



AER Access Arrangement 2017

Capital Expenditure Sharing Scheme

Prepared for



27 June 2017

Zincara P/L

11 Alexandra Street

St Kilda East 3183

Telephone 03 9527 4921

DISCLAIMER

Zincara endeavours to provide accurate and reliable reports based on supplied data and information. Zincara and its staff will not be liable for any claim by any party acting on or using the information supplied in this review.

Report prepared by:

Ed Teoh, Brian Fitzgerald

Reviewed by:

Suzanne Jones

TABLE of CONTENTS

1	Executive Summary	4
2	Introduction	6
3	Approach	6
4	Distribution Businesses Proposals	7
4.1	Australian Gas Network (AGN)	7
4.2	AusNet Services	8
4.3	Multinet	10
5	Gas Distribution Businesses Performance Indicators	10
5.1	AER – Victorian Gas Distribution Business Comparative Report	10
5.2	South Australia.....	12
5.3	New South Wales.....	13
5.4	Queensland.....	14
5.5	Western Australia	14
5.6	Great Britain	15
6	Conclusion	15
7	Recommended Network Health Indicators	18

1 Executive Summary

The AER has engaged Zincara P/L (Zincara) to advise on the Network Health Indicators (NHI) proposed by AGN and AusNet Services as part of the gas Capital Expenditure Sharing Scheme (CESS). The AER is interested in considering whether the proposed Network Health Indicators, which act as a countervailing effect to the CESS, are reasonable. In considering the reasonableness of the health indicators, the AER is also interested to know whether any new measures should be included.

Zincara's approach is to first identify the range of NHI used by the Distribution Businesses (DBs), Victorian regulatory authorities and also the regulatory authorities across other Australian states as well as Great Britain. From its own experience, Zincara has developed a list of indicators that a distribution business would use to manage the health of the network (Appendix A).

From the above analysis, Zincara has concluded the following:

1. Network Health Indicators. The indicators proposed by the gas distribution businesses are inadequate to represent network health. As shown in Appendix A, the DBs already use a wide range of indicators internally to assess the health of their networks.

2. Water-in-mains indicator. This is one of the indicators proposed by AusNet Services. This indicator is quite specific to low pressure mains and services and the water-in-mains incidents will reduce significantly over the 2018-2022 access period as most of the low pressure mains are replaced. It is also very dependent on the weather (rain or drought) as observed in 2011, when there was a break in the drought, resulting in a significant increase in water in mains incidents.

3. Target Setting and measurement. The issue of how to set the target needs further exploration. The options are to use historical average, extrapolate the trend or the performance of the most current year.

In all cases consideration should be given to the impact of capex programs on the future performance. Any network performance improvement from the capex should be reflected in any consideration of network health targets.

4. Setting Targets specific to each business. This approach is reasonable given that each business has different network conditions. The issue remains at what level should the indices be set. Should it be at a macro level when considering the network as a whole, or at a slightly micro level eg for different pressure tiers or mains type.

5. Network Health Index. Calculation of an Index is achievable, albeit there may require a weighting on some indicators if they have a narrow focus, such as water-in-main.

6. Actual performance. Zincara recommends annual performance be reported by the businesses to AER. It is interesting to note that Ofgem requires annual performance reporting, with some indicators having financial incentives applied annually and others at the end of the eight-year period. One of the gas distribution businesses had a £3 million “settlement” (fine) imposed as a result of two years of non-performance for a given indicator (repair risk).

7. Weighting of NHIs. As noted by the businesses, determining a “weighting” for each indicator can be difficult. However, we believe that indicators such as water-in-mains, although a useful indicator, are so specific that they don’t have an equal weight in assessing network health, compared with leaks or interruptions. Compounding this view is the fact that water-in-mains will decrease to almost zero as the mains replacement program of low pressure CI/UPS/PVC completes during the upcoming period.

8. Contingent payment sliding scale. There is a proposition by the businesses that any CESS payment would be subject to maintaining network health. Setting the full payment of any CESS contingent on network performance of 80 (asset performance index) is not reasonable. This would imply that there can be a very significant reduction in network health while being fully rewarded, and made worse with cut-off performance being as low as 60. However, it is suggested that the network health performance minimum threshold is 100 (to achieve 100% incentive payment).

9. Potential exclusions. The businesses note that there should be potential exclusions for SAIDI (due to external failures eg failure of upstream assets). We agree that there should be exclusions, nominated in the calculations.

