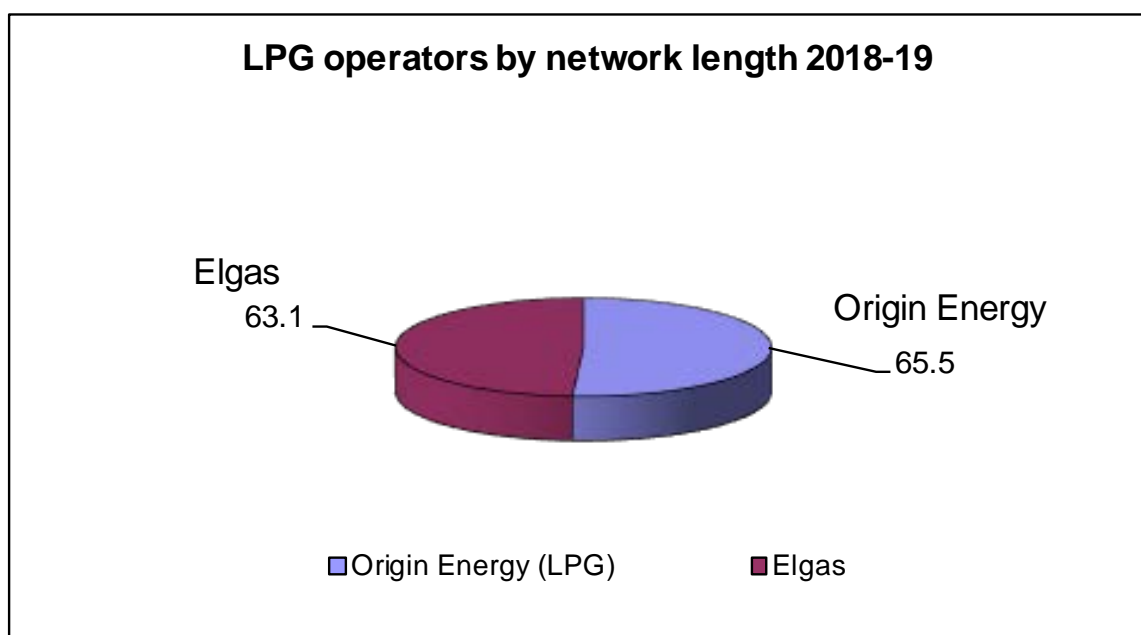
Origin Energy LPG Ltd

Origin Energy has distribution districts in Glen Innes, Broken Hill, Tweed Heads (Banora Pt.), Jindabyne, Cooranbong, Lennox Head and Murrumbateman. Origin Energy's LPG network at Glen Innes is now the largest network in NSW.

Elgas Reticulation Ltd

Elgas has 6 LPG distribution networks which are in Lismore, Thredbo, Armidale, Kingscliff, Lake Munmorah and Murray Downs.

Figure A.2 Relative sizes of LPG networks (kilometres)



LPG networks - asset information

NSW LPG distribution networks delivered 171 TJ of gas through approximately 128 kilometres of distribution pipework in the 2018–19 period. The LPG networks have increased in terms of total number of consumers, however the total network length has reduced. The reduction in network length is due to certain areas of the networks being decommissioned by the network operator.

Table A.1 Consumption information for LPG networks

Reporting period	Quantity gas entering network (TJ)	Quantity gas delivered (TJ)	Per cent unaccounted for gas (UAFG) %
2014 - 15	277	273	1.45
2015 - 16	140	140	0.59
2016 - 17	157	157	0.19
2017 - 18	118	118	0.01
2018 - 19	172	171	0.61

