Jemena Gas Networks (NSW) Ltd

IT Investment Brief – Asset Investment Optimisation

Non-Recurrent – Maintain

Jemena
bringing energy to life

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Glossary

AIP	Asset Investment Planning
Capex	Capital Expenditure
Current regulatory period	The period covering 1 Jul 2020 to 30 Jun 2025
EAM	Enterprise Asset Management
ESG	Environmental Social and Governance
ICT	Information and Communications Technology
IP	Intellectual Property
Jemena	Refers to the parent company of Jemena Gas Network
JGN	Jemena Gas Network
Next regulatory period	The period covering 1 July 2025 to 30 June 2030
NPV	Net Present Value
Opex	Operating Expenditure
RYxx	Regulatory year covering the 12 months to 30 June of year 20xx for years in the Next Regulatory Period. For example, RY25 covers 1 July 2024 to 30 June 2025
SaaS	Software as a Service
SAP	SAP accounting and Enterprise Resource Planning software
Totex	Total Expenditure

Asset Investment Optimisation

Objective	This initiative will replace the end-of-life Gating Portal to maintain Asset Investment Optimisation planning capabilities for Jemena Gas Networks (**JGN**). The preferred option will also enable enhanced optimisation of asset investment decisions, by increasing visibility of the trade-offs between cost, risk (safety, reliability, compliance, environmental etc.) and performance across scenarios in an increasingly complex environment.		
Non-recurrent ICT sub-categorisation	☒ Maintaining existing services, functionalities, capability, and/or market benefits[1]	☐ Complying with new/altered regulatory obligations/requirements	☐ New or expanded ICT capability, functions, and services

Background	Asset Investment Planning is a core capability of all large infrastructure businesses. This function ensures that resources are efficiently allocated to activities which deliver the lowest sustainable cost of providing services. Optimisation of JGN's investment portfolio requires consideration and trading-off factors such as risk (across several dimensions – e.g. safety and reliability), benefits (such as cost savings, emission reductions) as well as cost, time and resource constraints.
	Currently, JGN's Asset Investment Planning function is partially supported by an enterprise Gating Portal implemented through InfoPath 2013 and SharePoint Designer 2013. The Gating Portal applies the governance process to control project delivery and obtain stakeholder feedback, endorsement and approval at various stages of the project delivery lifecycle. The portal provides a repository of past and current projects, documents, and status. It also helps link data between Microsoft Project and our Enterprise Asset Management capabilities in SAP. This approach is supplemented by spreadsheets which are manually maintained and updated on a quarterly basis.
	There are two issues to be addressed. First, our current platform is end of life and has a series of limitations. Second, we require enhanced capabilities, consistent with good industry practice, to navigate an increasingly complex operating environment.
	
	The current platform is end-of-life and has several limitations
	In July 2023, Microsoft announced that support for InfoPath 2013 and SharePoint Designer 2013 will end on 14 July 2026.[2]
	Further, while we have made some changes to the Gating Portal since it was established in 2016, we have identified several material limitations due to the now obsolete underpinning technology. For instance, the Gating Portal:
	• Cannot provide a real-time view of a project's progress through the gating process.
	• Is inconsistent with our Project Management Methodology (requiring manual workarounds).
	• Has limited integration with existing systems such as our:
	  ○ Enterprise Resource Planning (ERP) system leading to information duplication and errors.
	  ○ HR system leading to outdated reviewers/approvers, no ability for delegation and approvals. This creates risks (which must be manually managed) to adhere to Delegated-Financial Approval (DFA) and ring-fencing obligations.
	• Has no flexibility to configure the application for different types of projects. The Gating Portal requires all information to be captured at each gate, even though some is redundant or not required to the specified level of details etc.
	• Cannot cater for project variations and change requests which are required to be maintained separately.
	• Does not provide stakeholder notification to enable the automatic set-up of project codes and release of funds.
	• Undertakes no error checking to avoid duplicate entries of projects.
	• Cannot archive projects which do not proceed through all gates.		

[1] This Investment Brief could also be categorised as 'New or expanded ICT capability, functions, and services' given the two issues which drive this investment.

[2] See here.

Together these factors mean that:

- We have limited ability to re-optimise our program due to variations or due to new information, without manually updating a series of spreadsheets.
- We have limited visibility of project status or a live view of the associated risks and benefits to support program re-optimisation.
- There is a risk of unnecessary delays at all project stages (approval of scopes, budgets, release of funds, delivery, close-outs).
- Inaccurate information leads to compliance and audit risks.

