Jemena Gas Networks (NSW) Ltd

Investment Brief
Mass Market No Access

Jemena
bringing energy to life

Glossary

AA	Access Arrangement
CSAT	Customer Satisfaction (Survey)
Current regulatory period	The period covering 1 July 2015 to 30 June 2020
ICT	Information and Communications Technology
I&C	Industrial and commercial
JGN	Jemena Gas Networks (NSW) Ltd
MDHR	Medium density / high-rise residential
Next regulatory period	The period covering 1 July 2020 to 30 June 2025
NGR	National Gas Rules
RF	Radio frequency
RMP	Retail Market Procedures (NSW)
RSA	Reference Service Agreement
RYxx	Regulatory year covering the 12 months to 30 June of year 20xx. For example, RY20 covers 1 July 2019 to 30 June 2020.

1. Mass-Market No-Access

Issue	While Jemena Gas Networks (NSW) Ltd (**JGN**) uses its best endeavours to read its customers meters, over the course of a year over 50,000 of JGN's medium density / high-rise (**MDHR**) customers (with walk-by read meters) receive multiple estimated reads (resulting in over 100,000 estimated reads). This leads to inaccurate meter readings and can result in customer confusion and frustration over bills received based on estimated reads.
Objective	The objective of this investment brief is to ensure that JGN can meet customer expectations and its regulatory obligations with respect to mass-market meter readings at sites that have access issues for meter readers.
Background	JGN has regulatory obligations to provide meter readings for market settlement and customer billing, which consist of the following customer segments: • industrial and commercial (I&C) • medium-density/high rise (MDHR) residential • mass market (new and existing residential homes or residential non-MDHR). JGN meets its regulatory obligations for the above customer segments using independent metering solutions and different equipment types, communications systems, back end systems and vendors. JGN's systems to provide the meter readings are aged and in need of update. JGN's current meter reading and data transfer technologies are dependent on legacy applications and infrastructures, and coupled with technological obsolesce, they expose JGN to security vulnerabilities and increased risks to operational reliability and uptime. Legacy meter arrangements will also be affected by the progressive decommissioning of the communication infrastructure used to poll the meters (e.g. 3G, CSD, PSTN). Continued reliance on existing systems will increase the risk that JGN will not be able to maintain the current integrity of its metering services over the 2020-25 regulatory period. For example, failure to maintain the accuracy of meters to the required standards increases the likelihood of customers being charged the estimated amount for gas usage, which is one of the greatest causes of customer concern. The mass-market customer category makes up the majority of JGN's customer base with 1.3 million gas meters of a total of 1.4 million. JGN reads the majority of meters on a quarterly basis manually. The meters of customers who consume > 1 TJ of gas per annum are read monthly. The meters of industrial customers who consumer > 10TJ of gas per annum are read daily using remote communications technology. Unlike electricity, gas meters are not smart and the vast majority are read by meter readers who visit individual properties to sight meters. Where a meter reader is not able to get access to the meter, the customer's consumption is estimated (the Retail Market Procedures[1] (**RMP**) sets out parameters for estimation). Access to detached or semi-detached dwelling meters can be prevented by locked gates, dogs, vegetation, obstructed meters, unsafe access or customer refusal. In many cases access issues are a result of changes to the built environment. This can occur when customers move or install gates/fences, or when businesses build boxes around a meter to improve aesthetics. The biggest access issues occur with our medium density / high-rise (MD/HR) customers: - meters may be located internally in apartments, particularly in older buildings - meters may be in a meter room in the common property, but the room is locked and/or access to the building requires a security pass.

[1] https://www.aemo.com.au/Gas/Retail-markets-and-metering/Market-procedures/New-South-Wales-and-ACT