Chart A.1.1 Per cent unaccounted for gas (UAFG) in LPG networks

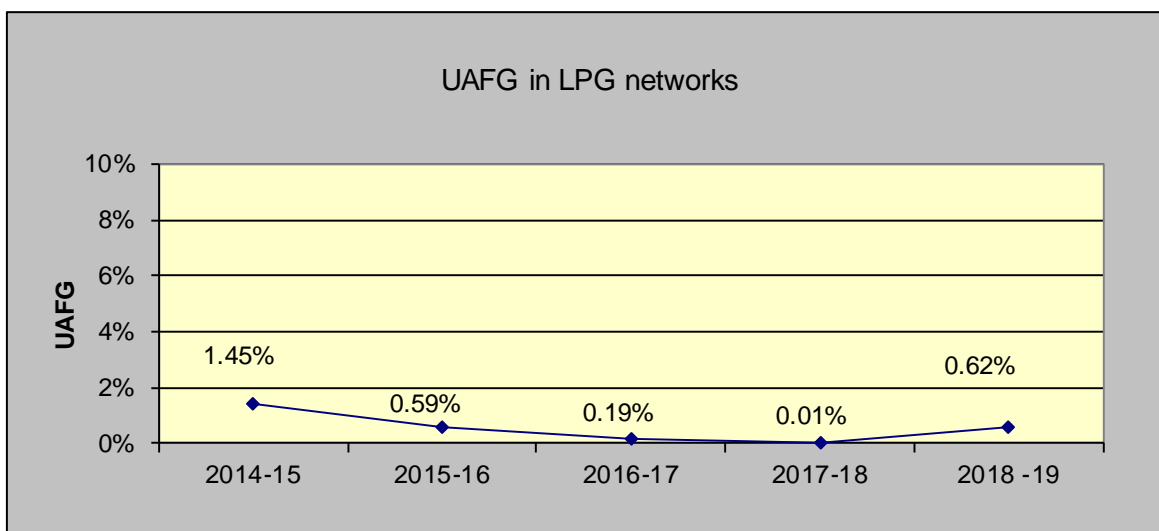


Chart A.1.2 LPG network length in NSW

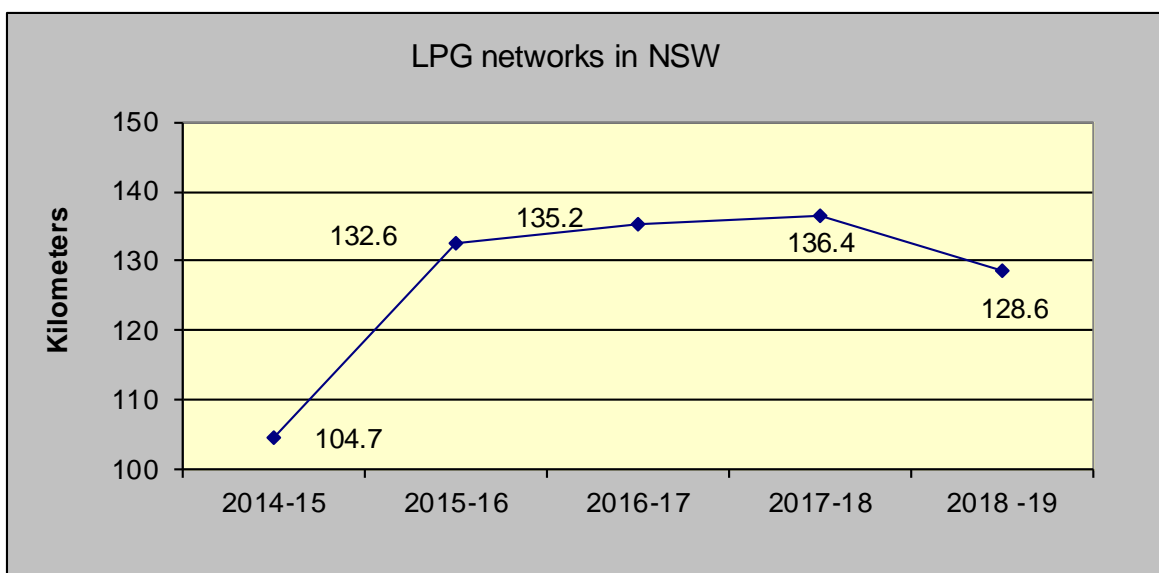


Table A.2 Consumer connection information for LPG networks

Reporting period	New consumers connected to the network	Total consumers connected to the network
2014 - 15	142	1790
2015 - 16	242	2229
2016 - 17	67	2246
2017 - 18	56	2266
2018 - 19	26	2317

