

NSW 2022-2023 Gas Networks Performance Report

10 October 2024

Acknowledgement of Country



Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

NSW 2022-2023 Gas Networks Performance Report

Published by NSW Department of Climate Change, Energy, the Environment and Water

www.energy.nsw.gov.au

First published: October 2024

ISBN/ISSN: 1838-8345

More information

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1 Executive Summary

This *NSW 2022–23 gas networks performance report* on the operations of natural gas and liquefied petroleum gas (LPG) distribution networks in New South Wales (NSW) has been prepared by the Division of Energy and Climate Change in the NSW Department of Climate Change, Energy the Environment and Water (the DCCEEW).

These networks are regulated under the *Gas Supply Act 1996* (the Act) and the Gas Supply (Safety and Network Management) Regulation 2022 (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 DCCEEW. 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 (KPIs) have been developed by the DCCEEW 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.

1.1 Natural gas networks

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

The DCCEEW acknowledges that the network operators are continually looking at ways to improve their performance, in accordance with the Regulation, and the DCCEEW 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 collected and reported.

1.2 High-pressure pipelines (unlicensed)

Jemena Gas Networks (NSW) Ltd, Evoenergy and Australian Gas Networks (Albury) operate high-pressure unlicensed pipelines (pressure greater than 1,050 kPa) as part of their natural gas networks.

1.3 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 DCCEEW continues to consult with LPG network operators to improve the LPG reporting regimes while taking into account the unique characteristics of the LPG networks.

1.4 Key findings

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

Summary of KPIs for the 2022–23 reporting period:

- The size of the NSW gas network has increased to 29,173 kilometres. This is an increase of approximately 321 kilometres.
- The number of consumers connected to natural gas in NSW has risen to over 1.6 million over the period.
- The number of new consumers has continued to grow, with this reporting period recording 27,184 new connections. However, with the new connection methods for high density with only one meter connected for the Strata the actual number of customers connected is not fully shown now with this number. This area will need to be reviewed going forward.
- The unaccounted for gas (UAFG) figure for NSW remains within the 2–3% range at 2.8%.
- The LPG networks have reported maintaining their asset length with a small decline of connections. The assets have also continued to indicate integrity with a low UAFG of 0.6%.

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

This report does indicate some reduction in figures. However, it should be noted Covid 19 was affecting aspects within this report.

2 Introduction

This report consolidates performance information and data provided by each of the gas distribution network operators for the 2022–23 financial year in accordance with the reporting requirements outlined in the *NSW gas networks performance reporting guidelines* (DPE 2017).

This report:

- Presents the DCCEEW’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.

2.1 Report structure

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

- Introduction
- Network asset information
- Network integrity and safety information – this chapter also presents key performance indicators (KPIs), derived from the data provided
- Network reliability and consumer-related matters – this chapter also presents KPIs, derived from the data provided
- 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.

2.2 Limitations of this report

There are currently 8 gas network operators in NSW. Six of these operators reticulate natural gas, while the remaining 2 operate distribution systems that reticulate LPG and 1 existing network operator also obtained a licence to reticulate hydrogen. All 8 gas network operators are regulated by the DCCEEW under the *NSW Gas Supply Act 1996* (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 the 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. Pipelines licensed under the Pipelines Act are not covered in this report (please refer to the *NSW 2022–23 licensed pipelines performance report* [DCCEEW 2022]).

The DCCEEW recognises the efforts made by the network operators on improving the quality of information, data and reporting provided. Where possible, the DCCEEW 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.

2.3 Abbreviations

Abbreviation	Term
The Act	The NSW <i>Gas Supply Act 1996</i>
DCCEEW	NSW Department of Climate Change, Energy the Environment and Water
GJ	Gigajoule
kPa	Kilopascal: pressure units
KPI	Key performance indicator
LPG	Liquefied petroleum gas
MAOP	Maximum allowable operating pressure
MJ	Megajoule
PJ	Petajoule
The Regulation	The NSW Gas Supply (Safety and Network Management) Regulation 2022
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)

2.4 Gas Units of measure

A joule is the international unit for measuring energy content.

- 1,000 joules (J) = 1 kilojoule (kJ)
- 1,000 kilojoules = 1 megajoule (MJ)
- 1,000 megajoules = 1 gigajoule (GJ)
- 1,000 gigajoules = 1 terajoule (TJ)
- 1,000 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.

3 Network asset information

3.1 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 kPa)¹, see Figure 1
- total quantity of gas entering the network
- quantity of gas delivered to custody transfer points
- new regions connected to gas supply networks.

These summary statistics are shown below in Table 1.

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.

3.2 Key performance indicators

The KPIs adopted by the DCCEEW for monitoring accuracy of network information is:

- Unaccounted for gas (UAFG).

3.3 Natural gas networks – asset information

In 2022–23 the length of the natural gas network increased by 321 kilometres, with a total length of 29,173 kilometres as shown in Figure 1. Gas delivered from the network in 2022–23 was approximately 104.2 PJ or about 2.76 billion standard cubic metres of gas to consumers in NSW.

Table 1. Natural gas networks in NSW: summary statistics

Reporting period	Network growth in NSW (km)	Gas entering the network (PJ)	Gas delivered (PJ)	Percentage unaccounted for gas (UAFG)
2018–19	-1,787*	105.4	102.5	2.77%
2019–20	301	108.5	105.4	2.85%
2020–21	354	103.3	100.3	2.94%
2021-22	291	102.6	99.7	2.90%
2022-23	321	104.2	101.3	2.81%