10. Data sets. AER will need to agree and review data sets that the businesses rely on in their target setting and reporting of actual performance.

11. Sensitivity analysis. Some sensitivity analysis should be undertaken once AER has received the data sets, to determine that targets are robust.

12. Deferral/change of Capex program. AER may need to adjust the potential CESS where there is capex saving as a result of any “inefficient” deferrals (eg MRP). It is suggested that businesses are required to submit performance reports annually to track actuals and targets.

In summary, Zincara believes that the list of NHIs should be more wide ranging. Zincara has therefore developed a list of recommended NHI (refer Table 2 for further details).

2 Introduction

As part of their Access Arrangement (AA) submissions, Australian Gas Networks (AGN) and AusNet Services have proposed that the Australian Energy Regulator (AER) considers implementing a Capital Expenditure Sharing Scheme (CESS) for the next AA period 2018-2022. The two gas distribution businesses (DBs) have put forward the proposition that the CESS should be counterbalanced with the introduction of a Network Health Index (NHI). The gas NHI could be similar to the electricity Service Target Performance Incentive Scheme (STPIS) and could take into account measures such as reliability and customer services.

The AER has therefore engaged Zincara P/L (Zincara) to advise on the NHI proposed by AGN and AusNet Services. The AER is interested in considering whether the proposed NHI, which act as a countervailing effect to the CESS, are reasonable. In considering the reasonableness of the health indicators, the AER is also interested to know whether any new measures should be included.

3 Approach

Zincara's brief is to consider the reasonableness of the proposed NHI and whether they are sufficiently wide ranging. As such, Zincara has not focused on the merit or otherwise of the proposed CESS.

Zincara's approach is to first identify the range of NHI already used by the DBs, Victorian regulatory authorities and also the regulatory authorities across other Australian states as well as Great Britain:

- The DBs utilise a range of indicators to effectively operate their networks and manage the lifecycle of their assets. The DBs' Asset Management Plans along with their associated technical and operational plans provide a suite of indicators designed to inform the DBs about the condition of their network assets.
- Regulatory Authorities require performance reporting covering a range of indicators that enable them to assess the safety, integrity, reliability, environmental and customer impact of the DBs' assets. Apart from the regulatory authorities within Victoria, Zincara also identified indicators used in other Australian states and also Great Britain.

Zincara has also compiled a list of NHIs that it considered necessary to manage the network. Zincara then compared the NHIs that it had prepared or gathered to the health indicators proposed by AGN and AusNet Services.

Zincara then discussed with the AER the gaps between the DBs' health indicators and the data that Zincara has put together or complied.

In taking this approach Zincara has made the following assumptions:

- The NHIs should act as a countervailing effect on capex underspending, in particular. However it should be recognised that there can be a considerable time lag between inefficiently low capex and the impact being realised in the “health” of the network.
- Given the wide range of indicators utilised across the gas industry, any additional indicators proposed to be included in the NHI can be selected from those already existing. This should avoid any significant work effort by the DBs to gather and report.

4 Distribution Businesses Proposals

The DBs proposals in their AA submissions are summarised below. It should be noted that the summaries are only based on the initial AA proposal and not any subsequent submissions provided by the DBs.

4.1 Australian Gas Network (AGN)

AGN proposed that “.....a gas equivalent to the electricity STPIS should accompany the introduction of a CESS. This requires a consideration of appropriate measures of reliability and customer service to include in a gas STPIS.”

AGN referred to the Farrier Swier Consulting report¹ recommending a “contingent CESS”, and proposes that an asymmetric scheme accompany the introduction of the CESS. Specifically, AGN considers that the payment of a CESS reward should be contingent on AGN meeting specified key network performance indicators. The targets are consistent with the mains condition integrity indicators in AGN's “Victorian Distribution Mains and Services Integrity Plan (DMSIP):

- Leaks – Leaks detected by regular leak surveys or through public reporting and are measured across mains, services and meters. Note: AGN's Access Arrangement document (refer Annexure G – Asset Performance Index) states “...annual publicly reported gas leaks for mains, services and meters on the network....as reported to the Australian Energy Council” (ie. Excludes leak survey leaks).