Enhanced capabilities will be needed for a more agile approach to Asset Investment planning

As outlined in the Network Management Advanced Analytics Investment Brief, JGN is operating in an increasingly complex environment with:

- several plausible future scenarios, none of which are similar to current business-as-usual.
- a number of significant challenges, such as how to ensure our services are affordable, maintaining risks with an ageing network, reducing emissions, and managing an evolving work program.

To operate in this new environment, JGN will need enhanced capabilities to reassess its entire investment program given the increasingly frequent and material changes in our operating environment. Changes to one or two key assumptions can drive large changes in what an optimal program looks like.

For instance, over the last 18 months, with respect to emissions alone in Australia:

- In August 2022, the ACT identified that it would transition away from natural gas to renewable electricity to achieve net-zero.[3]
- In September 2022, the Australian Government legislated an emission reduction target of 43% by 2030 and net-zero by 2050.
- In October 2022, the Australian Government joined the Global Methane Pledge to reduce methane emissions (which JGN produces large amounts of) by at least 30% by 2030.
- In December 2022, Energy Ministers decided to extend the national gas regulatory framework to hydrogen, biomethane and other renewable gases.[4]
- In March 2023 the Safeguard Mechanism was reformed requiring large emitters (including JGN) to reduce emissions to meet emissions reduction targets of 43% by 2030 and net zero by 2050.
- In May 2023 Energy Ministers agreed to amend national energy objectives to incorporate an emissions reduction objective.
- In July 2023, the Victorian government announced it will ban gas connections to new homes by January 2024.
- Over July to December 2023, the price of Australian Carbon Credit Units (ACCUs) fluctuated between $24.00 and $39.25. As of January 2024, the price sat around $35.[5]
- In October 2023 changes to BASIX (the residential building sustainability index which forms part of the NSW development application process) came into effect. This made it easier for all-electric homes to meet BASIC standards – reducing the proportion of new homes which will connect to gas.[6]
- In December 2023 the NSW Government legislated greenhouse gas emission reduction targets, with a targeted 70% reduction of 2005 emissions levels by 2035[7].

[3] See here.

[4] See here.

[5] See here.

[6] See here.

[7] Climate Change (Net Zero Future) Act 2023 No 48, https://legislation.nsw.gov.au/view/html/2023-12-11/act-2023-048

- In February 2024 (but published in March 2024), Energy Ministers issued a statement regarding the interim value of greenhouse gas emissions reduction. The AER later in March released draft guidance on applying this value.[8]

These changes have material implications for JGN's investment portfolio, including connections forecasts, efforts to reduce emissions as well as to prepare for receiving and transporting gases such as hydrogen and biomethane. The viability of these gases will also be subject to technological or market shifts which change their costs and commerciality, and in turn will impact JGN's optimal investment program.

Outside of emissions we have also seen significant movements with respect to:

- Increasing regulatory requirements and risks related to cyber and physical security.
- Cost increases. For example, in July 2023, AEMO reported that cost estimates for ISP projects had increased by 30% in real terms since the 2022 ISP[9] while in February 2024, the ABS released the December 2023 Wage Price Index which indicated that private sector wages had increased by 4.2% for two successive quarters – the highest increase in 16 years. Increases in cost changed the cost-benefit and priority of each project.
- Component shortages, such as electrical and control system components. Shortages require more items to be procured in advance or projects to be undertaken opportunistically based on staff and component availability.

In addition to external factors, asset integrity data has the potential to require sudden shifts in our overall investment program. For instance:

- Moving to direct emission measurement could find that leakage rates and locations differ from what was expected. This would require our mains replacement programs to be re-optimised. This could include changing the location, scaling back or even enlarging planned works.
- Asset integrity data. For example, survey results from our In-line Inspection of our high-pressure pipelines can change the kind of tool required to be used in the future or the inspection frequency and the number of inspection digs required.
- Scope risk which is particularly high with work to replace obsolete equipment– a significant component of our program given our network's age. We may find that in undertaking the first project in a program of work that the cost and risk for the program as a whole needs to updated resulting in a need to re-optimise our investment program.

These changes will not occur in isolation or at set intervals. We increasingly need to continually re-optimise our portfolio and take into account substantial movements simultaneously, while having regard to several possible scenarios.

Our current manual process for asset investment optimisation is time-consuming and requires manual updates to a series of spreadsheets. Given the pace of change we are experiencing, it is increasingly likely that the analysis and outcome of any manual optimisation process will be out of date before it is complete.

It is good industry practice to adopt an Asset Investment planning system

Adopting Asset Investment Optimisation Planning tools is good industry practice across infrastructure businesses, both in Australia and worldwide. Traditionally, this functionality has been adopted as part of Enterprise Asset Management Systems (such as IBM's Maximo) or bespoke systems (as we had implemented in 2016).

