PLAN

METRETEKS REPLACEMENT PLAN

GAS-1799-PL-GM-003

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DOCUMENT HISTORY

Revision	Date	Author	Description of Changes
0	22/04/2024		Issued for AA25-30

OWNING FUNCTIONAL GROUP & DEPARTMENT / TEAM

Asset Management : Asset & Operations - Gas : Planning & Optimisation – Asset Class of Metering

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1 INTRODUCTION

1.1 PURPOSE

The purpose of the document is to specify the background for the demand billing remote reading solution-(Metretek) Replacement plan.

This plan serves as the foundation for the "Connection and Metering Forecasting Methodology", which forecasts volumes and, together with cost calculations, determines the capital and operating forecasts (and budgets) for the gas metering asset replacement programs. This document forms part of the 'Plan' suite of documents under the Jemena Asset Management System and aligns to the requirements of the JGN Measurement Asset Class Strategy.

1.2 SCOPE

This document describes the plan and methodology to identify the number of end of life remote reading hardware required to be replaced for the demand billing meters as listed below. The scheduling of hardware replacement may be varied to manage deliverability risk, minimise the cost of the replacement and ensure compliance with regulatory obligations. There are two key programs, which are listed below.

1. Planned replacement programs, including:
    a. Trial of New Remote Reading Technologies for Demand Billing Meters
    b. End of Life Replacement of Metretek Solution for Demand Billing Meters;
2. Defective replacement programs, including:
    a. Replacement of Defective Metretek.

1.3 OBJECTIVE

The Jemena Gas Networks (JGN) metering program ensures the metrological performance of metering remote reading solutions by:

1. Compliance – Ensuring accurate and appropriate metering to meet regulatory requirements.
2. Customer Satisfaction – Proactively replacing remote reading hardware before failure reduces estimated billing and meets the AEMO requirement of no more than two estimated reads per year.
3. UAG Minimisation – Enhancing metering accuracy and timely readings to minimise contributions to unaccounted for gas (UAG).

Additionally, the metering remote reading solutions guarantee that customers receive meter reading services as stipulated under Jemena Gas Network's (JGN's) Transportation Reference Service (reference service), as outlined in the box below.

The Transportation Reference Service[1] *is a service for:*

(i) *…*

(ii) *meter related services including:*

a. *…*

b. *meter reading and associated data activities as appropriate for the required capacity and meter reading frequency, but does not include Ancillary Reference Services.*

1.4 REGULATIONS AND STANDARDS

JGN undertakes meter replacement based upon the following regulation and standards:

- National Measurement Act 1960 (sections 18GD and 18GE)
- NSW Gas Supply (Consumer Safety) Regulation 2012
- NSW Department of Fair Trading Guidelines

[1] Source: Page 15 of JGN's *Reference Service Proposal for the July 2025- June 2030 Regulatory Period*, accessible on the AER website.

2 BACKGROUND

2.1 WHAT IS DEMAND BILLING REMOTE READING?

Jemena uses gas volume correctors and related technology for metering in industrial, commercial, and packaged off-take station (POTS) sites in NSW. Gas volume correctors are essential for converting actual metered volumes to standard billing volumes with the measured pressure and temperature.

Gas volume correctors are usually installed on sites consuming over 27 TJs per annum or where meters are installed before regulators and working with a floating metering pressure. and working with a floating metering pressure. The correctors are complemented by data loggers on sites that consume below 27 TJs per annum (but more than 10 TJ per annum), with corrections applied via the SAP billing system. The Demand Billing Remote Reading system encompasses multiple metering sites and a central server. The system records gas consumption directly from a meter or a connected corrector, aiding Jemena's billing process.

There are approximately 500 demand billing meter sets in the JGN network which have their meters remotely read via cellular communications. To enable remote meter reading there are two main assets consisting of:

- Field Equipment which collects and communicates the meter reads to the backend platform
- Backend platform which sends the data to Jemena’s SAP

The current devices installed in the field were supplied by [redacted] and owned by [redacted] Some of these devices are over 20 years old. During this time, the current Demand Billing Remote Reading solution has undergone a range of changes and improvement due to communications network changes.

See Figure 1 for a typical Metretek installation for a Demand Meter Set.