	To read these meters staff must enter each building and, if the meter is internally located in the apartments, enter each apartment. If a customer isn't home, doesn't answer or refuses to let the meter reader into their dwelling, JGN will not be able to read the meter and instead has to estimate how much gas was consumed. In these instances, JGN estimates the quantity of gas delivered to the customer connection point based on the requirements of the RMP, including: • Historical gas consumption patterns at that meter • Seasonal adjustment • Photographic evidence of the meter reading submitted by customers. While JGN uses its best endeavours to read its customers meters, over the course of a year 50,000 of JGN's MDHR customers (with walk-by read meters) receive multiple estimated reads. Estimated energy bills are a major pain point for JGN customers and leads to poor reputation outcomes for JGN. It is frustrating for customers and can lead to bill shock when an actual read is obtained and is higher than the read that was previously estimated.
Regulatory compliance	JGN is obliged to read the gas meter at customers' premises or, where it is unable to do so, to estimate the meter reading – in accordance with the RMP (Chapter 3) and Reference Service Agreement (**RSA**, clause 17.1). Use of actual meter readings, rather than an estimate, improves the accuracy of billing. JGN must test the accuracy of its gas meters and replace them when they become inaccurate to comply with Schedule 4 of the Gas and Electricity (Consumer Safety) Regulation 2018.
Customer Importance	Customers are directly affected by estimates as their gas bill may not accurately reflect their actual gas usage and result in an under or overcharging. When an actual meter reading is subsequently obtained it can result in bill-shock if estimates have under-stated the actual consumption. To understand customer expectations on what is a minimum level of acceptable service, JGN conducted customer research (see: *JGN-IR004 (Q5-6)- JGN Benchmarking Report - minimum acceptable level of service-confidential.pdf*). JGN found that one estimated bill every 12 months services is the minimum performance benchmark, one estimate or less falls into the acceptable range, while two estimates are completely unacceptable to 47% of customers. JGN also surveyed a small sample (35 relative to 523 in the residential sample) and found for these customers two estimated bills serves as the minimal performance benchmark, one to two estimated bills falling within the acceptable range and three estimated bills completely unacceptable to 55% of these customers. Customer feedback has shown that customer satisfaction is adversely impacted by estimated meter reads caused by inaccessible meters. Reducing the number of estimated bills is a high priority area targeted by customer groups, and over the year to March 2019, issues with estimated bills were the fifth most common complaint to the Energy and Water Ombudsman[1]. The RMP offers customers the option of conducting self-reads to provide more clarity and an understanding that the bills reflect actual consumption rather than an estimate. However, the current system for self reads is not streamlined from a customer, JGN or retailer perspective. It also is not possible to provide end-to-end authentication using the current self-read system, which is preferred for data verification and security purposes. A Reference Customer Case Study: If JGN's MD/HR system does not provide an actual meter read it can lead to incorrect billing, customer confusion and a reduction in customer experience. For example, on 22 February 2017 an article was published in the Sydney Morning Herald on a customer's (Mr Heaney) dissatisfaction of the meter reads and subsequent excessive retailer bills from AGL that the customer received for the Maestri Towers residential building over the period 2011 to 2014. Prior to the article, Mr Heaney had been trying to deal with the metering issue for the past two and half years including with AGL, the NSW Ombudsman and JGN. After extensive review, JGN found that the MDL for Maestri Towers was not recording actual consumption and that readings were being estimated. It is often difficult to explain to a customer why they are receiving an estimate read on a remote dial up system and/or an incorrect read on a

	remote dial up system. The issue was resolved by completing significant repairs and replacements by JGN requiring six specialised field technicians, two Analysts and approximately overall six months to complete (working with AGL and the NSW Ombudsman). In addition, significant adjustments in excess of 134,932 metered credits were made to previous bills to account for the errors. Ongoing customer care has been in place since 2016 where a physical visit is undertaken on the scheduled read date to ensure no estimated reads are received by this customer.
Market impact	As the market settles on the basis of published consumption data (actual meter reads or estimated meter reads), reducing the number of estimated meter reads will result in improved accuracy of market settlement. As well as the cost to JGN of responding to queries concerning estimated consumption and inaccuracies in customer self-reads, retailers also incur costs in relation to these matters. Additionally, as retailers are prohibited from recovering amounts undercharged by more than 9 months, retailers (and therefore the wider customer group) bear the cost of long-term undercharged consumption.
Strategic Approach	JGN's strategy identifies enhancing customer experience through digitalisation and improved performance as a strategic imperative. Meter reading is one of the main touchpoints that JGN has with its customers, who otherwise deal only with JGN through a retailer. JGN has a strategic objective to reduce the usage of estimated meter reads, which aligns with customer requests for actual meter reads to be used for billing, and is consistent with the RMP requiring accurate meter readings.
Options	JGN has considered two options below to improve the efficiency and accuracy of meter readings. **Option 1: Continue reading meters that are accessible and bill on estimated consumption for meters that are inaccessible. As per recent National Gas Rules changes, accept customers to 'submit your own meter read' as an estimated reading (status quo)** **Description** This option is to continue with the status quo, with no changes to the current technology used to read meters or to the accuracy of estimations. Meter installations that are not accessible by the meter reader are estimated. In these instances, JGN and retailers will fail to meet customer expectations for billing on the basis of actual meter reads and will continue to incur additional meter reading and call centre services. Customers will continue to have the option to submit self-reads. These will be done using the existing tools available, which do not include end-to-end authentication. This option leads to a poor customer and retailer experience, high volume inbound call centre calls and exposure to financial risk for retail non-performance. **Costs** There are no direct ICT capital costs for this option. However, JGN will continue to incur additional meter reading and call centre costs due to difficult to access sites (including repeat visits and processing complaints). There are indirect costs to customers who conduct self-reads. This includes the time and effort to go through the existing process, which requires submitting photographic evidence to JGN. There are also direct costs to retailers of dealing with customer enquiries on estimated reads. **Risks** While customers are able provide a self-read via the Jemena call centre or their energy retailer, it is often not clear to them that this is an option as there is no trigger to let them know. Furthermore,