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

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

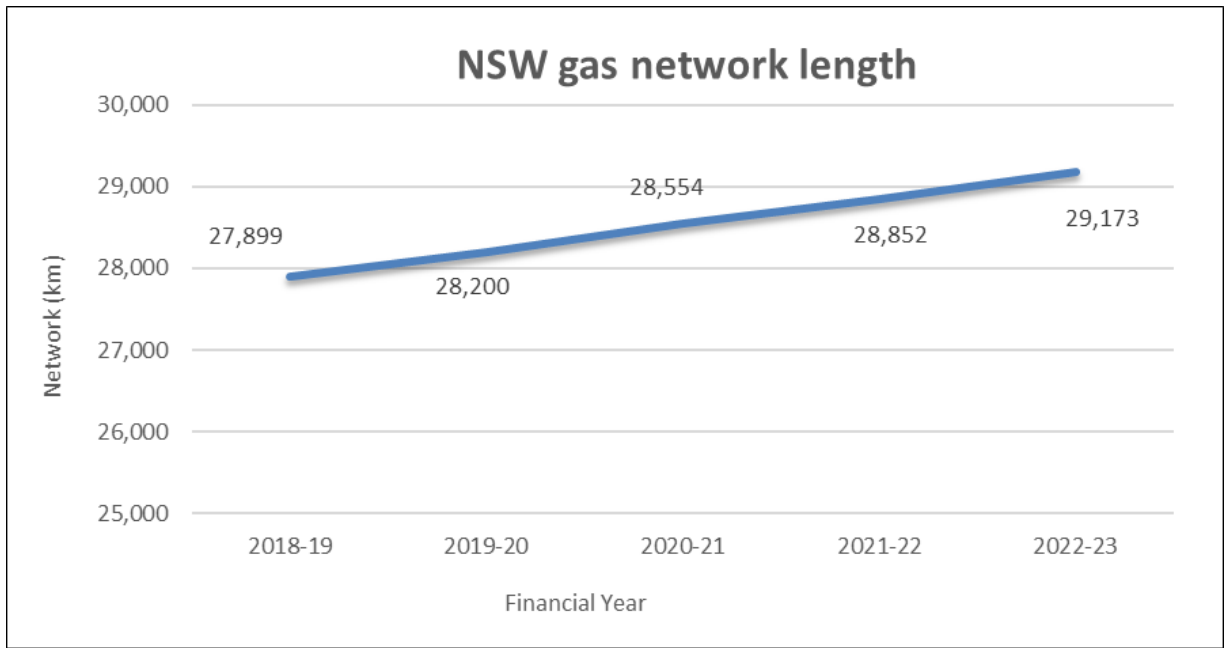


Figure 1: NSW gas network length

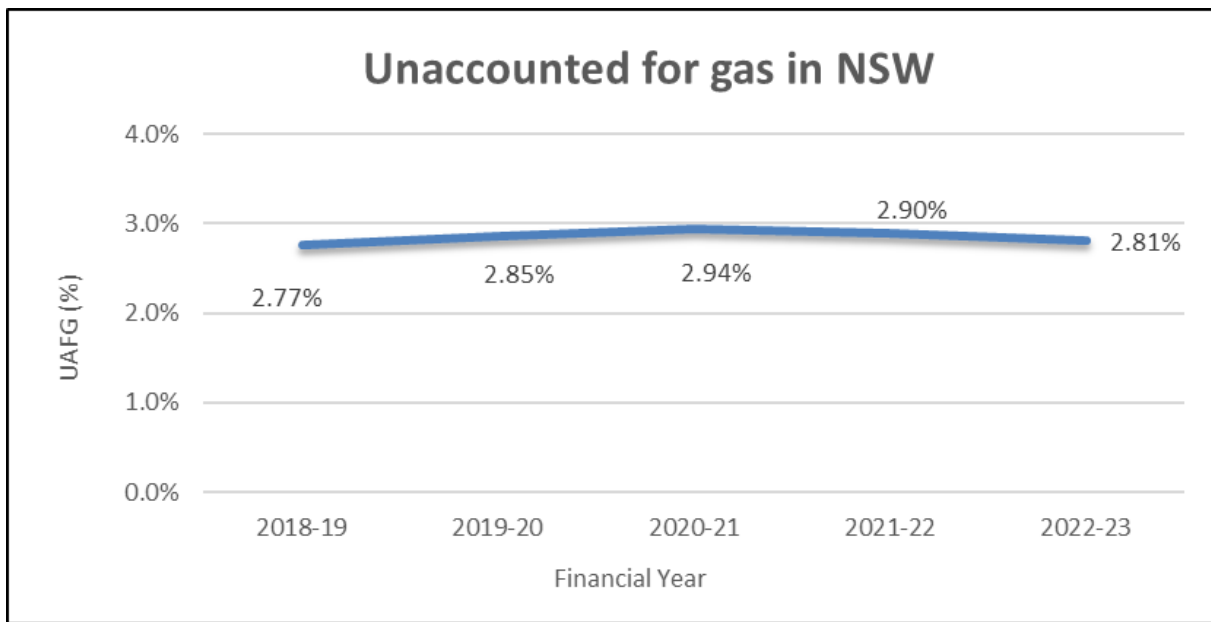


Figure 2: Percentage unaccounted for gas (UAFG) trend in NSW

The UAFG data (see Figure 2) 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 2022–23 period was 2.8% which is within metering error allowances of 2–3%.

The reported growth of gas network length in NSW (see Figure 3) declined in 2018–19 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 growth 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. The networks have increased by 321 kilometres during the 2022–23 period.

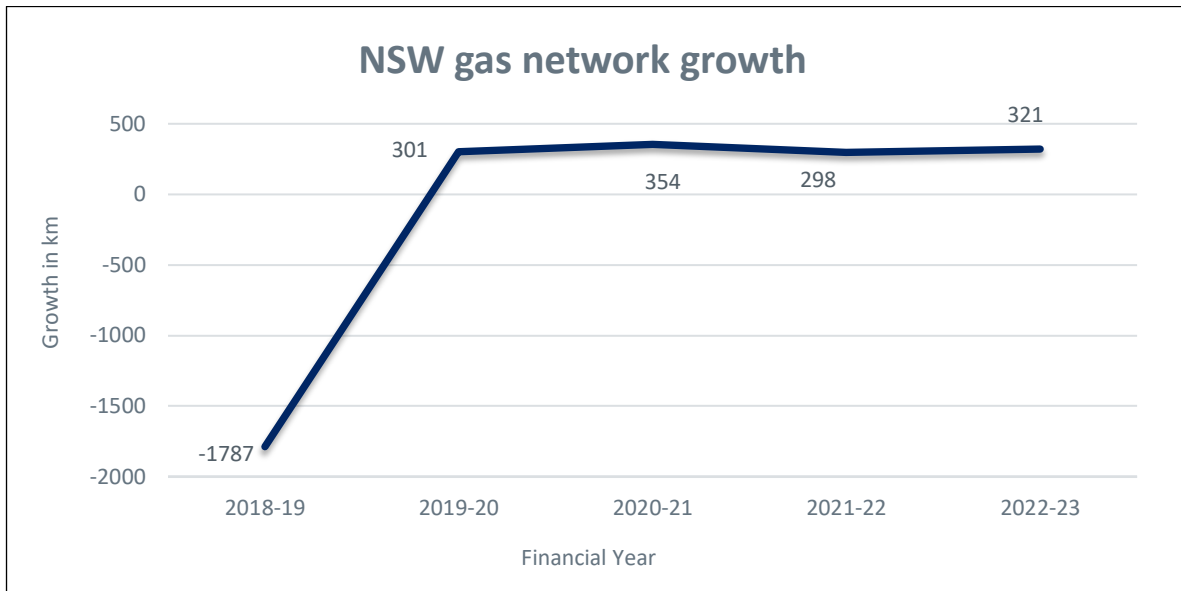


Figure 3: Gas network length growth

3.3.1 New regions

No new regions have been reticulated during the 2022–23 reporting period, therefore consumer growth has been occurring within existing networks areas.

3.4 Conclusion

The total length of the gas networks in NSW increased by 321 kilometres in the reporting period. The overall length of the NSW gas networks is currently 29,173 kilometres.

The amount of UAFG has been reported at 2.8% of gas entering the system. This is a measure of how secure the gas network is and is within metering error allowances.

4 Network integrity and safety information

4.1 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 affects 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 (Before You Dig) received about work near networks.

4.2 Key performance indicators

The KPIs adopted by the DCCEEW for monitoring network integrity and safety include:

- leak surveys as a percentage of total pipe length, see Table 2 and Figure 4
- leaks found per 10 kilometres of pipe surveyed, see Table 2 and Figure 4
- mechanical damage incidents per 10 kilometres of pipe, see Table 2 and Figure 5
- gas leaks per 10 kilometres of pipe reported by third parties, see Figure 6
- gas leaks per 1,000 customers as reported by third parties, see Figure 6
- mechanical damage incidents per 1,000 consumers, see Table 2
- number of emergency exercises, see Table 2.

Table 2. 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 1,000 consumers	Emergency exercises
2018 – 19	20.33%	6.24	0.92	1.72	1
2019 – 20	23.84%	1.01	0.85	1.55	4
2020 – 21	17.43%	0.32	0.81	1.46	3
2021 – 22	12.07%	0.62	0.72	1.30	2
2022 – 23	16.31%	0.28	0.75	1.34	1

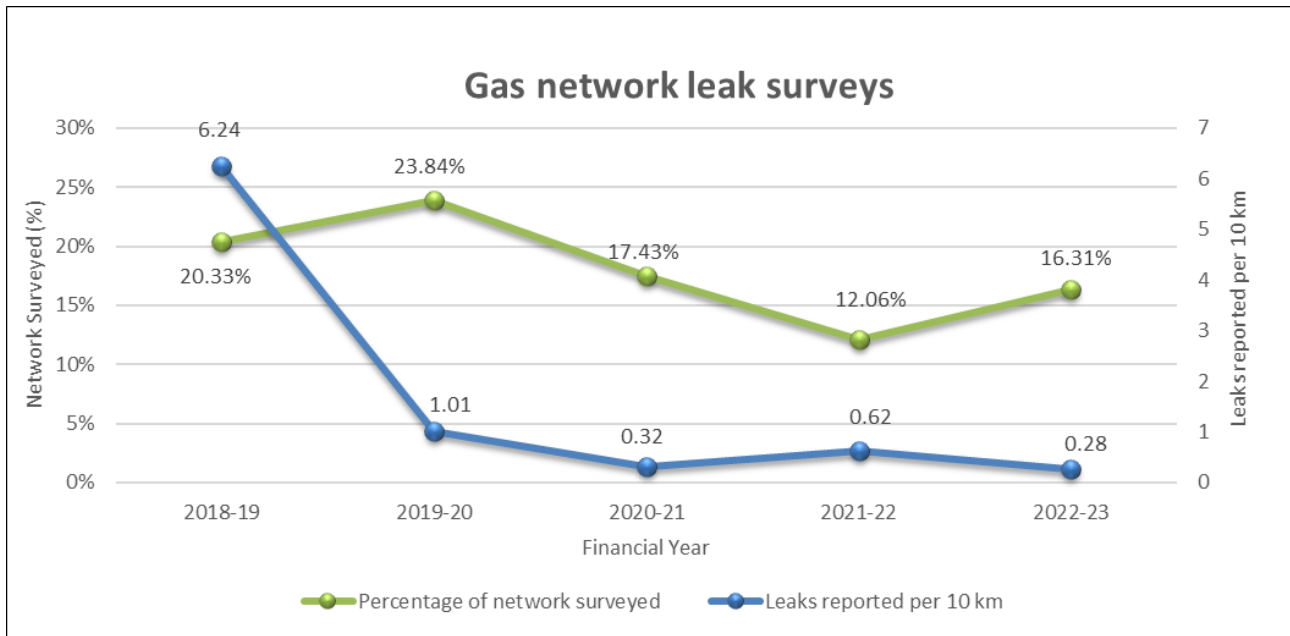


Figure 4: Gas network leak survey and reporting

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.