Chart A.2.1 NSW LPG network consumer trend

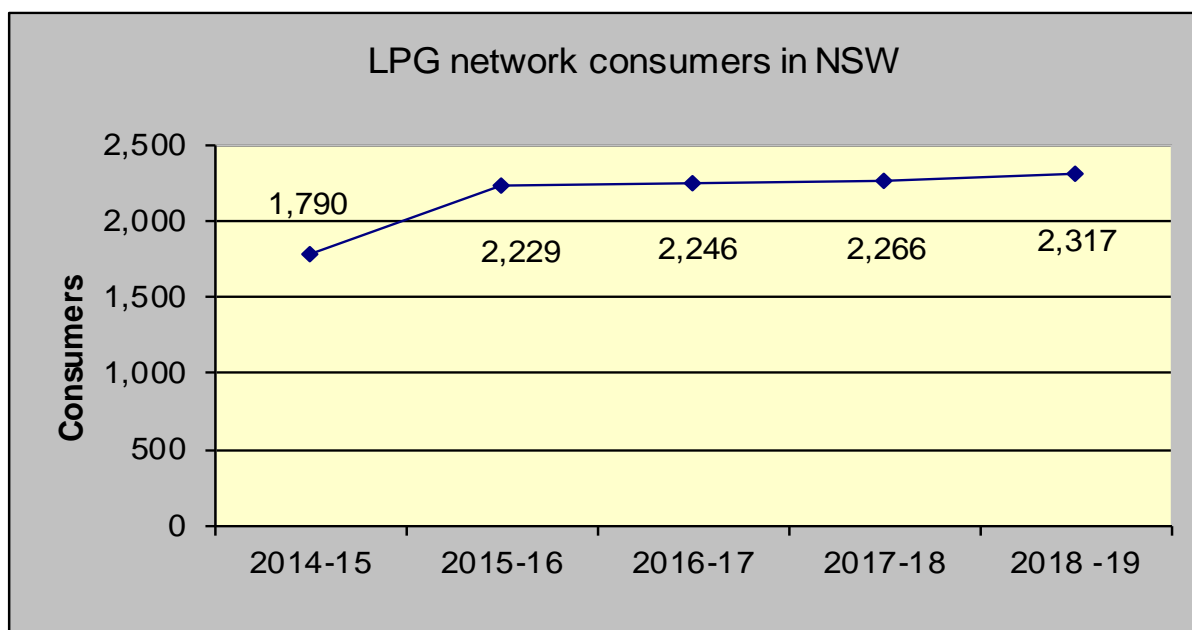
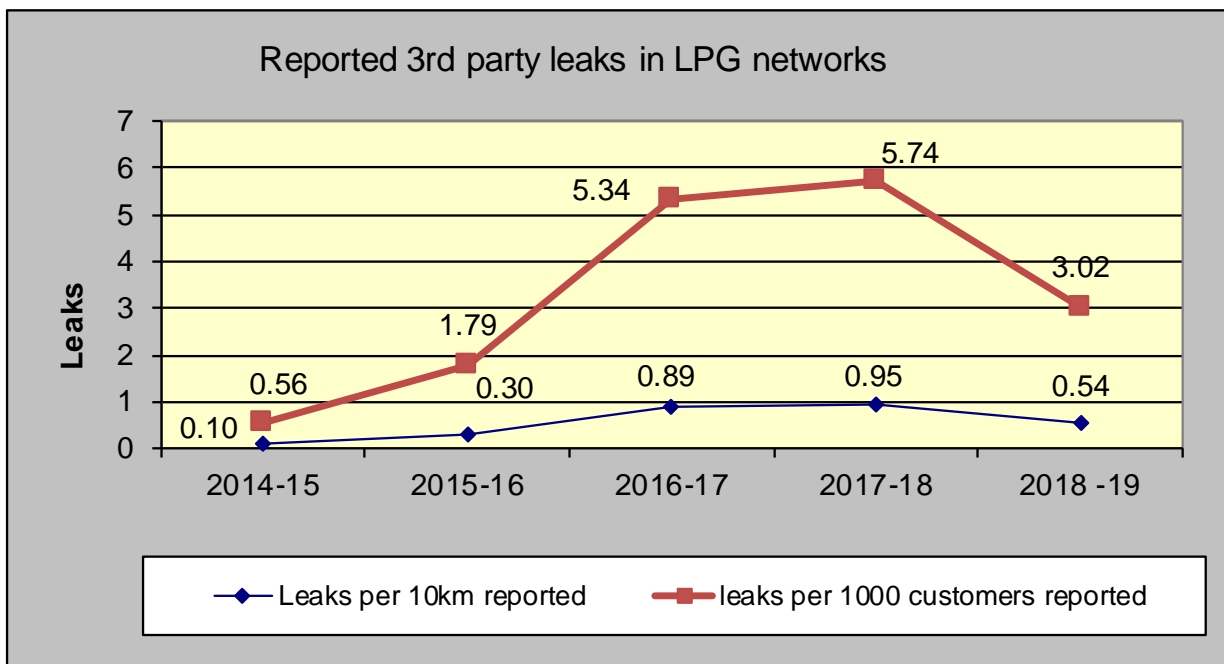