¹ “Gas Service Incentives in Victoria and Albury” by Farrier Swier consulting, December 2016

- Water in mains – when water in a main occurs, it is an indicator of a leak in a main. AGN state that the length is at 31 December as reported to ESV in its report for the period ending 31 December of the calendar year.
- Unplanned SAIDI – the unplanned system average interruption duration index (SAIDI) measures the outage time experienced on average per customer across the network.

AGN proposes an “Asset Performance Index” which converts each of the averages from the above indicators into index scores and then compares against nominated targets. Then averaging each of the index scores to achieve the Asset Performance Index².

AGN propose that if a Capex reward is determined under the CESS, then the performance of the network relative to the key indicators is assessed. Appendix B of the report³ by Farrier Swier Consulting outlines the “contingent payments design”. AGN would gain the full reward if they achieve the historic or higher network performance. If they fall below the target, then the reward would be discounted on a sliding scale. The example suggests that the business would receive 100% of the reward if they achieve Asset Performance Index of 80 or greater. Network performance less than 80 results in a proportionate discount down to 0% reward if the Asset Performance Index below 60.

4.2 AusNet Services

AusNet proposes that each of the indicators is weighted equally and targets are set for the 5 year regulatory period based on historical performance. The proposed asset performance indicators to apply over the 2018-22 regulatory period reflect those that AusNet’s management uses for monitoring asset integrity and performance. These are:

- Unplanned SAIDI per customer;
- Gas leaks; and
- Water in mains.

AusNet comments that water in mains is a key integrity measure for the low pressure network, which is the target of AusNet’s mains replacement programs. As the mains replacement programs are the largest discretionary element of the capex forecasts in the next period, this measure provides a targeted counterbalance incentive for investment deferral within the five-year period.

² Access Arrangement –Annexure G

³ “Gas Service Incentives in Victoria and Albury”, dated December 2016

AusNet also proposes that the asset indicator calculation would be performed at the subsequent arrangement review when determining the value of CESS amounts. This calculation would rely on the targets in Table 11.3 (refer AusNet Access Arrangement document), summarised as:

Table 1: AusNet's Proposed NHI

Measure	Data source	Calculation	Target
Unplanned SAIDI	Gas supply lost (in minutes) and total number of customers as reported to the ESCV quarterly or captured in internal records. The time period covers July 2010 to June 2016	Aggregate the monthly data and divide the gas supply lost (minutes) by the average number of customers for each year to get an annual SAIDI. A simple average across the years is then used to determine the target.	0.914 minutes per customer
Reported gas leaks	AusNet data provided for the Australian Energy Council's annual gas distribution benchmark report. The time period covers July 2010 to June 2015.	Aggregate all leaks reported across mains, services and meters for the relevant financial year. A simple average across the years is then used to determine the target.	12.341 leaks per year
Water in mains	AusNet's water in main data provided for the Australian Energy Council annual gas distribution benchmarking report. Main length data is sourced from AusNet's internal asset management system. Time period is July 2010 to 2015. Main length data reported at 31 December.	Aggregate water in main incidents for the financial year divided by total pipeline length at mid-point of that year (ie 31 December). A simple average across the years is then used to determine the target.	0.071 water in mains incidents per km of mains per year

4.3 Multinet

Multinet advises that they do not see any justification for introducing either a CESS or a Customer Service Incentive Scheme in the forthcoming AA period, “....as there is no existing “problem” that needs to be addressed. Any such schemes should only be introduced on a national, rather than a one-off, basis for individual jurisdictions.”⁴

5 Gas Distribution Businesses Performance Indicators

The performance indicators that are used in the gas indicators in Australia and Great Britain are discussed in the sections below.

5.1 AER – Victorian Gas Distribution Business Comparative Report

The Victorian Gas Distribution Business Comparative Performance Report was last produced by AER for the 2009-2011 period. With respect to network health related indicators the following were reported:

Reliability of Supply

- **Minutes-off-supply.** The indicator for customer minutes-off-supply is called System Average Interruption Index (**SAIDI**). It measures the total minutes, on average, that a customer could expect to be without gas over the reporting period. It is reported for Unplanned, Planned and Total.
- **Interruption frequency.** The indicator for interruption frequency is called System Average Interruption Frequency Index (**SAIFI**). It measures the number of occasions per year when each customer could, on average, expect to experience an interruption. It is calculated as the total number of customer interruptions, divided by the total number of connected customers averaged over the reporting period. It is reported for Unplanned, Planned and Total.
- **Interruption duration.** The indicator is called Customer Average Interruption Duration Index (**CAIDI**). It measures the average time taken for supply to be restored to a customer when an interruption has occurred. It is calculated as the sum of the duration of each customer interruption (minutes) divided by the total number of interruptions (SAIDI divided by SAIFI). Unplanned CAIDI is the average time taken by the business to find and repair faults on the network. It is reported for Unplanned and Planned.