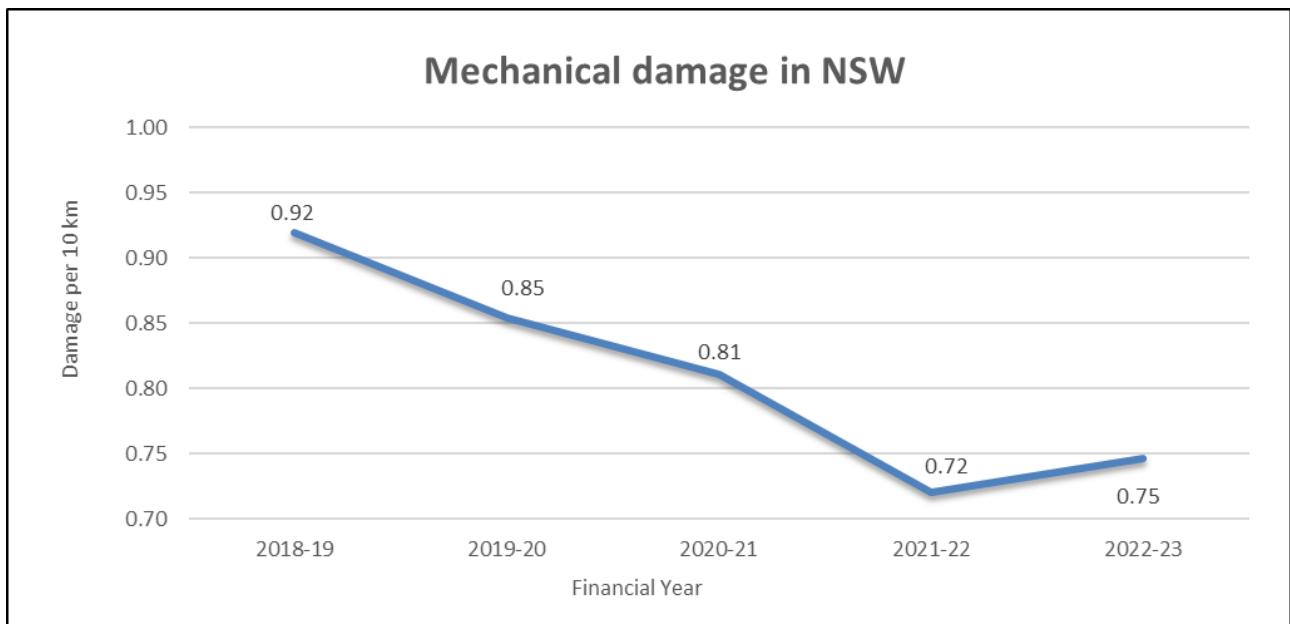


Figure 5: Reported mechanical damage per 10 kilometres on gas networks

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 Before You Dig Australia (BYDA) before work occurred in the area of concern. The mechanical damage per 10 km of gas network assets has been less than 1 over the last 5 reporting periods.

The Gas Supply Act has a legislated requirement that a BYDA must be conducted before any excavation works occur.

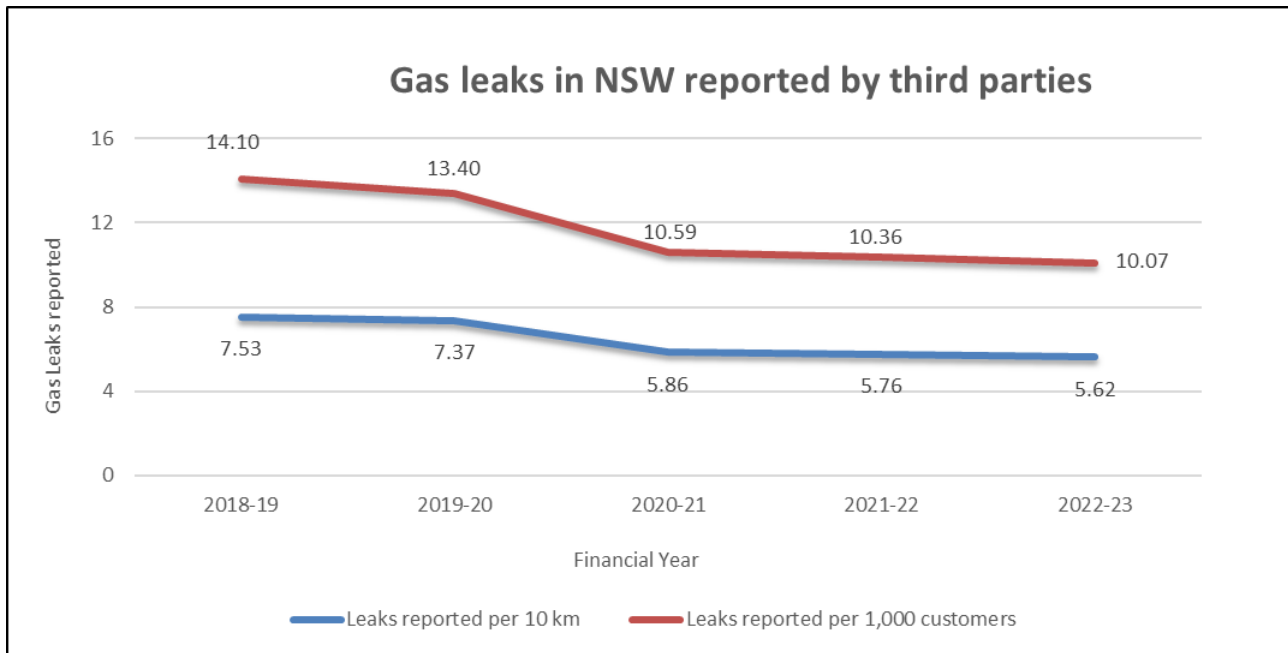


Figure 6: Gas leaks reported by third parties

Reported gas leaks by third parties provides an indication of locations that have leaking assets and any areas that may require rectification works. This is the lowest third-party reported leaks in the last 5 reporting periods.

4.2.1 Natural gas – networks surveys

It is not a requirement for operators to survey their entire gas networks annually. Gas network operators should, however, survey 100% of their network within a span of 5 years. The total amount of the gas network that was surveyed in the 2022–23 period was reported at 16.31%.

4.3 Conclusion

The gas network operators have been working with third-party contractors to reduce impacts on their gas networks. The Gas Supply Act requires a proponent to contact BYDA before excavation work can occur. The number of ‘one-call’ contacts made to network operators due to the legislative requirement has increased from approximately 70,000 to over 500,000 annually. The reporting period recorded over 544,000 ‘one-call’ contacts.

The number of gas leaks reported per 10 kilometres and per 1,000 customers has reduced in the 2022–23 reporting period, which may reflect the asset integrity. Mechanical damage of gas networks has slightly increased, which correlates with the increase in activity of NSW construction and infrastructure projects since Covid-19.

5 Network reliability and consumer-related matters

5.1 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), see Figure 7
- number of new consumers connected to the network (total number), see Figure 8
- loss of supply (duration, total unplanned consumer hours lost – 5 or more customers), see Table 3 and Figure 9
- loss of supply (number, total unplanned numbers of loss of supply instances – 5 or more customers), see Table 3 and Figure 9
- poor supply pressure (total number of instances)
- odorant levels not to specification (total number of instances), see Table 3
- number of incidents or emergencies responded to, see Table 3 and Figure 10
- incidents or emergency responses within 60 minutes of notification (total number), see Table 3 and Figure 11.

5.2 Key performance indicators

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

- loss of supply (total unplanned consumer hours lost – 5 or more customers) per 1,000 customers), see Table 3 and Figure 9
- percentage of calls responded to within 60 minutes, see Table 3 and Figure 11.