However, over the last 5-years there has been a shift towards deploying sophisticated off-the-shelf platforms, such as Copperleaf. Utilities using Copperleaf in Australia include Energy Queensland, TasNetworks, Endeavour Energy, Essential Energy, United Energy, MultiNet Gas, Citipower / Powercor and Powerlink. In the UK National Gas Transmission, Northern Gas Networks and SGN all use Copperleaf. Accepted good industry practice has now evolved to using off-the-shelf platforms (or custom-built applications with high levels of functionality) to support Asset Investment Planning.

The use of an off-the-shelf solution provides an alternative with greater functionality, lower implementation risk and lower cost (both in terms of set-up and ongoing support) than an internally developed tool.

[8] AER releases draft guidance on applying value of emissions reduction | Australian Energy Regulator (AER)

[9] See here.

	Reported benefits from the deployment of off-the-shelf platforms typically include reductions in capex programs. For instance, UK's National Gas Transmission is reported to have been able to reduce its overall capital program by 4% per year (presumably relative to its prior forecast). These benefits were reportedly achieved by evaluating investments using a portfolio approach across alternative scenarios.
Customer Importance	A key activity of JGN's preparation of its 2025-30 Plan has been its engagement with its customers through an extensive program and forums made up of residential and business customers. The residential customer forum provided the following values on what they considered to be the most important in considering various initiatives: • **Affordability** – we heard that balancing the rising cost of living is a priority for our customers so that no one is left behind due to the energy transition. Our customers want us to consider affordability over the short and long-term when making decisions. • **Reliability and safety** – we heard that customers want a safe and reliable gas service. • **Fairness** – our customers want us to consider fairness in context of the energy transition, and its impacts on both existing and future generations, and on our more price-sensitive customers. • **Access to the gas network (choice)** – We heard that customers want the choice to be able to use gas both now and into the future, and that there should be diversity of supply. • **Environment** – We heard from customers that they want us to contribute to a more sustainable environment in the future. Maintaining existing Asset Investment Planning capabilities is essential to ensuring the investment decisions deliver the lowest sustainable cost of providing services – achieving the customer value of affordability. Further, Asset Investment Planning systems improve capabilities to consider multiple criteria at the portfolio level. In turn this will reduce the risk of under-investment (which could lead to the community and customers bearing unnecessary safety or reliability risks) as well as over-investment (which would lead to additional costs and prices).
Key Considerations	In contemplating our approach to Asset Investment Planning capability, we have considered various strategic factors: • Asset Investment Planning is a critical function that must be maintained given the size of the investment program of ~$180 million per annum. • The high-level of uncertainty and the likelihood that our planning assumptions will change, and we will need to re-optimise our portfolio to not increase risk or costs to consumers/ community. To deliver a mature Asset Investment Planning capability, JGN has developed an approach, informed by vendor feedback and external research agencies, such as Gartner. Our initial scan has highlighted key insights that have informed this approach: • Mature practices rely on the ability to centralise asset information, whether it is from Asset Management systems, condition monitoring, lifecycle plans or financials. • A value framework must be developed and matured over time in order to optimise capital decisions through a rigorous and comparable process. • There is a developed market with several mature software suites providing the range of capabilities we would require in the future.
Options	JGN has considered four options to maintain our Asset Investment Planning capability: 1. Do nothing. 2. Build a new bespoke solution with functionality similar to current gating portal 3. Build a new bespoke solution with enhanced functionality 4. Purchase an off-the-shelf Asset Investment Planning solution to enhance decision support. **Option 1: Do nothing** **Description** We continue to use the Gating Portal beyond end of life and current work practices (spreadsheets and manual work arounds).

This approach does not address issues with the current platform (end of life and existing limitations). It also does not ensure that our capabilities are consistent with good industry practice and can support us navigate an increasingly complex operating environment.

Benefits

The primary benefit is avoiding additional costs related to deploying a new system.

Risks

- Additional costs incurred to procure security updates.
- Underpinning technology is already obsolete and will continue to fall behind good industry practice, missing opportunities to improve investment prioritisation.
- Sub-optimal investments (higher costs or higher customer/community risk) due to:
    - No capability to quickly re-optimise portfolio based on new information relating to policy, market, asset or technological change.
    - No capability to undertake portfolio level scenario analysis.
    - Inconsistent decisions based on inconsistent assumptions (implicitly inefficient allocation of resources).
    - Reliance on individuals and employee turnover over time results in a degradation of the process over time.
- Incurring unnecessary costs due to project approval delays and release of funds etc.
- Risks relating to reliance on spreadsheets to plug gaps including:
    - Broken/failing spreadsheets resulting in delays in decision making or poorer investment decisions.
    - Inability for spreadsheets to cope with growing or more granular datasets, resulting in limited depth of analysis and poorer decision making.
- Will limit our ability to undertake rigorous and robust analysis to justify decisions and meet regulatory and customer expectations.