if customers provide a self-read it is considered an estimate under the RMP. However, under the RMP JGN is obliged to continue to accept customer self-reads.

The existing self-read system does not have an end-to-end authentication. Continued use of this system results in the market carrying the risk of customers providing inaccurate information that is used for billing and market settlement purposes.

Benefits

Minimum benefits are expected from this option.

NPV Analysis

This option will maintain the existing systems at low financial cost; although, at the cost of not meeting customer and retailer expectations around meter reading accuracy. JGN has modelled this as the BAU option, so no incremental costs are included.

This results in an NPV of $0.

Summary

This option will retain the existing service levels provided to mass-market customers and will incur no additional costs. However, JGN and retailers will continue to fall short of expected metering service levels for over 30,000 customers that are currently self-reading and the market will be relying on a self-read system that does not have a significant level of authentication.

Option 2: Leverage a communications-enabled metering technology solution for mass-market meter reading and allow customers to carry out self-reads with end-to-end authentication.

Description

This option is to use a mix of communications technology based metering solutions and an advanced self-read system with end-to-end authentication to address the problems that come with not having access to the meters of a subset of JGN's customers.

JGN's strategy identifies enhancing customer experience through digitalisation and improved performance as a strategic imperative. A use case has been developed to digitise customer self reads to improve customer experience and reputation. In addition, benefits for users have been identified that are contingent on:

- Customers using the digital solution to submit their own meter reads
- Customers using the digital solution to submit their own special meter reads
- A change to the RMP so that a Customer Read is considered an Actual Read.

The advanced self-read system will simplify the process for customers sending meter readings to JGN. One component of the solution is a smartphone app and QR codes added to the meter that will streamline the process of recording an image of the meter reading and uploading it to JGN's systems. It will not require the customer to determine the value on the meter as this can be done by JGN using the image (this is a particular problem for older imperial meters). The use of an end-to-end authentication for self-reads will ensure data is accurate when submitted to JGN and therefore that information published to the market is accurate.

This option also involves roll out a communication-enabled metering solution for difficult to access meters in MDHR. This program will target customers with meters in legacy sites that may be in a meter room in the common property, but the room is locked and/or access to the building requires a security pass.

The installation of Radio Frequency (RF) devices (included in JGN's network capex) will eliminate the estimated meter reads (where installed) as it will provide actual meter data remotely and will integrate with JGN systems.

Implementation of this solution requires IT spend to support the roll-out of these new communication technologies. While this solution will remove the requirement for the meter reader to attend the premise all together by utilising communications networks (such as 4G mobile networks), the cost savings will be offset by charges to support communications technologies (RF) but the meter readings will be more accurate.

See the Appendix for JGN's approach to future metering system upgrades.

Direct Unescalated Costs (mid-year 2018)

$2018	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30
Non-recurrent										
ICT Systems		1,636,404	1,636,404							
Non-ICT										
RF Devices	435,369	435,369	435,369	435,369	435,369					

The non-recurrent ICT costs for this option (Project ID ITGG18) are incurred during RY22 and RY23 and are expected to total $3.3m. This cost was estimated using JGN's standardised estimator tool. This cost covers changes to back-end and corporate systems and the development of the advanced self-read system. Based on this, JGN assesses that this is an enterprise level project that will take up to 2 years to implement and is of moderate complexity.