Table 3. Reliability and consumer-related measures

Reporting period	Unplanned consumer hours lost per 1,000 consumers	Unplanned loss of supply incidents per 1,000 km	Number of out of spec. gas or odorant levels reports	Number of incidents/emergencies per 1,000 consumers	Percentage incidents/emergencies responded to within 60 minutes
2018 – 19	35.36	1.68	0	1.83	99.05%
2019 – 20	79.64	1.56	0	1.59	99.07%
2020 – 21	15.74	1.26	0	1.52	98.54%
2021 – 22	26.07	0.70	3	1.40	98.40%
2022 – 23	2,091*	1.20	0	1.41	98.56%

*Note NSW had a major outage on the gas network in the Bathurst and Lithgow area due to an incident with a licenced pipeline. Due to this incident the networks were affected, and supply was off for an extended duration and the networks were required to be recommissioned. The network operator reconnected all customers in a safe, competent and effective manner limiting the time off supply.

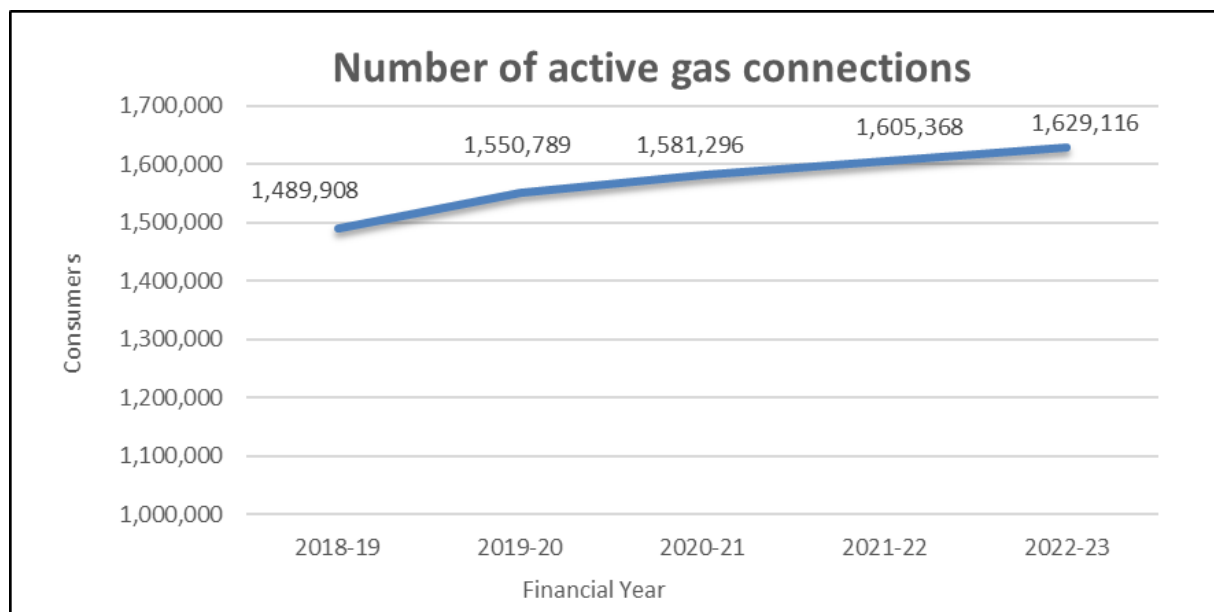


Figure 7: Active gas connection trend

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

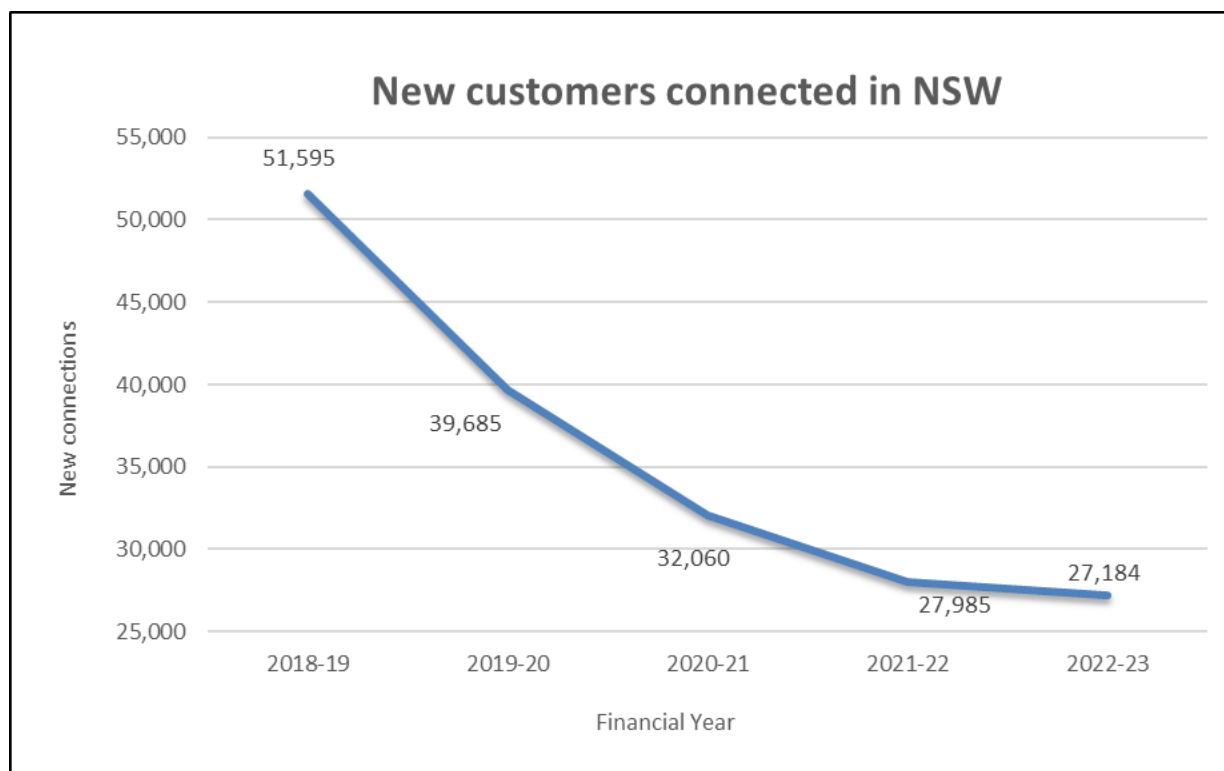


Figure 8: New customer connection trend

This information needs to be reviewed as a major source of new connection has been through the high rise development.