Summary

This option is not recommended as running a critical business capability on obsolete technology is not consistent with good industry practice and bears excessive risks with limited benefits.

Furthermore, maintaining the current approach to asset investment optimisation via a series of spreadsheets would be more appropriate for a business operating in a static state where re-optimisation is not required on a routine basis. However, JGN is entering into a highly uncertain future and will require improved capabilities to ensure that its investment portfolio is optimised. As a result, relying on manual processes risks under and over investment.

Option 2: Build a new bespoke solution functionality similar to current gating portal

Description

We build a new Gating Portal using supported technology (such as Microsoft Power Platform) with functionality limited to address known issues. We do not implement a digital platform which supports real-time asset investment optimisation.

This approach only addresses issues with the current platform (end of life and existing limitations). However, it does not ensure that our capabilities are consistent with good industry practice and can support us navigate an increasingly complex operating environment.

Benefits

The benefits of this option include:

- Ensures that part of our Asset Investment Planning capabilities are built on supported technology (i.e. gating functionality).
- Can build on the lessons learned from our current solution.
- Can build a bespoke system designed to suit our purposes.

We estimate this option will provide $0 in benefits through improved capital efficiency, in present value terms.

Risks

- As we would be building our own gating portal, it will require a higher degree of upfront design and development costs, and ongoing internal support and regular maintenance to resolve issues as they arise on a reactive basis.
- Design will not incorporate learnings from other businesses and best practices.
- Ongoing technology risks sits with JGN rather than 3rd party responsible for maintaining product.
- Functionality will be limited and will not incorporate portfolio scenario analysis capabilities; this will continue to be done in a series of spreadsheets

Costs

$2023	RY26	RY27	RY28	RY29	RY30
Total Capex					
Propex	$1,300,000				
Recurrent Step Opex		$200,000	$200,000	$200,0000	$200,000
Total Opex		$200,000	$200,000	$200,000	$200,000
Totex	**$1,300,000**	**$200,000**	**$200,000**	**$200,000**	**$200,000**

This option will incur non-recurrent opex of $1.3M and recurrent opex of $0.8M, or totex costs of $1.8M over the 2025-30 period.

In present value terms this option will cost $2.6 million over a 10-year period.

Summary

This option is not recommended as it is not consistent with accepted good industry practice, is not fit-for-purpose given the high-levels of uncertainty regarding JGN's operating environment and provides $0 benefits in present value terms

While this solution would address end-of-life issues with the current gating portal it will require the ongoing reliance on manual processes for asset investment optimisation. This solution would be more appropriate for a business operating in a static state where re-optimisation is not required on a routine basis. However, JGN is entering into a highly uncertain future and will require improved capabilities to ensure that its investment portfolio is optimised. As a result, relying on manual processes risks under and over investment.

Option 3: Build a new bespoke solution with enhanced functionality

We considered building a bespoke solution with enhanced functionality for asset investment optimisation. This approach would address issues with the current platform (end of life and existing limitations). It would also ensure that our capabilities are consistent with good industry practice and can support us navigate an increasingly complex operating environment.

This option was not considered to be feasible given the relatively high risks, costs and unclear scope compared to option 2 or an off-the-shelf solution (option 4 below) and was not considered further as it is not consistent with good industry practice

Option 4: Purchase an off-the-shelf AIP solution to enhance decision support

Description

JGN will select and implement a commercial solution best aligned to its requirements and architecture. It will be integrated with other systems (e.g. ERP and HR system) and other tools to ensure the Asset Investment Planning solution can take advantage of granular data to support capital investment decisions.

This approach addresses issues with the current platform (end of life and existing limitations). It would also ensure that our asset investment planning capabilities are consistent with good industry practice and can support us navigate an increasingly complex operating environment.