Figure 1: A typical Metretek system installed for a Demand Meter Set

Starting in early 2023, Jemena adopted an transitional solution to address the obsolescence of the 3G network. This involved retrofitting the existing CNI-2 modems with RV55 4G routers and replacing all current dataloggers with new CPA150 CAT-M dataloggers. These upgrades were necessary to maintain data transfer capabilities and avoid disruptions. As part of the transition, Jemena also upgraded the software from version R110.1 to R110.6. This upgrade was aimed at fixing several issues present in the older version and enhancing overall performance. The successful implementation of these measures ensures the continuous operation of the current Metretek solution. This provides Jemena with additional time to identify and implement an appropriate strategic replacement for end-of-life Metretek hardwares, such as the Mini-AT and CNI-2, ensuring long-term sustainability and efficiency in their data transfer processes.

2.2 MAJOR RISKS OF CURRENT METRETEK SYSTEM

2.2.1 DEVICE OBSOLESCENCE

The obsolescence of critical components such as the Mini-AT and CNI-2 in the current Metretek System presents a significant risk, as their production ceased in 2021. Without ongoing production and support for these components, maintaining and repairing the system becomes increasingly challenging. This not only threatens the reliability and functionality of the existing infrastructure but also poses potential operational disruptions. As the availability of replacement parts diminishes, the risk of system failures increases, potentially leading to costly downtime and service interruptions. Proactively addressing this issue is crucial to ensure the continuity and efficiency of meter reading operations. Identifying and transitioning to a strategic replacement solution is imperative to mitigate these risks and safeguard against future obsolescence.

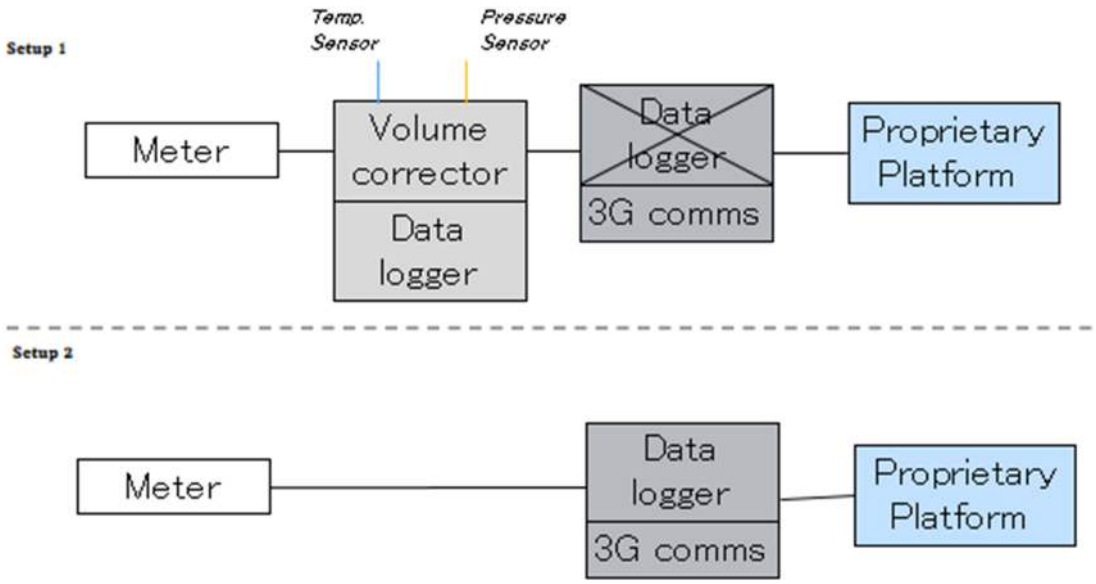
2.2.2 VENDOR RISK

[redacted] is the single vendor supplying the current Demand Billing Remote Reading Solution. Relying on a single vendor can expose our business to several significant risks that affect operational resilience and financial stability. Decreased flexibility is one such risk, as it limits our ability to adjust quickly to market changes or shifts in technology. Additionally, this dependence increases our vulnerability to disruptions; any delay or problem at the vendor's end can directly impact our supply chain and operational capabilities. There is also an elevated risk of financial losses if the vendor encounters difficulties or fails to adequately meet our company's needs. To mitigate these risks, it is crucial to consider diversifying our vendor base or developing contingency plans to ensure business continuity under various scenarios.