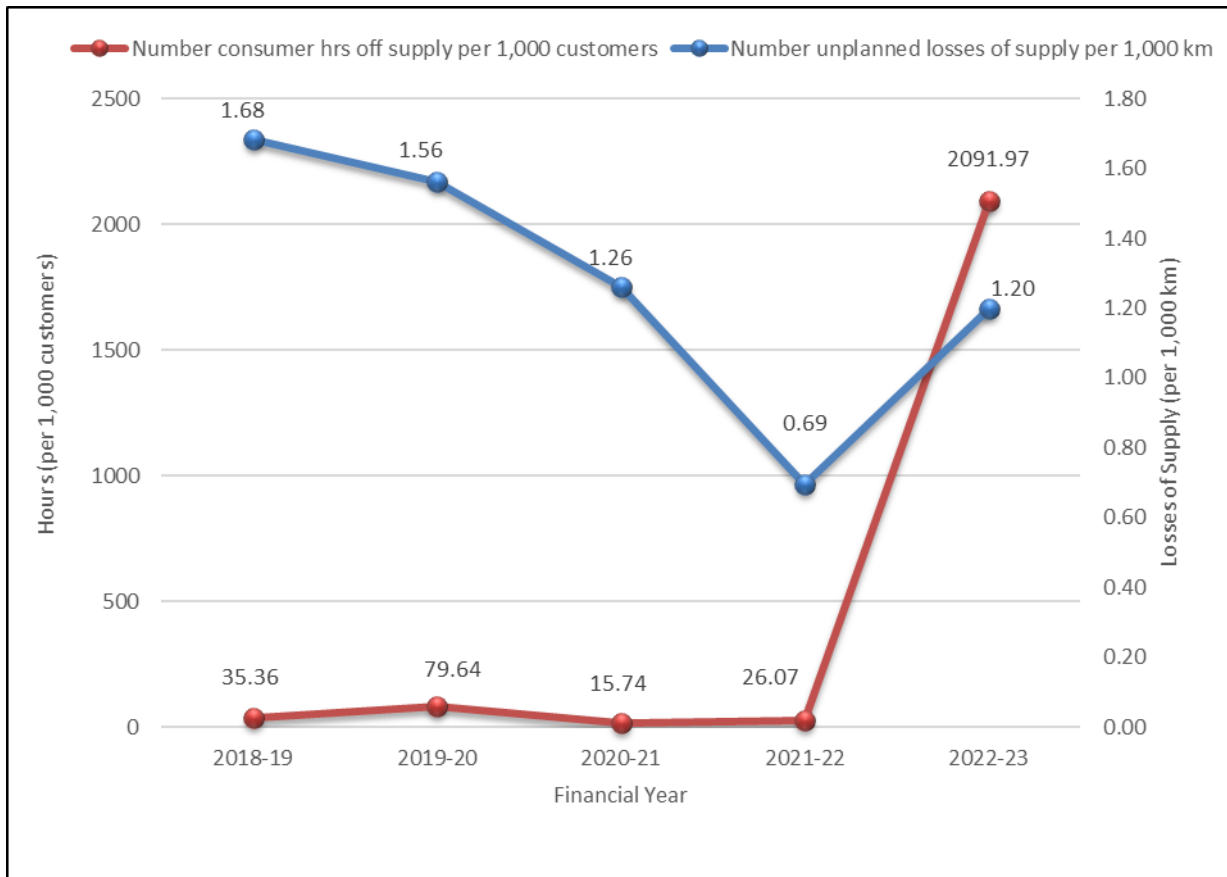


Figure 9: Consumers off supply trend

Figure 9 indicates how often the gas network has lost supply and the time required to re-establish supply to a consumer.

In the 2022–23 reporting period there was a major incident with a licence pipeline that caused a supply outage in the Bathurst and Lithgow area. This incident required the networks to be recommissioned to safely restore supply to the area.

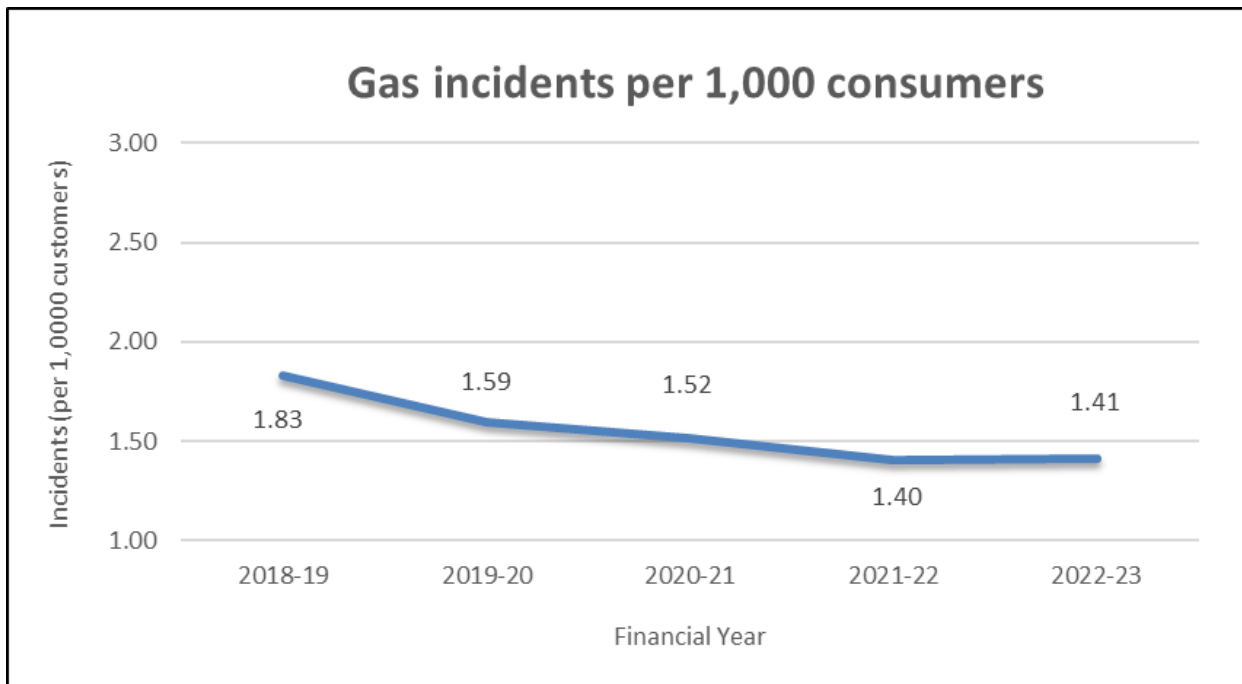


Figure 10: Reported gas incidents per 1,000 consumers

Figure 10 illustrates the trend of the number of incidents per every 1,000 consumers.

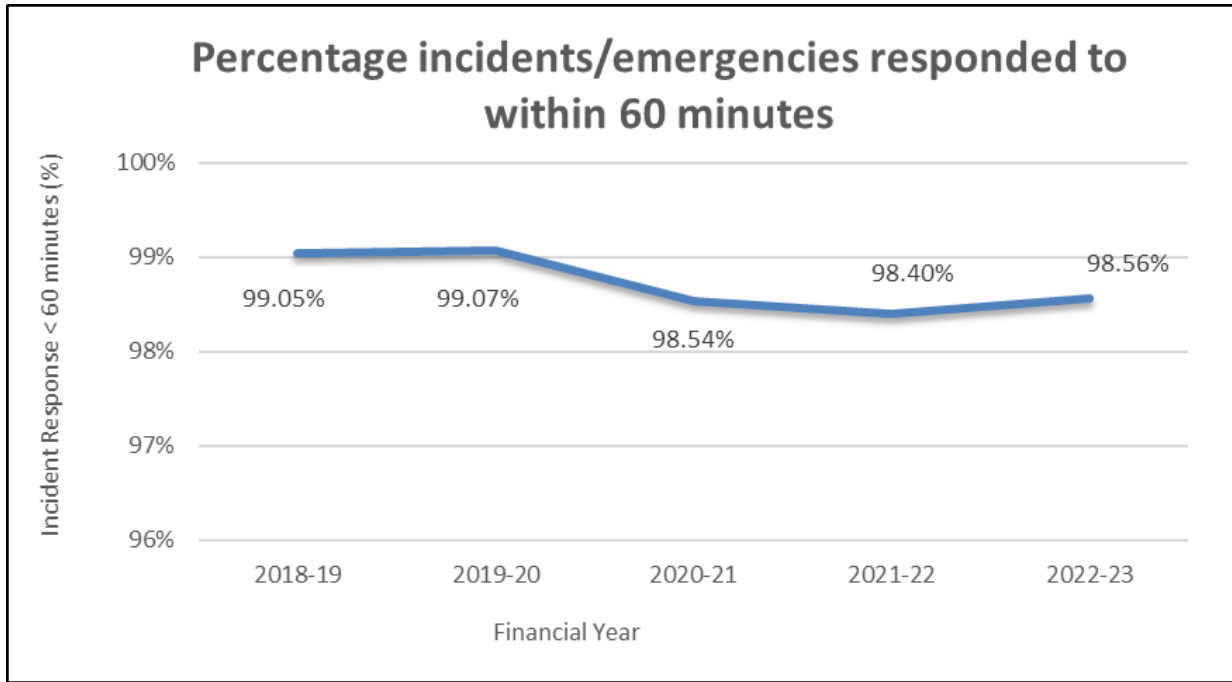


Figure 11: Percentage emergency responses within a 60-minute timeframe

Incident response data (Figure 11) provides an indication of the ability of gas network personnel to respond to an incident within one hour.

5.3 Conclusion

The number of consumers connected to gas networks has increased to over 1.62 million. The natural gas networks have connected over 27,000 consumers but this has been decreasing during each of the last 5 reporting periods.

The number of hours of loss of gas supply has increased in the 2022–23 reporting period due to a major licenced pipeline incident.

The response times to emergencies and incidents remain acceptable, with over 98% of incidents being responded to within 60 minutes in the 2022–23 reporting period.

6 High-pressure (unlicensed) pipeline activities

6.1 General

Jemena (Sydney), Jemena (Coastal), Evoenergy, and Australian Gas Networks (Albury) operate high-pressure pipelines (greater than 1,050 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 DCCEEW's annual reporting requirements request the following information:

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

NSW has approximately 179 kilometres of mains operating in the network that are running at pressures above 1,050 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.