⁴ Multinet’s AAI section 18

- **Number of unplanned outages.** The number of outages in the reporting period resulting in customers experiencing an unplanned gas supply interruption.
- Number of outages affecting fewer than five customers.
- Number of outages affecting five or more customers.
- Significant supply interruptions. Details of these interruptions are reported individually and include date, location, number of customers impacted, duration of the interruption and cause.

Network Integrity

- Loss of containment (leakage). Number of priority A and B publicly reported leaks repaired. Note that all publicly reported leaks must be repaired within 24 hours. Note that AER did not require information regarding unrepaired leaks identified by leakage surveys, although this had been previously reported to ESCV.
- Mechanical damage – gas mains. Report the number of incidents and damage per kilometre.
- Mechanical damage – service connections. Report the number of incidents and damage per kilometre.
- Length (kilometres) of LP mains decommissioned and replaced with HP by actual and target.

Customer Services

The levels of customer service are measured in terms of their performance in responding to customer calls about serious incidents, meeting customer appointments on time, making supply connections and maintaining supply reliability. They are also measured in terms of the proportion of complaints received by the distribution businesses and received for full investigation by the Ombudsman (EWOV).

- **Response to customer calls.** The response time is the time elapsed from receipt of report classified as priority A to the representative arriving on site.
 - metropolitan: business hours – 95% within 1 hour; after hours (90% within 1 hour)
 - country: all hours – 90% within 1 hour
- **Guaranteed Service Level (GSL) payments.** As part of the 2008 GAAR the ESCV required distribution businesses to operate the GSL payment scheme. Payments are made to the individual customers impacted by the GSLs which cover:

- Appointments. Failure to attend appointment within agreed appointment window of two hours if customer present or agreed date if customer absent,
- Connections. Failure to connect within one day of agreed date,
- Repeat Interruptions:
 - Unplanned interruptions to a customer in a calendar year resulting from faults in the network
 - Upon fifth interruption
 - Upon tenth interruption
- Lengthy Interruptions: Gas supply to a residential customer not restored:
 - Within 12 hours
 - Within 18 hours

Number of complaints per 1000 customers, for “connection and augmentation”, “quality and reliability of supply” and “other complaints”. Complaints are those received by the business and also those received by the Ombudsman.

5.2 South Australia

The Essential Services Commission of South Australia’s (ESCOSA) *“Energy Businesses Regulatory Performance Report 2015- 16)* provided the following summary information relating to gas distribution performance.

ESCOSA’s regulatory requirements for Australian Gas Networks (AGN), as the sole distributor of natural gas in South Australia, are set out in the terms and conditions of the gas distribution licence held by AGN, the Gas Distribution Code and Gas Guideline No1 – Distribution.

AGN is required to meet service standards relating to minimising gas leaks. These service standards were set for the 2011 to 2016 regulatory period. The Gas Distribution Code also requires AGN to maintain gas pressure in the system, maintain the capability of the distribution system, and to maintain a Gas Measurement Management Plan and a Safety, Reliability, Maintenance and Technical Management Plan.

Network Reliability

Minimising gas leaks. AGN must have an Unaccounted for Gas (UAFG) plan, covering leakage management, asset management and mains replacement. AGN is required to use its best endeavours to achieve a level of UAFG of no more than 1,626 TJ by end of 2015-16, and to reduce the levels of UAFG in each year of the regulatory period. AEMO is responsible for calculating UAFG.

Unplanned Supply Interruptions. Includes the number of customers affected and duration. ESCOSA has not set service standards for responsiveness to potential gas leaks nor timeliness to restore supply after an interruption.

5.3 New South Wales

The NSW Trade Resources and Energy requires distribution businesses to report on:

Network Asset Information

- network pipe length (kilometre) – by pressure class;
- quantity of gas entering each gas network system;
- quantity of gas delivered to custody transfer points in each network; and
- new regions connected to gas supply.