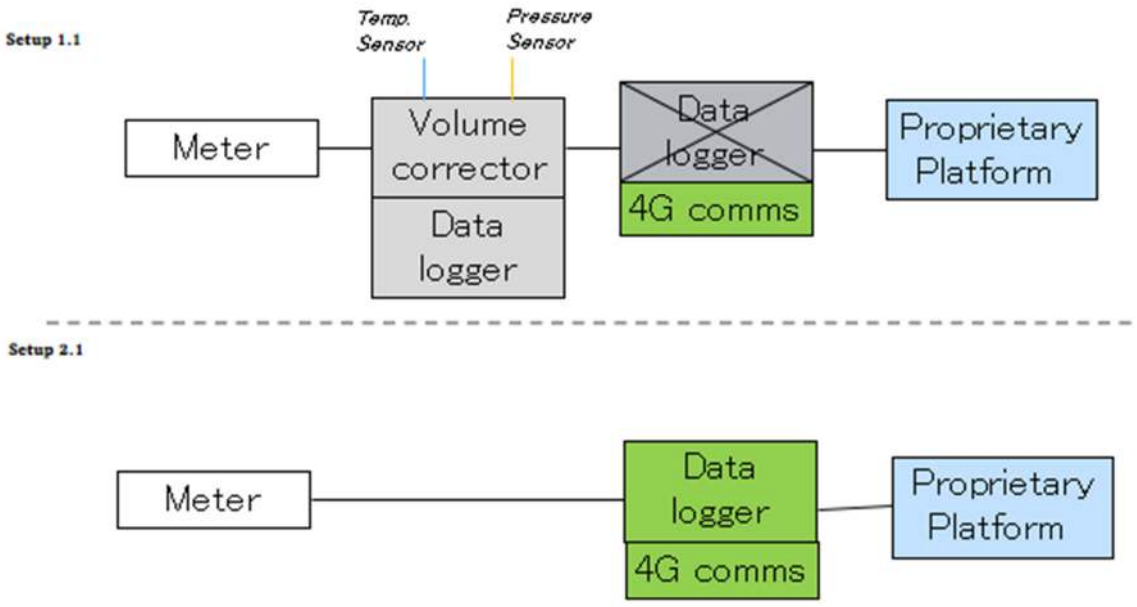
2.3 STRATEGY REVIEW

To sustain Jemena's remote reading capability and reduce the risk associated with device obsolescence and relying on single vendor to supply all the essential components of the Metretek System, we need a strategic solution to replace the end of life devices and extend the diversity to the Metretek System for demand meters. This will ensure the smooth mitigation of the end of life devices and minimize vendor-related risks. The proposed pathway and transition to the new strategy is shown in Figure 2 below.

Current Pattern:



Intermediate Pattern:



Target Future Pattern:

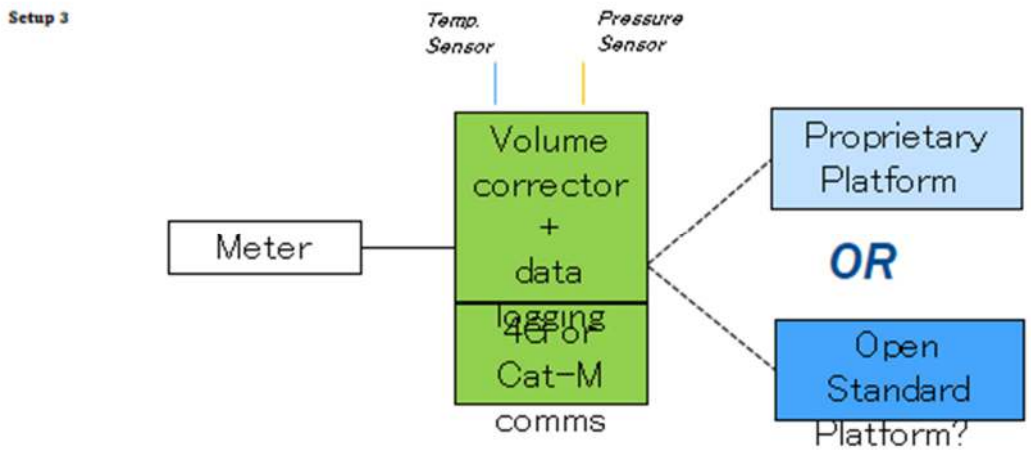


Figure 2: Design Architecture of Current, Intermediate and Final state of Remote Reading solution for Demand Billing Meters

As part of the transition state (intermediate pattern), a trial project is planned for 2024 & 2025 to test new remote reading technologies for demand billing meters, aiming to find a strategic replacement for the end of life components of the existing Metretek system to mitigate the risks mentioned in section 2.2 above.