This project will install communications devices on the meters of existing JGN customers that are worst affected by estimated meter reads and for who the self-read option is not appropriate (such as elderly or disabled customers that may be unable to access their gas meter). This cost will be born in the metering business (i.e. part of network capex).

Conforming capital expenditure

Rule 79(1)(a) of the National Gas Rules (**NGR**) states:

> *The capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.*

Undertaking this project, the proposed capital expenditure is consistent with the NGR rule 79 as it is:

1. Prudent – The expenditure is necessary to improve the safety for JGN's meter readers.
2. Efficient – The option selected is the most cost effective long term option that meets the necessary operational requirements in order to meet the compliance with legislative, regulatory obligations and Australian Standards.
3. Consistent with accepted and good industry practice – Addressing the risks associated with positive customer satisfaction (CSAT) surveys for both customers and retailer that is accepted as good industry practice. In addition to the reduction of risk as low as reasonably practicable in a manner that balances cost and risk is consistent with Jemena's Risk Management Manual and AS2885.

The project is also consistent with rule 79(2)(c), because it is necessary to:

1. Maintain and improve the safety of services (79(2)(c)(i)) – JGN's meter readers will avoid dangerous situations including access where aggressive dogs reside.
2. Maintain the integrity of service (79(2)(c)(ii)) – JGN will be able to obtain actual meter reads for some customers rather than rely on estimated meter readings.

3. Comply with a regulatory obligation (79(2)(c)(iii)) – Chapter 3 of the RMP has general obligations in relation to reading meters, including timing for both reading meters and publishing data to the market, and section 4.4 contains provisions in relation to the replacement of aged meters. In addition, clause 17.1 of the RSA requires JGN to read or estimate the meter reading. Under both the RMP and the RSA, users are entitled to request special meter readings for a particular day. This project will facilitate accurate and efficient meter reading for all customers, consistent with these regulatory obligations.

Risks

No material risks have been identified for this option.

JGN will pursue an update to the NSW RMP. This will require support from AEMO and energy retailers.

Benefits

$2018	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30
Customer Benefits										
Customer satisfaction		20,000	30,000	390,000	400,000	400,000	400,000	400,000	400,000	400,000
Reduction in self-read effort				180,000	180,000	180,000	180,000	180,000	180,000	180,000
Reduced intrusiveness of reading		160,000	240,000	320,000	400,000	400,000	400,000	400,000	400,000	400,000
JGN Network Benefits										
Avoided re-reads				4,238	4,238	4,238	4,238	4,238	4,238	4,238
Call centre queries reduction				641	641	641	641	641	641	641

JGN has estimated a number of customer and network benefits from this option. The benefits to the network are small as many of the cost savings, such as reduced meter reading costs, are expected to be offset by increases in other expenses such as 4G mobile network access charges and providing handhelds to meter readers that can interact with short range comms. There will be benefit of increased compliance with obligations to provide actual meter reading. In addition, there will be benefit to the market in settling on more accurate information and retailers are likely to have reduced billing queries.

Customer benefits

Customers are expected to benefit from improved customer satisfaction, reduced effort to submit self reads and reduced intrusiveness of meter reading, which will lead to overall customer satisfaction. Customer satisfaction is expected to increase for most for customers that receive a communications enabled device for their meters.

The assumptions applied by JGN to determine the likely customer satisfaction benefits are:

- Installation of remote read meters (1,000 per annum, incremental) resulting in a rise in CSAT from the current 2.5 to 7.5 (the level expected when remotely read) at an estimated value of $2 per annum per CSAT score point delivering a value to each customer of $10 per annum.
- The self-read function is expected to be taken up by 50,000 MDHR customers resulting in a rise in CSAT score from the current 2.5 to 6 (the level expected when self read) at an estimated value of $2 per annum per CSAT score point delivering a value to each customer of $7 per annum. The 50,000 predicted take-up of the self-read function compares with the current approximately 100,000 estimated reads each year for the MDHR walk-by segment.

JGN estimates that the advanced self-read system will greatly reduce the time required for customers already submitting a self-read. The benefit of this approach is estimated to be $180k per annum to customers and has been determined as reducing the time taken for this process from an average 10 minutes down to 1 minute for the current 30,000 customers that self-read per annum at $40 per hour per customer. The $40 per hour is based on the ABS average hourly wage[2].