Network Integrity and Safety Information

- leaks reported by third parties (on network only) disaggregated by pressure class;
- mechanical damage incidents to gas networks by type (eg. Excavations) and source (eg. Third party, network operator) by pressure class;
- emergency exercises or simulations conducted (and summarise findings);
- leak surveys (kilometres surveyed);
- leaks found during leak surveys; and
- calls to “One-Call” system received about work near the networks.

Key Information Indicators for network integrity and safety

- leaks per 10 kilometres of network, reported by third party;
- leaks per 1000 customers reported by third party;
- mechanical damage incidents reported per 10 kilometres of network;
- mechanical damage incidents reported per 1000 customers;
- percentage of the network leak surveyed;
- leaks per 10 kilometres of survey; and
- number of emergency simulations

Network Reliability and Consumer-related matters

- number of consumers connected to the network
- number of new customers connected to the network
- consumers hours lost through unplanned losses of supply (5 or more consumers were affected)

- unplanned losses of supply up to the meter (5 or more consumers were affected)
- instances of poor supply pressure (recorded and confirmed)
- instances of non-compliant gas entering the network
- instances of odourant level out of specification anywhere within network
- number of incidents/emergencies responded to
- number of incidents/emergencies that were not responded to within 60 minutes of receipt of notification

Key performance indicators for network reliability and customers related matters

- consumer hours off supply per 1000 customers
- percentage of calls responded within 60 minutes

5.4 Queensland

No recent reporting guidelines. However, QCA historically reported on:

Reliability

- hours lost due to planned and unplanned interruptions

Customer Service

- number of distribution related actionable calls
- number of complaints for connections and disconnections

Unaccounted for gas

5.5 Western Australia

ERA reports on the following:

- new connections;
- number of customer premises that have experienced 5 or more interruptions during the reporting period;
- number of customer premises that have experienced interruptions that have exceeded 12 hours continuously;
- number of complaints received; and
- number of calls to gas distribution call centres

5.6 Great Britain

Each of the eight gas distribution networks (GDNs) operating in Great Britain is a monopoly provider of gas distribution services. Ofgem sets the revenue which GDNs are allowed to recover in return for delivering a range of “outputs” that represent good value for money. Outputs form the cornerstone of the RIIO price control framework and reflect the minimum that customers require of a GDN. RIIO stands for Revenue = Incentives + Innovation + Outputs.

The current price control began in 2013 and runs for eight years to 2021.

Ofgem has developed a Network Output Measures Health and Risk Reporting methodology and framework that has been adopted by all gas distribution networks for the assessment, forecasting and regulatory reporting. Performance against Output targets (established at the start of the price control period). Each year, network companies must report on their performance under the RIIO-GD1 price control. A number of the outputs have financial incentives applied, either as reward only, penalty only or reward and penalty. While Outputs are reported annually, some have incentives applied annually and others at the end of the eight year price control period (refer Ofgem RIIO-GD1 annual report Table 3.1 and Table 3.2). There are primary and secondary outputs.

Zincara has reviewed Ofgem’s RIIO-GD1 Annual Report 2014-15 to explore a range of outputs that could be applied to demonstrate “network health”. While the data required to enable reporting of these outputs, at that level of detail, is far in excess of reporting requirements across Australia, the majority of outputs (at a more summary level of data) would form a suite of “health indicators” used by gas companies in Australia. They include the following categories:

- Network safety
- Network reliability
- Protection of the environment
- Social obligations
- New connections
- Customer service

6 Conclusion

As can be seen from Section 5, DBs currently report to different Regulators in various jurisdictions more information than they are proposing for the NHI. In addition, in the UK, Ofgem requires the DBs to also report on a range of indicators.

To assist in deciding whether the NHIs presented by the DBs are adequate, Zincara has put together a list of key indicators that the DBs would use to manage their networks. The list of

indicators is included in Appendix A and is based on Zincara's experience and knowledge of gas distribution networks.

Based on the above analysis, Zincara has concluded the following:

1. Network Health Indicators. The indicators proposed by the gas distribution businesses are inadequate to represent network health. As shown in Appendix A, the DBs already use a wide range of indicators internally to assess the health of their networks. Some or all of these indicators should be added to give a better representation of network health. Refer to table "Potential Network Health Indicators", section 3 below.