2.4 CURRENT PROGRAMS (TRANSITIONAL)

2.4.1 METRETEK 4G UPGRADE PROGRAM

Prior to 2013/14, Jemena used the public switched telephone network (PSTN) to transfer demand meter reading data to a central data collection server. This method was effective at the time, but advancements in technology and infrastructure necessitated a change.

In 2014, Jemena transitioned to using 3G modems and dataloggers (CNI-2) to manage the impact on the PSTN due to the rollout of the National Broadband Network (NBN). This shift helped alleviate the strain on the existing PSTN system and improved data transfer efficiency.

In 2019, Telstra formally announced the shutdown of the 3G network, scheduled for June 2024. This impending shutdown required Jemena to seek alternative solutions to ensure the continuity of demand meter reading data transfer.

Starting in early 2023, Jemena adopted an intermediate solution to address the obsolescence of the 3G network. This involved retrofitting the existing CNI-2 modems with RV55 4G routers and replacing all current dataloggers with new CPA150 CAT-M dataloggers. These upgrades were necessary to maintain data transfer capabilities and avoid disruptions.

As part of the 3G to 4G transition, Jemena also upgraded the software from version R110.1 to R110.6. This upgrade was aimed at fixing several issues present in the older version and enhancing overall performance.

The successful implementation of these measures ensures the continuous operation of the current Metretek solution. This provides Jemena with additional time to identify and implement an appropriate

strategic replacement for end-of-life Metretek hardware, such as the Mini-AT and CNI-2, ensuring long-term sustainability and efficiency in their data transfer processes.

2.4.2 TRIAL OF NEW REMOTE READING TECHNOLOGIES FOR DEMAND BILLING METERS

There are 500 demand billing meter sets in the JGN network which have their meters remotely read via cellular communications. To enable remote meter reading there are two main assets consisting of:

- Field Equipment which collects and communicates the reads to the backend platform
- Backend platform which sends the data to Jemena's SAP

During 2023-24, the current Metretek and software system is being upgraded to be operable with 4G communication network.

However, there are still three main risks with the current solution and these include;

i) obsolete devices used in the field such as Mini-AT and CNI2 and
ii) current replacement solution is 3-4 times more expensive,
iii) single vendor risk and the customer service of [redacted] has been poor where there is little to no urgency to address issues raised with the team.

This trial project is mainly for investigating and trialling the other new alternative remote reading technologies or digital smart meters designed for industrial and commercial customers which are integrated with flow correction and data transmission capabilities.

The trial project is needed for 2025/26 as; it is critical that gas remains an attractive energy source and it will position the business strongly for new metering products in the new Western Parkland City and/or the Access Arrangement 2026-2030.

The overall objective is to understand the benefit (cost and increased service to customer) of moving to a new remote reading technologies/digital SMART gas meter for demand customers. The outcomes from this project will provide the core inputs into a Digital Metering Strategy. The objective will be met by implementing the following:

- Trial selected new remote reading solutions in 10-50 demand meter sets at various locations including rural locations.

- Undertaking customer engagement research to understand the value to customers and their willingness to pay for a higher service level.

- Provide key input into a Metering Remote Reading/Digitalisation Strategy by the end of 2026.

- Provide the rollout/replacement solution to the current obsolete solution from RY27 onwards which is the program in Section 3.1 below.

3 2026-2030 METRETEK PROGRAMS

3.1 END OF LIFE REPLACEMENT OF METRETEK SOLUTION FOR DEMAND BILLING METERS

In the existing Metretek system, the Mini-AT (volume corrector) and CNI2 (modem) are deployed at 300 of Jemena's largest Industrial & Commercial customer sites where consumption is above 27 TJs per annum. However, [redacted] officially discontinued these devices as of 2022. Consequently, this program is necessary to mitigate the risk associated with the obsolescence of these devices.