6.2 Accidents, escapes and ignitions

The following issues are reported in Table 4:

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

Table 4. Accidents, escapes and ignitions

Reporting period	Incidents	Loss of containment	Ignitions	Injuries	Damage
2018–19	0	0	0	0	0
2019–20	8	0	0	0	0
2020–21	0	0	0	0	0
2021–22	0	0	0	0	0
2022 – 23	2	0	0	0	0

6.3 Integrity assessment and monitoring

The following issues are reported in Table 5:

- integrity assessment

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

Table 5. Integrity assessment and monitoring

Reporting period	Supervised activities per km	Percentage activities that contacted operator by (Dial) Before You Dig	Defects requiring repair per 1,000 km	Percentage CP units operating correctly	Percentage pipeline covered by CP systems
2018–19	1.68	61.36%	0	95%	100%
2019–20	2.85	85.32%	0	90%	100%
2020–21	2.66	74.98%	0	95%	100%
2021–22	2.55	85.53%	0	99%	100%
2022-23	2.56	96.95%	0	94%	100%

6.4 Operational performance

The following issues are reported in Table 6:

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

Table 6. Operational performance

Reporting period	Hours pipeline not operational	Number of 'unplanned' incidents per km
2018–19	0	0
2019–20	0	0
2020–21	0	0
2021–22	0	0
2022-23	0	0

6.5 Conclusion

Where activity was present in close vicinity to high-pressure gas assets, 96.95% of all activities were reported through the Before You Dig system prior to works commencing. The reduction in 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.

7 Appendices

7.1 Appendix A. LPG networks in NSW and networks' performance data

There are a number of liquefied petroleum gas (LPG) distribution systems supplying gas to consumers in NSW. LPG is transported to these sites by road or directly from LPG storage facilities and is therefore favoured for small, standalone distribution systems.

LPG may be reticulated in several forms, such as, 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 2 licensed distributors of LPG in NSW (Elgas and Origin Energy) who reported to the OECC for the 2021–22 period. The locations of these networks are illustrated in Figure 12. These networks are briefly described below, and network data provided by the operators is presented in this appendix.



Figure 12: Location of LPG networks in NSW

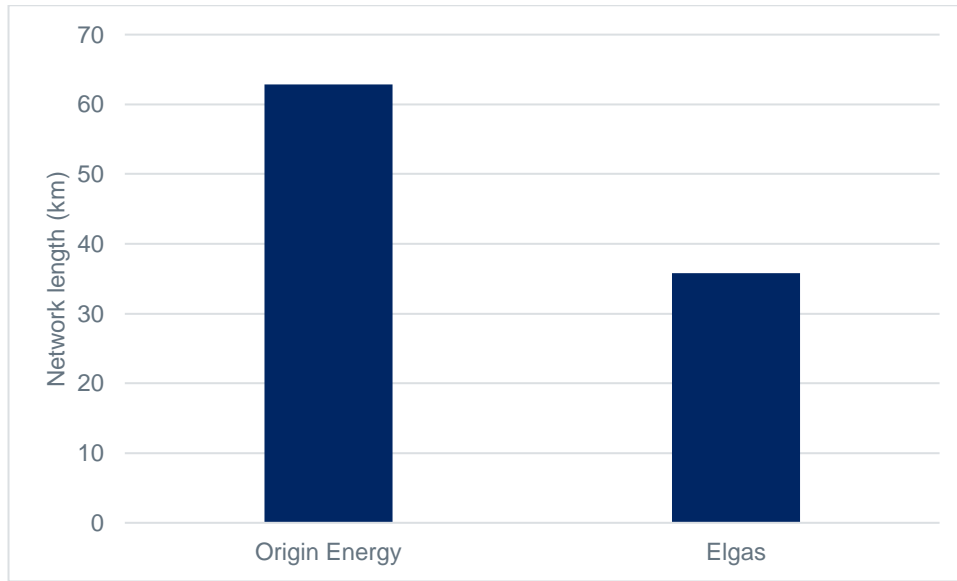
Origin Energy LPG Ltd

Origin Energy has distribution districts in Glen Innes, Broken Hill, Tweed Heads (Banora Point), Jindabyne, Cooranbong, Lennox Head and Murrumbateman.

Elgas Reticulation Ltd

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

Figure 13. Relative sizes of LPG networks (kilometres)



LPG networks – asset information

NSW LPG distribution networks delivered approximately 178 TJ of gas through 99 kilometres of distribution pipework in the 2022–23 period (Table 7). The LPG networks have remained fairly constant over the reporting period.

Table 7. Consumption information for LPG networks

Reporting period	Quantity gas entering network (TJ)	Quantity gas delivered (TJ)	Percentage unaccounted for gas (UAFG)
2018–19	172	171	0.61%
2019–20	145	144	0.41%
2020–21	131	130	0.56%
2021–22	161	161	0.19%
2022-23	178	177	0.61%