2. Water-in-mains indicator. This is one of the indicators proposed by AusNet Services. This indicator is quite specific to low pressure mains and services and the water-in-mains incidents will reduce significantly over the 2018-2022 access period as most of the low pressure mains are replaced. It is also very dependent on the weather (rain or drought) as observed in 2011 when there was a break in the drought resulting in a significant increase in water in mains incidents. While it is a useful indicator for the mains replacement program, it should be weighted below that for leaks and interruptions which have a broader view of the whole network. A forecast target should be derived to take into account the reducing length of low pressure mains in operation, compared with overall mains lengths.

3. Target Setting and measurement. The issue of how to set the target needs further exploration. The options are to use historical average, extrapolate the trend or the performance of the most current year.

Historical average

Using the historical average has the advantage that it will take into account any variability in performance on a year on year basis but there is still the issue of how many years should be used.

Extrapolate the trend of best fit

This option takes into account annual actual performance and uses a recognised mathematical modelling technique to forecast future performance. The issue still remains how many years should be used.

Most Current Year

It can be argued that this is the most recent information but it does not allow for year-on-year variation.

In all cases consideration should be given to the impact of capex programs on the future performance. Any network performance improvement from the capex should be reflected in any consideration of network health targets.

4. Setting Targets specific to each business. This approach is reasonable given that each business has different network conditions. The issue remains at what level should the indices be set. Should it be at a macro level when considering the network as a whole, or at a slightly micro level eg for different pressure tiers or mains type.

5. Network Health Index. Calculation of an Index is achievable, albeit there may require a weighting on some indicators if they have a narrow focus, such as water-in-main.

6. Actual performance Zincara recommends that annual performance be reported by the businesses to AER. It is interesting to note that Ofgem requires annual performance reporting, with some indicators having financial incentives applied annually and others at the end of the eight-year period. One of the gas distribution businesses had a £3 million “settlement” (fine) imposed as a result of two years of non-performance for a given indicator (repair risk).

7. Weighting of NHIs. As noted by the businesses, determining a “weighting” for each indicator can be difficult. However, we believe that indicators such as water-in-mains, although a useful indicator, are so specific that they don’t have an equal weight in assessing network health, compared with leaks or interruptions. Compounding this view is the fact that water-in-mains will decrease to almost zero as the mains replacement program of low pressure CI/UPS/PVC completes during the upcoming period.

8. Contingent payment sliding scale. There is a proposition by the businesses that any CESS payment would be subject to maintaining network health. Setting the full payment of any CESS contingent on network performance of 80 is not reasonable. This would imply that there can be a very significant reduction in network health while being fully rewarded, and made worse with cut-off performance being as low as 60. It is acknowledged that some network health indicators show volatility, but that is taken into account with the target setting. The businesses note that “...using five years of historical data, where available, to ensure that short term volatility is smoothed out”. Actual performance during the next AA period is over 4-5 years which has a similar smoothing affect. Some analysis may be required to set these thresholds. However, it is suggested that the network health performance minimum threshold is 100 (to achieve 100% incentive payment).

9. Potential exclusions. The businesses note that there should be potential exclusions for SAIDI (due to external failures eg failure of upstream assets). We agree that there should be exclusions, nominated in the calculations.

10. Data sets. AER will need to agree and review data sets that the businesses rely on in their target setting and reporting of actual performance.

11. Sensitivity analysis. Some sensitivity analysis should be undertaken once AER has received the data sets, to determine that targets are robust.

12. Deferral/change of Capex program. AER may need to adjust the potential CESS where there is capex saving as a result of any “inefficient” deferrals (eg MRP). It is suggested that businesses are required to submit performance reports annually to track actuals and targets.

7 Recommended Network Health Indicators

In reviewing the range of network health related indicators there is some broad commonality which requires consideration as to their inclusion in a NHI and effectiveness of the NHI.

Table 2: Potential Network Health Indicators:

Health Indicator	Comment
Reactive Indicators	
Guaranteed Service Level	Currently in place – not proposed to be included as a NHI.
UAFG	Currently in place – not proposed to be included as a NHI. Benchmark set by ESC and calculated by AEMO. Has a financial impact on DBs
Leaks	Proposed by AGN and AusNet as part of NHI. Publicly reported gas escapes on Mains, Services or Meters. The following “Leaks” indicators measure publicly reported leaks by asset. This enables clearer picture of where the leaks are occurring and whether there are adverse trends. Typically, mains have fewer leaks than services, and meters have the most leaks.
Mains Leaks	Publicly reported leaks on Mains (KPI could be total leaks or leaks/km)
Service Leaks	Publicly reported leaks on Services (KPI could be total leaks or leaks/1000 customers)