Table A.3 Network integrity and safety information LPG networks

Reporting period	Leaks per 10 km reported by third parties	Leaks per 1000 customers reported by third parties	Percent of network subject to leak surveys (%)	Leaks found per 10 km of pipe surveyed	Mechanical damage incidents per 10 km by third party	Emergency exercises conducted
2014 - 15	0.10	0.56	74.40	2.82	0.19	4
2015 - 16	0.30	1.79	25.95	1.48	0.00	2
2016 - 17	0.89	5.34	35.58	1.04	0.30	3
2017 - 18	0.95	5.74	46.11	1.43	0.07	5
2018 - 19	0.54	3.02	42.07	0.00	0.00	6

Chart A.3.1 Reported leaks by third parties in LPG networks



Conclusion

The LPG networks across NSW supply a total of approximately 2317 consumers through 128 kilometres of LPG network length. The information contained in this report suggests that the LPG network operators continue to operate their networks in a safe manner and that asset integrity is being maintained.

Due to the relatively small LPG network size compared to other networks such as natural gas networks, small fluctuations in the LPG network reporting figures can have a significant impact on KPIs. This is the main reason for recording and reporting on the LPG network data in a separate category to other gas networks.

Appendix B: Natural gas industry in NSW

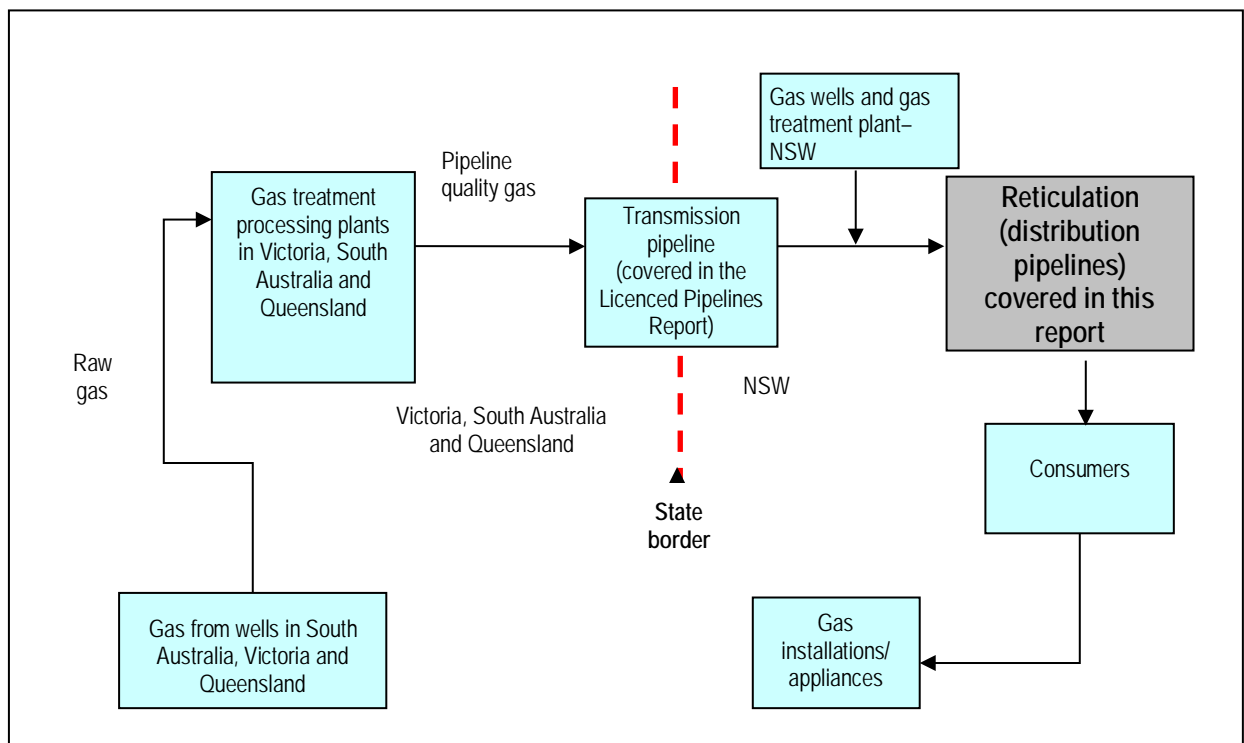
The gas distribution industry in NSW consists of authorised reticulators of natural gas and licensed distributors of LPG. The NSW gas transmission system and NSW gas retailers are not addressed in this report.