Customers will also benefit from no longer being asked to be present to provide access to the meter reader. This is intrusive for the customer and requires them to be at home at the time of the reading. Both the self-read and communications enabled device variants can contribute to avoiding the need for these intrusive readings. The assumptions applied by JGN to determine the likely benefits from reduced intrusiveness of meter reading are based on the number of meters being rolled out producing four reads per annum and a reduced impact on customers of $20 per read.

JGN Network Benefits

The assumptions applied by Jemena for each network benefit are:

- The current number of re-reads per annum is 500 per annum and JGN assumes that 75% of these can be avoided saving $11.30 per re-read.
- There are also 68 call centre calls per annum on average and JGN assumes that 75% of these can be avoided saving $12.57 per call.

NPV Analysis

This option has an overall economic value of $944,252.

See attachment "JGN-IR029 Attachment 6 (Q20)-ICT-NPV Mass Market No-Access" – NPV Calc|Option 2

Summary

This option will address concerns that JGN does not provide accurate and timely meter reading to some customers due to the use of estimated meter readings for billing. It will enable a greater number of customers to receive bills based on actual metered gas usage, either via communications enabled devices for meters or via the self-read option. Customers that have no access but choose not to submit a self-read may still have estimated bills, but the ease of use of the new system and option to install communications equipment should ensure most customers that are unsatisfied with estimated reads will be satisfied by this option.

Options Summary

The table below summarises the quantitative and qualitative differences between the analysed options.

	NPV $2018	Qualitative Risks	Qualitative Benefits
Option 1	0	High	None
Option 2	944,252	Low	High

JGN selects its preferred option by considering the direct differences between the options as expressed in the NPV analysis and indirect or qualitative differences in risks and benefits.

2 https://www.abs.gov.au/ausstats/abs@.nsf/latestProducts/6306.0Media%20Release1May%202018

What We Are Recommending	Option 2 is recommended as the preferred investment option. This option involves addressing a proportion of difficult to access meters by implementing communications technology so that visual access to the meter is not required. It will also include an advanced self-read option for customers that includes an end to end authentication to provide confidence to JGN that the information provided by customers is accurate. Option 2 results in the highest over overall economic value and improves alignment with customer expectations and reasonable cost. Option 1 is cheaper than the proposed option but does not address the concerns and of JGN's customers or retailers, nor does it maximise overall economic value. The preferred option (option 2) uses a mix of communications technology-based metering solutions and an advanced user self-read system with end-to-end authentication.
Relationship to ICT Capital Forecast	The ICT expenditure required by the preferred option for this business case is contained in the ICT AMP as a non-recurrent project under Project ID ITGG18.

Appendix: JGN's approach to future metering system upgrades

Consistent with good industry practice, in upgrading its metering systems JGN plans to prudently take an integrated metering systems view supported by industry accepted architectural principles. As IoT (Internet of Things) offerings continues to be increasingly widespread, the need for connectivity solutions grows to ensure that the metering devices are working correctly, accurately capturing and analysing data, as well as securely managing data. Adapting IoT as part of JGN's future meter reading and transfer solution will maintain JGN's service level agreements and uphold its regulatory obligations while providing ease to maintenance and future upgrades and monitoring capabilities to address security vulnerabilities.

JGN will intrinsically apply similar design and implementations principles in the next wake of solutions upgrades, installations and remediations across its metering systems (I&C (Metretek), residential and medium-density/high rise residential (MDL)). This means that JGN's proposed metering solution will entail the following principles:

1. A focus on vendor-agnostic solutions rather than single vendor end-to-end solution for long-term contracts
2. Interoperable tele-communication and open source standards (maximises adaptability and enables seamless integration with existing end to end metering topologies)
3. Flexible deployment options - on-premise or cloud-based
4. Importance of the partner ecosystem (a group of solution aggregator and partners that have the resources, expertise, and service offerings needed to deliver holistic, end-to-end solutions).

The above principles are also founded on customer behaviour, which is central to the technology design and implementation.

With a fully integrated platform for data collection and management, and ability to remote meter monitor, JGN can improve the output from metering assets, avoid unplanned downtime, implement preventive maintenance, and better equipped for future upgrades and address security threats.