JGN has three potential options with respect to this program:

Option	Description	Cost	Risk	Level of Service Impact	Comments
1	**Do nothing** Once the Mini-AT or CNI2 failed, leave it as it is.	**Extreme** Not-compliant. High revenue loss and UAG impact.	**Extreme** Based upon non-compliance	**Extreme** Based upon customers with no measurement for period of time	Rejected on the basis that it does not meet the objectives, such that it is not compliant with Regulatory requirements nor in the interests of customers. And also serious impact to the revenue and UAG.
2	**Replace the failed Mini-AT and CNI-2 with Miwi-350**	**Moderate** Would require all failed Mini-AT and CNI-2 with new product Miwi-350	**Low** Focussed program. Only replace the failure unit.	**Low** Failed Mini-AT and CNI-2 will be replaced with Miwi-350 and reinstate the remote reading function.	This is the **RECOMMENDED** option adopted by JGN to fulfill regulatory obligations and ensure a reliable service that meets customer expectations.
3	**Replace the failed Mini-AT and CNI-2 with other robust solution** Introduce other robust solution to boost the diversity of demand billing remote reading solutions.	**Low** To drive costs lower, diversify the suppliers of demand billing remote reading solutions, and maintain flexibility in selecting based on cost and performance. This approach empowers the business to negotiate better prices by leveraging the available options.	**Low** Focussed program. Only replace the failure unit.	**Low** Failed Mini-AT and CNI-2 will be replaced with a new robust solution and reinstate the remote reading function.	This option is favoured to address various risks, including obsolescence of devices and reliance on a single supplier. However, currently, our only alternative is the Miwi-350. Therefore, for the next Access Arrangement, we have chosen option 2 as the recommended course of action, with the cost estimates based on that selection.

3.2 REPLACEMENT OF DEFECTIVE METRETEK

Failure to replace a defective Metretek will result in billing estimation and potentially Regulatory non-compliance for the obligation to deliver the daily actual reads to the market. In addition, the billing estimation results in inaccurate measurement impacting upon unaccounted for gas (UAG) and providing customers with incorrect bills.

Faulty Metreteks are replaced or repaired on a "run to failure" strategy. Repair of Metreteks is usually achieved by the replacement of a flat battery, electronic boards etc.

Replacement of Defective Metretek program is forecasted based on a four year historical average spend.

JGN has identified three potential options with respect to this program:

Option	Description	Cost	Risk	Level of Service Impact	
1	**Do nothing.** Leave failed Metretek as it is.	**N/A** Not-compliant	**Extreme** Based upon regulatory non-compliance, high revenue loss and impact to UAG.	**Extreme** Based upon large customers with no accurate bills for a period of time.	Rejected on the basis that does not meet the objectives, such that it is not compliant with Regulatory requirements nor in the interests of customers. And it will also seriously damage the company reputation.
2	**Repair Metreteks as they fail**	**Low** Focussed program and only fix when they fail.	**Low** Focussed program	**Low** Maintain the same service level delivered to customers	This is the **RECOMMENDED** option adopted by JGN. It maintains the operation and service level of Metretek solution.
3	**Replace the faulty Metretek with a new one** No in-situ repair.	**High** The cost of a new device is much higher than just replacing the failed parts.	**Low** Focussed program	**Low** Maintain the same service level delivered to customers	Replacing the entire unit is not a cost-effective option. Instead, replacing only the failed parts will resolve the issue more affordably and with a quicker turnaround time.

3.3 COST SUMMARY

Below is the cost summary for these two Metretek Programs in the next Access Arrangement 2026-2030. For the details, refer to “Connection and Metering Forecasting Methodology”.

	RY26	RY27	RY28	RY29	RY30	Total
End of Life Replacement of Metreteks	1,087,004	5,936,446	915,623	379,670	-	8,318,743
Replacement of Defective Mercury/Metretek Equipment	241,345	241,345	241,345	241,345	241,345	1,206,727

4 REFERENCES

Document Number	Document name
GAS-1799-SP-GM-007	Jemena Policy on Field Failure Measurement and Reporting of Metering Assets JGN
GAS-1799-SP-GM-008	Metering Equipment Maintenance and Service Life
GAS-1799-PA-GM-001	JGN Measurement Asset Class Strategy 2023
	National Measurement Act 1960 (sections 18GD and 18GE)
	NSW Gas Supply (Consumer Safety) Regulation 2012
	NSW Department of Fair Trading Guidelines

5 TERMS AND DEFINITIONS

Term	Definition
JGN	Jemena Gas Network
UAG	Unaccounted for Gas
NBN	National Broadband Network