Natural gas networks

The natural gas supply chain, shown in **Figure B.1**, consists of four main discrete entities:

- gas production (covered in NSW by the Resources and Geoscience Division of the Department of Planning, Industry and Environment at 30 June 2019, from April 2020 transferred to the Division of Mining, Exploration and Geoscience in the Department of Regional NSW)
- transmission system (covered in the NSW Licensed Pipelines Performance Reports)
- distribution networks (covered in this report)
- retailers (regulated by the Australian Energy Regulator (AER)).

Figure B.1 The NSW natural gas supply chain



NSW receives gas from several regions in Queensland, and from South Australia via Moomba which is piped through a transmission pipeline from Moomba to Sydney. Gas is also supplied from the Queensland region into NSW at Tweed Heads.

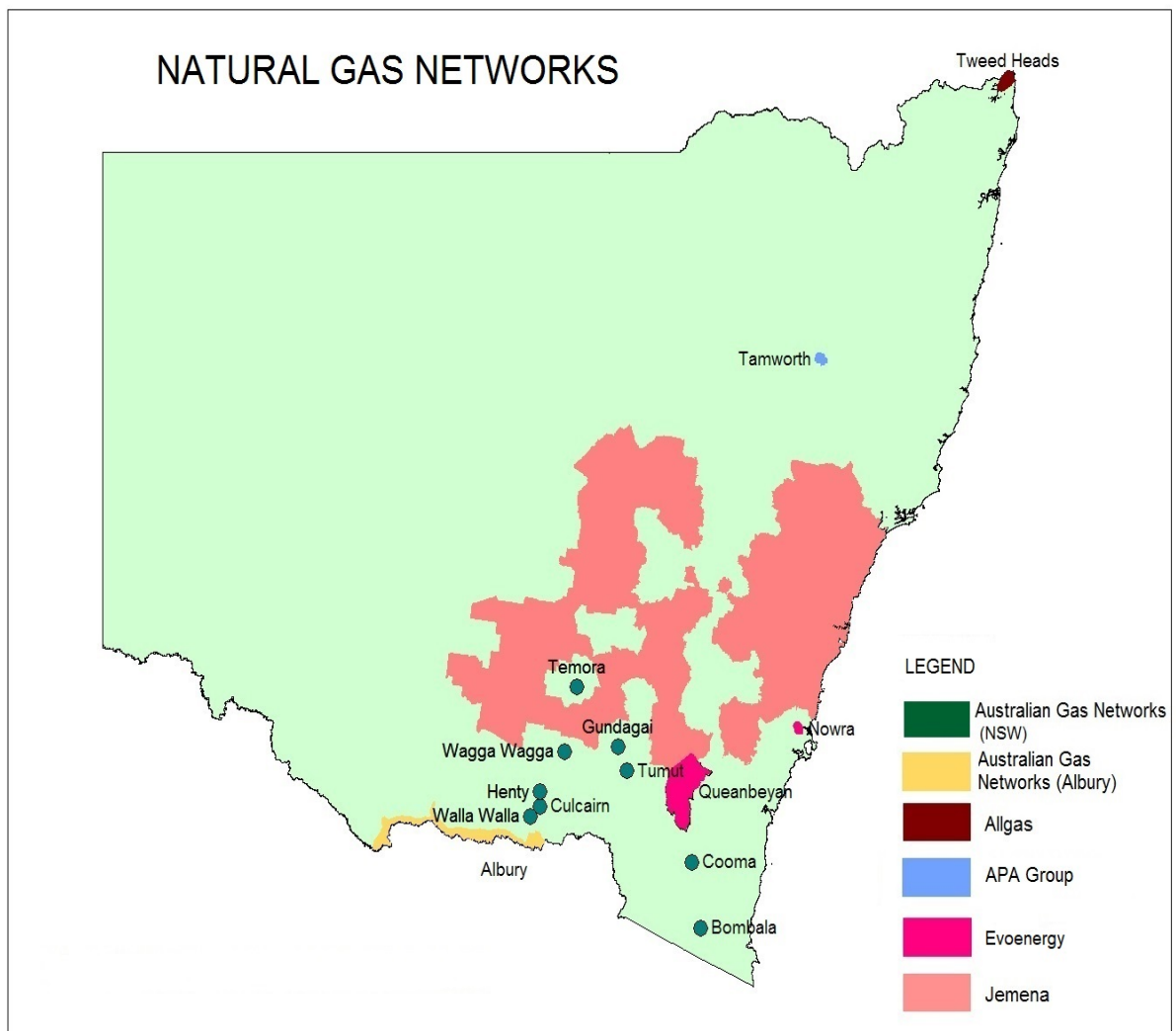
Two other sources of natural gas are transported to NSW from Victoria, via the Eastern Gas Pipeline (EGP) along the east coast from Victoria to NSW, and the Victoria to Culcairn pipeline that interconnects between Culcairn in NSW and the Victorian border. The Camden region in NSW is also another gas source.

A gas storage facility is also located at Hexham. The facility has a storage capacity of 1.5 PJ of gas. This facility enhances the gas supply in the greater Newcastle region.