Meter Leaks	Publicly reported leaks on Meters (KPI could be total leaks or leaks/1000 customers)
Water in Mains	<p>Proposed by AGN and AusNet as part of NHI.</p> <p>This indicator is specific to Low Pressure mains and services and hence only applicable while these assets remain in service. It can result in supply interruptions. It is also very weather dependent. The mains replacement program for AGN and ANS will significantly reduce this issue during the 2018-2022 AA. <i>The target for the KPI of incidents/total mains km should be specifically forecast (calculated) due to the downward trend and impact of MRP program, rather than average of historical data.</i></p>
Supply Interruptions	<p>AGN and AusNet propose SAIDI (unplanned) as part of NHI.</p> <ul style="list-style-type: none"> SAIDI (minutes-off-supply a customer could experience) <p>Due to quality of the gas networks this number is quite small.</p>
Supply Interruptions (other indicators)	<p>There are several other indicators relating to supply interruptions:</p> <ul style="list-style-type: none"> SAIFI (interruption frequency per year a customer could experience) CAIDI (average duration of an interruption) <p>Restrict to “unplanned” only.</p> <p>Also used as base data for some of the interruption indices:</p> <ul style="list-style-type: none"> Number of unplanned interruptions Number of customers experiencing an interruption Number of interruptions affecting 5 or more customers Number of calls reporting poor supply to customers Customers experiencing repeat interruptions <p>Some of these details also captured for GSLs.</p>
Damage by third party	Number of damages to mains and services by third party. Network can aim to influence the volume by timely response to asset location requests and media campaigns etc. (KPI could be total damages, or split into mains, services)

Outstanding Leaks	Mainly detected during planned Leak Surveys. DBs will identify a number of leaks which they would “risk assess” to determine whether they can be monitored or require repair. For example a main scheduled for replacement could have a number of identified leaks, but they are assessed as suitable to await the replacement, hence avoiding costly repair. Condition of the network can be compromised if the number of outstanding leaks trends upwards over time. (KPI could be leaks outstanding)
Incidents	Number of incidents such as gas-in-building; fire/explosion; fatality; large supply interruption incidents; network overpressure incidents (KPI could be number of these incidents)
Response to customer calls	Response time for emergency calls (eg. Publicly reported leaks). A key indicator for responsiveness of the business and likely to be an indicator for customers’ perception of network condition. (KPI could be Time elapsed from receipt of call to representative on site. eg. >95% within “1 or 2 hour).
Complaints	Number of complaints received by DBs and also via Ombudsman. Can reflect customer’s perception of network performance.
Preventative and Condition Maintenance	
Leak Surveys	Number of leaks identified during leak survey. DBs often also undertake these surveys in areas of higher risk on a more frequent basis eg. CBD, high density locations may be undertaken on 6 monthly basis to manage asset condition rather than relying on public reports of leaks. Enables business to correct leaks in a planned manner. (KPI could be leaks/km of mains surveyed)
Preventative maintenance schedules	<p>Businesses have schedules for planned preventative maintenance/inspections of critical assets such as:</p> <ul style="list-style-type: none"> • Gas Regulator Stations; • larger I& C metering installations; • SCADA equipment;

	<ul style="list-style-type: none"> • Cathodic Protection equipment. <p>Overdue maintenance/inspections or increasing trends of equipment faults would be an indicator of deteriorating network health. Failures of these assets can have a significant impact on the network. (KPI could be % scheduled maintenance overdue by one month; number of faults/failures on asset type)</p>
Emergency Exercises or simulations	<p>Number of exercises conducted</p> <p>Exercise the preparedness of DBs to manage emergencies</p> <p>A key indicator of network health to ensure processes, people and equipment are appropriate for rapid response and management.</p> <p>(KPI could be exercises completed per schedule)</p>
Asset Records	<p>Asset records updated in timely fashion, particularly growth, mains replacement and augmentation. (KPI could be Plans updated within x days).</p>
Proactive Indicators:	
Mains Replacement	<p>Monitoring progress of approved program – actual versus target</p> <p>As a major capex program it is essential that progress is routinely monitored. If program not completed as approved then may need to adjust capex that would be subject to CESS.</p>
Meter Replacement	<p>Monitoring progress of approved program – actual versus target</p> <p>Results of meter test sampling determine whether meter families can be extended in the field or fail and need to be replaced. A high volume of meters to be replaced indicates the health of the metering assets.</p> <p>Capex may need to be adjusted subject to actual volumes replaced, as these may vary once meter testing is undertaken.</p>
Augmentation	<p>Monitoring progress of approved program – actual versus target.</p> <p>This capex can impact supply reliability and interruptions. Capex</p>