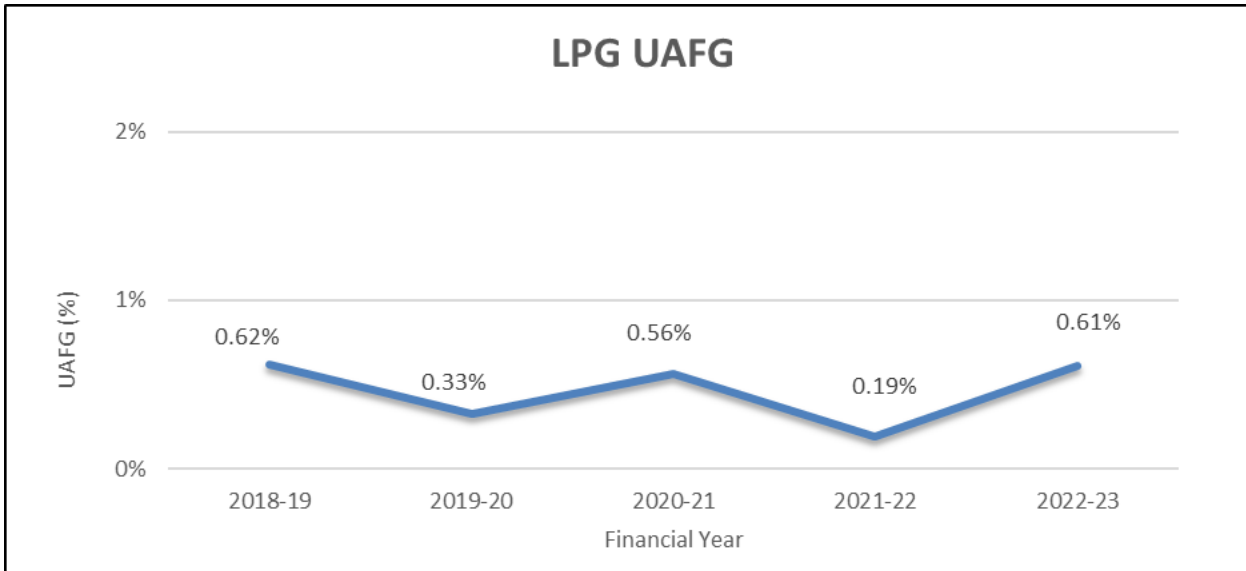


Figure 14: Percentage unaccounted for gas (UAFG) in LPG networks

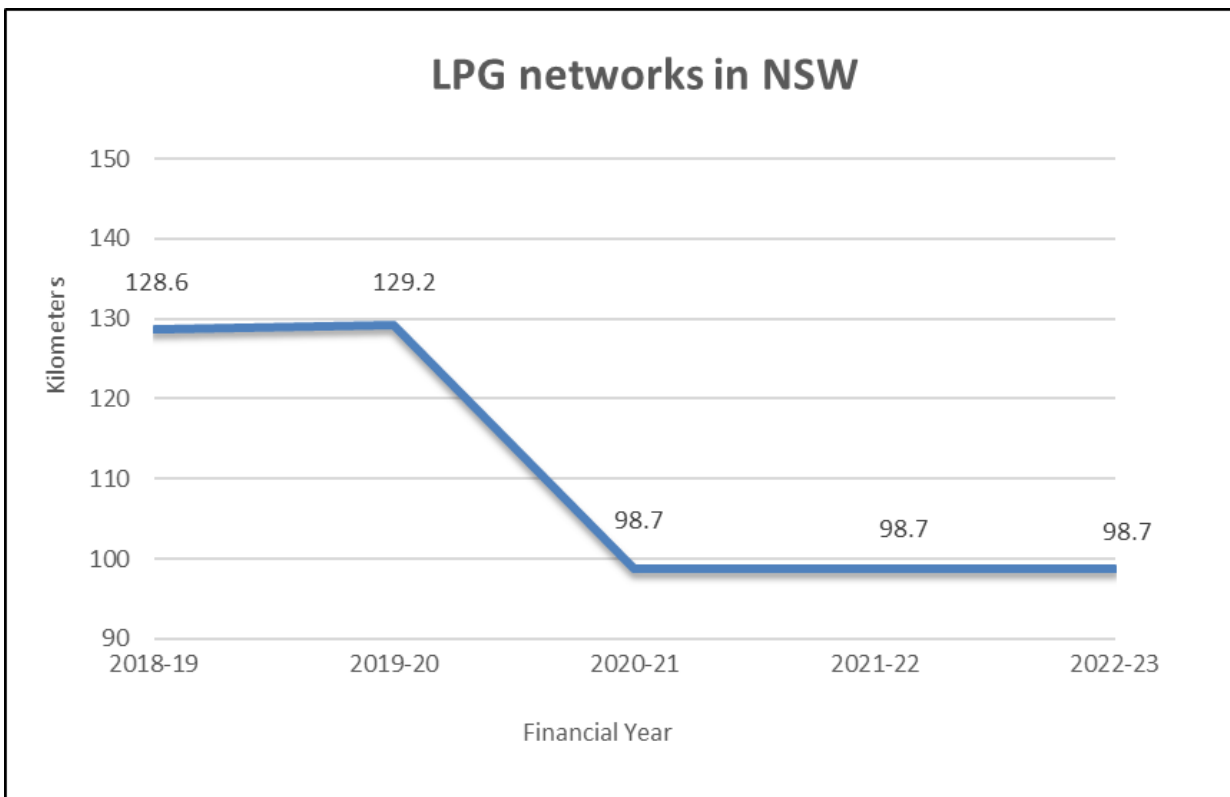


Figure 15: LPG network length in NSW

Table 8. Consumer connection information for LPG networks

Reporting period	New consumers connected to the network	Total consumers connected to the network
2018–19	26	2,317
2019–20	32	2,254
2020–21	-109	2,084
2021–22	19	2,107
2022-23	0	2,092

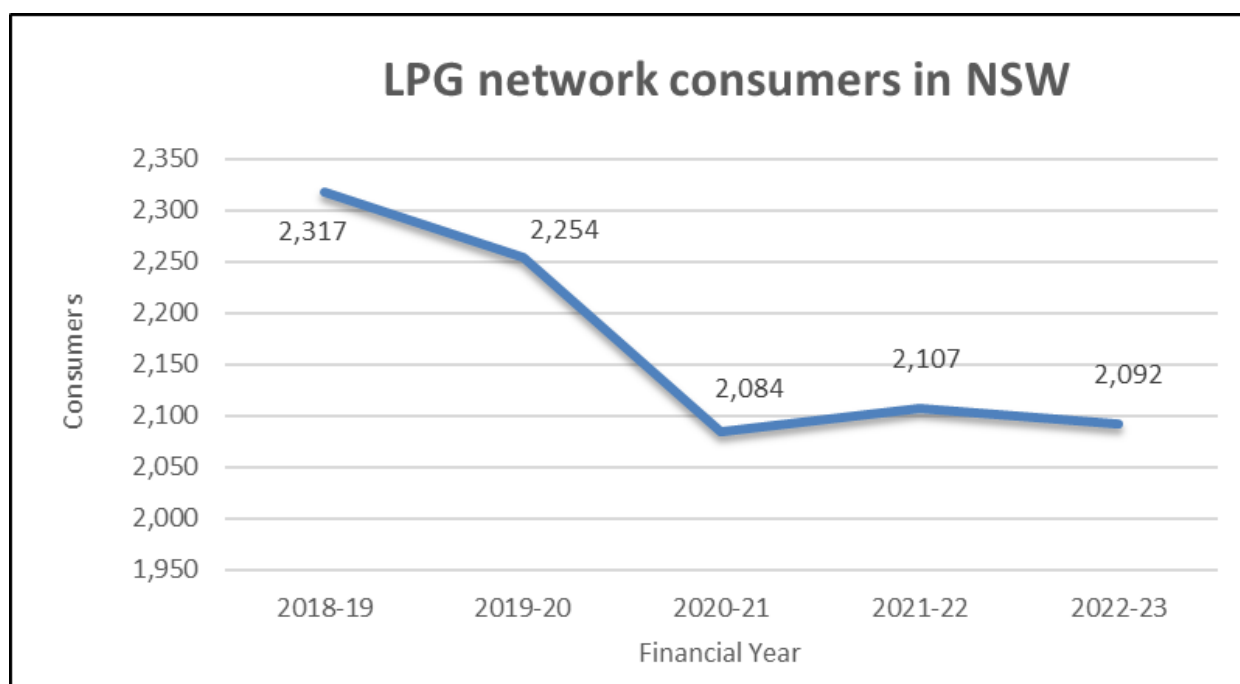


Figure 16: NSW LPG network consumer trend

Table 9. Network integrity and safety information LPG networks

Reporting period	Leaks per 10 km reported by third parties	Leaks per 1,000 customers reported by third parties	Percentage 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
2018–19	0.54	3.02	42.07%	0.00	0.00	6
2019–20	0.39	2.24	54.75%	0.00	0.00	3
2020–21	0.61	2.92	60.57%	1.51	0.10	2
2021–22	0	0	63.47%	0.16	0.00	3
2022-23	0.30	1.43	42.45%	0	0	5

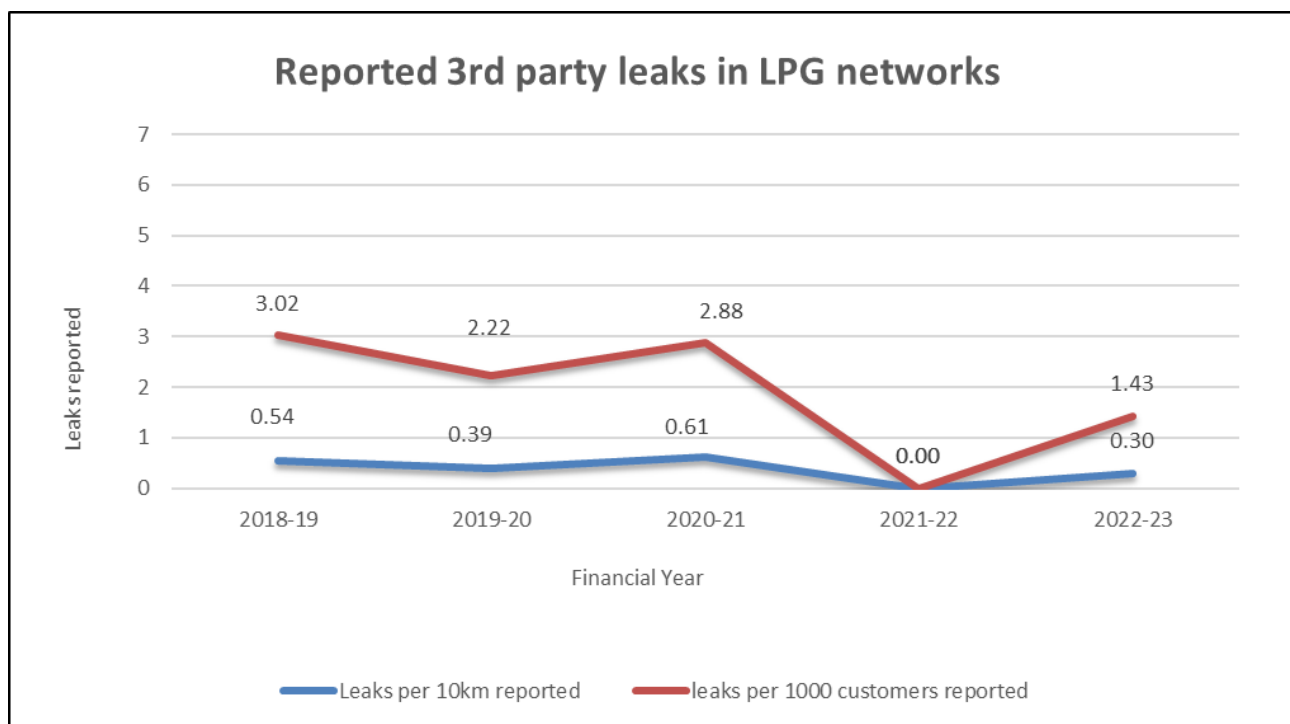


Figure 17: Reported leaks by third parties in LPG networks

Conclusion

The LPG networks across NSW supply approximately 1,092 consumers through 99 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.

One LPG section of a network was decommissioned which is indicated in the network length decreasing and the customer numbers reducing.

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 the natural gas networks.

7.2 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.