The scope of this report is limited to the distribution networks. The natural gas distribution network in NSW is the conduit for the reticulation of natural gas and supply to consumers in the state. The greater NSW network is divided into smaller distribution networks and operated by authorised operators.

There were six authorised natural gas network operators in NSW during the reporting period. The locations of these networks are illustrated in **Figure B.2**. The networks are briefly described below.

Figure B.2 Location of natural gas networks in NSW



Jemena Gas Networks (NSW) Ltd

The principal reticulator of natural gas in NSW is Jemena Gas Networks (operated for and on behalf of Jemena Gas Networks by Jemena Asset Management). The Jemena Gas Network in NSW is divided into five large natural gas distribution networks:

- Jemena Sydney North
- Jemena Sydney West
- Jemena Sydney South
- Jemena Country
- Jemena Coastal

The area bounded by Palm Beach and Hornsby to the north of Sydney, Sutherland Shire, south of Bankstown and west to Lithgow is serviced by Jemena Sydney North, Jemena Sydney South and Jemena Sydney West Network respectively. This network area is large and complex in comparison to regional networks. The Jemena Coastal Network broadly services the Hunter, Newcastle, Central Coast and Illawarra regions, and the Jemena Country Network services a large area in central NSW including the Southern Highlands, Central Tablelands, Central West, Riverina and South-West Slopes regions.

Jemena Gas Networks also owns natural gas transmission assets in NSW.