	may need to be adjusted subject to actual completion.
--	---

Appendix A

Network Health Indicators by Asset Class

There are a wide range network indicators that provide information as to the “health” of the network assets. They can be Proactive (eg managing performance of programs) or Reactive (monitoring performance in effectively responding to a network issues, such as leak response and repair). There are also health indicators relating to preventative maintenance, condition monitoring aimed at avoiding unplanned asset faults and failures.

The gas network businesses utilise these at various levels across their business to monitor asset performance and condition. Subsets of these indicators are also used in reporting to various Regulatory Authorities. These indicators can be shown in a variety of groupings, such as reliability, integrity, safety, customer service and environment. In this instance Zincara has elected to list the indicators by asset class:

4.1 Transmission Pipelines

- Pipeline patrol. Encroachments, percentage of pipeline patrolled
- Leaks
- Intelligent pigging survey.
- Coating faults
- Coating survey findings
- Cathodic protection – and faults identified
- Third party damages
- Near miss incidents
- Emergency exercises and simulations
- Augmentation program – and progress per approved plan

4.2 Pressure Regulating Stations

- Preventative maintenance – including scheduled servicing/inspection overdue
- Supply interruptions – loss of supply and duration
- Poor supply incidents – particularly near network fringe locations
- Over pressure incidents – MAOP
- Capacity modelling – identifying immediate or pending capacity limitations and network augmentation required
- Faults identified in equipment or operation
- Augmentation program – and progress per approved plan

4.3 Mains and Services

- Leaks (by pressure, material, length)
 - Fractures/Cracks
 - Water in mains (LP indicator)

- Leak survey (leaks/km of mains surveyed) – including survey of higher risk mains (eg CBD)
- Outstanding leaks - (identified leaks not repaired)
- Mains replacement program (including Services) – and progress per approved plan
- Augmentation program – and progress per approved plan
- Corrosion protection (CP potential checks) - faults resulting in main being unprotected
- UAFG (unaccounted for gas), including routine monitoring – benchmark set by ESC
- Winter pressure survey – identified fringe poor supply
- Poor supply pressure due to network causes
- One-call system - and response times
- Near miss incidents by third party
- Damages by third party
- Interruptions (planned and unplanned)
 - SAIDI (average customer minutes off supply)
 - SAIFI (average interruption frequency of interruptions)
 - CAIDI (average duration of interruption)
 - 5 or more customers
- Public reported leaks - Response times from receipt of call to attendance on site
- Incidents - such as gas-in-buildings, fire/explosion, fatalities
- Over pressurisation incidents

4.4 Meters (and associated regulators)

- Number of inaccurate meters detected
- Meter failures - unplanned replacements
- Leaks – repairable or require meter or regulator replacement
- Accuracy Sampling program – families extended or fail test and require replacement
- Meter Replacement program – progress versus schedule
- Metering pressure delivery (AS4944 Gas Meters – in service compliance testing)
- Preventative maintenance program (I&C) – including scheduled servicing/inspection overdue

4.5 SCADA facilities

- Availability of telemetry systems
- Preventative maintenance – including scheduled servicing/inspection overdue

4.6 Other Assets

- Valves – programmed maintenance (as applicable)
- Cathodic protection systems –programmed maintenance per schedule; faults

4.7 Gas Quality

- Odourant monitoring in accordance with schedule; poor odourant incidents
- Oil-in-gas monitoring (as applicable)
- Gas out of specification incidents

4.8 Asset records

- Accuracy of asset records
- Records updated in timely fashion
- Work on assets recorded in timely fashion
- Risk assessments including timeliness of identified risk reduction actions

4.9 Other

- Emergency exercises/simulations conducted
- Environmental incidents reportable to EPA
- Audits/inspections
- Equipment/tools including emergency spares - maintenance

4.10 Customer

- Leaks Response times
- Answering telephone calls in timely fashion
- Complaints handling (including Ombudsman complaints)
- Guaranteed Service Levels (GSL)