7.2.1 Natural gas networks

The natural gas supply chain, shown in Figure 18, consists of 4 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; and from April 2020 transferred to the Division of Mining, Exploration and Geoscience in the Department of Regional NSW)
- transmission system (covered in the annual [NSW licensed pipelines performance reports](#))
- distribution networks (covered in this report)
- retailers (regulated by the Australian Energy Regulator).

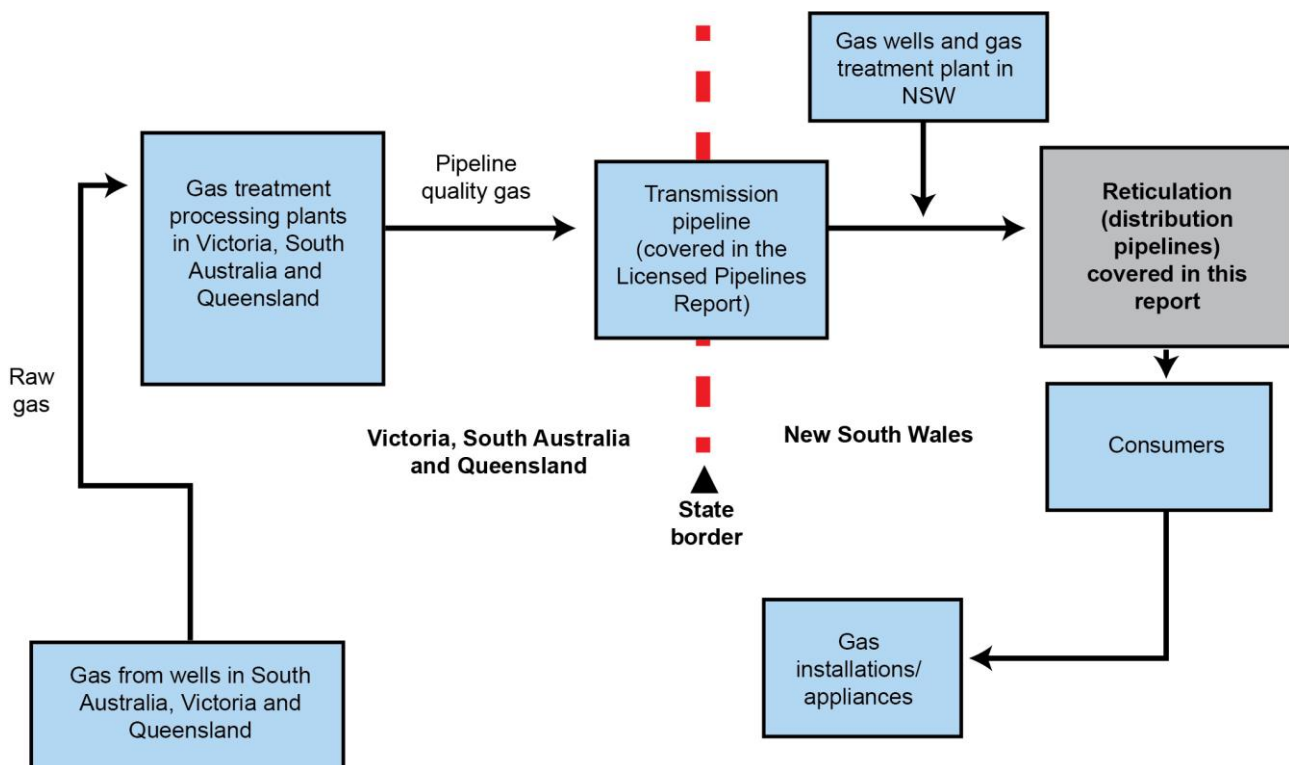


Figure 18: The NSW natural gas supply chain

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 along the east coast from Victoria to NSW; and the Victoria to Culcain pipeline that interconnects between Culcain 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 6 authorised natural gas network operators in NSW during the reporting period. The locations of these networks are illustrated in Figure 19. The networks are briefly described below.

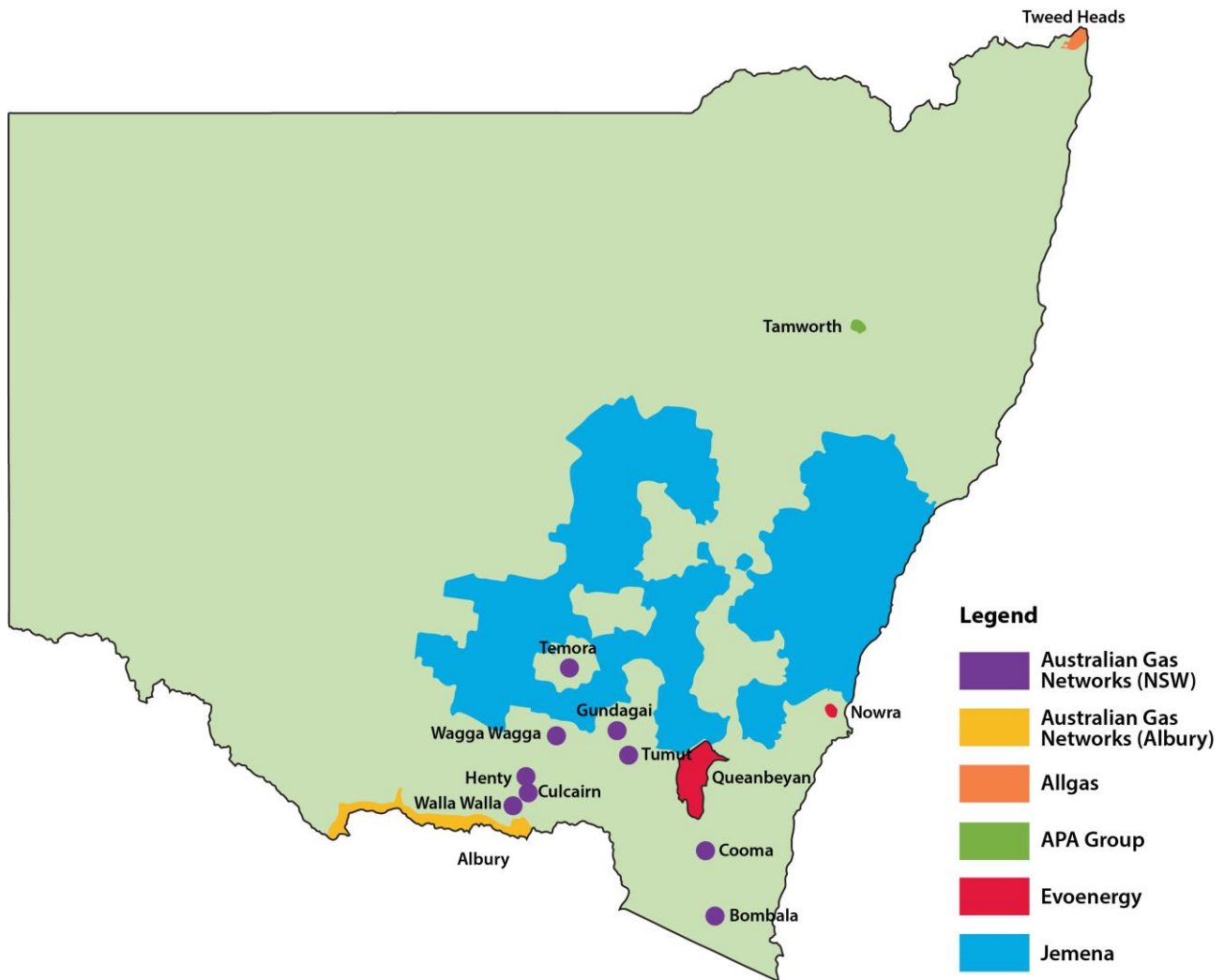


Figure 19: Location of natural gas networks in NSW

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 Networks in NSW is divided into 5 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, and south of Bankstown and west to Lithgow is serviced by Jemena Sydney North, Jemena Sydney South and Jemena Sydney West networks 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 Jemena ATA Pty Ltd and the Australian Capital Territory (ACT) Government–owned ACTEW Corporation. Evoenergy has 2 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 2 Natural Gas Reticulators 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, Gundagai, Henty, Tamara, Tumut, Wagga Wagga and Walla Walla areas.

APA Group

APA Group operates 2 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.

7.3 Appendix C. Definitions

These definitions are included in or derived from the *NSW gas networks performance reporting guidelines* (DPE 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 an 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 pipeline's 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 3 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
- 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 or 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.

8 References

DPE (Department of Planning and Environment) (2017) *NSW gas networks performance reporting guidelines* [PDF 112KB] , DPE, Parramatta.

DPE (2022) *NSW 2020–21 licensed pipelines performance report*, DPE, Parramatta.