Evoenergy Distribution (Former ActewAGL)

The Evoenergy gas distribution network is also operated by Jemena Asset Management (on behalf of the Evoenergy Distribution Partnership). The Evoenergy Distribution Partnership comprises of Jemena ATA Pty Ltd and the ACT Government owned ACTEW Corporation. Evoenergy has two networks in NSW: one located at Queanbeyan/Bungendore and another at Nowra. Evoenergy also has a substantial network in the ACT region.

Australian Gas Networks Ltd

Australian Gas Networks Ltd holds two Natural Gas Reticulator Authorisations in NSW, one for The Australian Gas Networks (Albury) Ltd and one for Australian Gas Networks (NSW) Pty Ltd.

The Australian Gas Networks (Albury) Ltd network supplies Albury, Thurgoona, Lavington, Jindera, Howlong, Moama, Tocumwal, Finley, Barooga, Mulwala and Corowa areas.

The Australian Gas Networks (NSW) Pty Ltd network supplies Bombala, Cooma, Culcairn, Gundagat, Henty, Tamara, Tumut, Wagga Wagga and Walla Walla areas.

APA Group

APA Group operates two gas distribution systems in NSW: the Central Ranges Pipeline Pty Ltd (APA Group) and APT Allgas Energy Pty Ltd.

The Central Ranges Pipeline Pty Ltd services the gas network in the Tamworth distribution district area.

The APT Allgas Energy Pty Ltd (Allgas) is also owned by APA Group. Allgas has one distribution district in NSW, which includes the local government area of Tweed Heads and has significant Queensland gas operations.

Appendix C: Definitions

These definitions are included in or derived from the [NSW Gas Networks Reporting guidelines 2017](#).

Cathodic Protection (CP) - the pipeline may be protected from corrosion (including stray currents) by a CP system. Should the CP system not fully protect the pipeline, the pipeline may suffer corrosion which can become a contributing factor to a LOC.

Coating defects - the coating is an important part of the pipeline to help prevent corrosion occurring. If the coating is badly damaged this will affect the performance of the CP in operating correctly.

Details of any unplanned or abnormal incidents that could have a long term effect on the safety of the pipeline - the pipeline is designed to operate within certain parameters which includes pressure and temperature. Operating the pipeline outside of these conditions can affect the long term life of the pipeline.

Field Inspections - periodically the pipeline and easement will be inspected to ensure that any existing known pipeline defects have not re-occurred or existing defects progressed.

Ignitions - when the LOC event also ignites. Ignitions are the most hazardous event which can occur on a pressure pipeline. This data allows for clear understanding of how often LOC events ignite.

Incident - any third party activity where contact is made with the pipeline, whether or not the pipeline suffers a loss of containment or damage. Identification of incidents that occur after the Operator became aware of the activity provides an indication on the effectiveness of the Operator's management measures.

Injuries or property damage involving the pipeline - when a person is injured or property is damaged and the pipeline has played a part in the incident occurring. This provides an indication of the consequence of any hazardous event.

Injuries or property damage involving the pipeline - when a person is injured or property is damaged and the pipeline or the pipelines easement area has played a part in the incident occurring. This provides an indication of the consequence of any hazardous event.

Integrity Assessment - AS 2885 requires three primary reviews with respect to pipeline integrity to be conducted at intervals not exceeding 5 years:

- Review of Maximum Allowable Operating Pressure (MAOP);
- Review of Location Class; and
- Review of Risk Assessment.

Loss of Containment (LOC) - uncontrolled escape of any substance from the pipeline. The number of LOC events is the prime indicator of the effectiveness of the Operator's Safety Management System.

Loss of Operations - when the pipeline, or part thereof, becomes non operational due to circumstances that are unplanned.

Pipeline Patrols - personnel monitor the pipeline easement to maintain the condition and safety of the pipeline by preventing uncontrolled / unauthorised activity.

Supervised Activity around the Pipeline - third party construction work is regularly performed near the vicinity of the pipeline that requires monitoring to make sure the pipeline is not damaged during such occasions. Third party damage is the most common cause of pipeline LOC events.

Unaccounted-for-Gas (UAFG) is calculated based on the amount of gas entering the network compared to the amount of gas being delivered to consumers.