Benefits

The primary benefits of an off-the-shelf Asset Investment Planning platform includes:

- Improving decision making by enabling better asset investment decisions based on asset condition data, maintenance costs, criticality, budgets and risks.
- The integration of an organisation-wide view on investment, highlighting synergies, generating fast comparisons, and ensuring consistency.
- Improving the agility of decision-making in the face of a changing operating environment through the generation and application of various scenarios.
- Analysis can be performed to a more intricate level, including incorporation of risk thresholds, sensitivity analysis, and dependencies.
- Greater transparency for customers (and regulators) around decision making, giving them confidence in the outcomes.
- Analysing the data to produce more robust capital investment plans over extended time horizons (rather than relying on rules of thumb or past experience).
- Reducing technical risk and improved scalability by leveraging a platform with the appropriate data security capabilities.
- Accessing a comprehensive vendor offering deployed by other utilities compared to a narrow bespoke solution.
- Access to ongoing updates provided by the vendor to provide improved capabilities and fixes for bugs and issues as they arise.
- Better de-risking of manual investment analysis and decision processes, resulting in better knowledge capture and transfer.

We estimate that the platform will provide $5.6 million in benefits through improved capital efficiency, in present value terms.

To calculate this benefit, we have assumed that unknown material factors will drive a 5% change in total capex each year (~$9m). This change in capex could be an increase or decrease in investment requirements (and could differ year to year). We expect that the Asset Investment Planning solution will enable us to optimise and:

- Reduce the impact of any cost increases by 10%.
- Increase the opportunities to reduce costs by 10%.

As a result, we expect that the Asset Investment Platform will deliver an overall capital efficiency improvement of $0.9M per year.[10] This equates to 0.5% of the total program, substantially less than seen by National Gas Transmission in the UK (assumed to be 4% of their total program).

We have not factored these efficiencies in our capex forecasts given that we do not know what material changes will occur.

Risks

Risks are considered minor and mostly occur around project implementation. These will be managed through effective project and contract management practices.

Costs

$2023	RY26	RY27	RY28	RY29	RY30
Total Capex					

[10] A 10% change to a $180M annual program is $18M. 5% of the $18M change in cost is $0.9M.

Non-recurrent Opex	[redacted]				
Recurrent Step Opex		[redacted]	[redacted]	[redacted]	[redacted]
Total Opex	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Totex	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

This option will incur non-recurrent opex of $1M and recurrent opex of $2.8M, or totex costs of $3.8M over the 2025-30 period.

In present value terms this option would cost $6.1 million over 10-years.

Summary

This option would enable JGN to acquire an off-the-shelf, industry-proven and supported Asset Investment Planning solution to make better, more accurate and timely asset investment decisions. This option is recommended as it is consistent with accepted good industry practice, fit-for-purpose given the high-levels of uncertainty with JGN's operating environment and will result in the highest net NPV (refer options summary below).

We expect that this approach will result in capital efficiencies through the re-optimisation of investments following material change. Efficiencies will be realised in JGN's actual capex through cost savings or reduced cost increases as material factors drive changes in JGN's investment program.

However, re-optimisation efficiencies cannot be incorporated into JGN's Access Arrangement static forecast. We do not currently know what material changes will occur or their cost impact; as we don't know the cost impact of these changes, we cannot incorporate the mitigating benefits which the Asset Investment Planning platform will provide.

For example, external factors may reduce short-term availability of particular suppliers resulting in higher prices or an inability to obtain suppliers at all. The Asset Investment Planning solution will support the optimisation of JGN's investment program by helping to quickly profile projects, or even sub-projects, based on these market factors. This reprofiling could allow us to defer works requiring suppliers with particular skill-sets and bring forward other projects where the market isn't as tight. As our plan doesn't take into account specific market factors which haven't eventuated yet, our forecast does not include these higher costs and we cannot incorporate the efficiency savings which the Asset Investment Planning solution makes possible.

Options Summary

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

	Capex ($2023)	Project Opex ($2023)	Ongoing opex ($2023)	10-year net NPV	Residual Risk
Option 1	Not applicable	Not applicable	Not applicable	Not applicable	High
Option 2	Not applicable	$1,300,000	$800,000	-$2,649,370	Moderate
Option 3	Not applicable	Not applicable	Not applicable	Not applicable	High
Option 4	Not applicable	[redacted]	[redacted]	[redacted]	Low

What We Are Recommending

JGN proposes to proceed with option 4 as it:

- Delivers the most favourable 10-year net NPV.
- Is consistent with accepted good industry practice.
- Is fit-for-purpose given the high-levels of uncertainty regarding JGN's operating environment.
- Will result in the lowest sustainable cost of providing services.

Dependencies on other Investment Briefs	This Investment Brief is also related and aligned to the following Investment Briefs for the next Regulatory period; • Advanced Analytics – will form inputs to asset optimisation planning • Data Governance – is required to ensure ongoing data quality being used for asset investment planning We note that there are parallels between our Network Management Advanced Analytics and Asset Investment Optimisation Investment Briefs. To be clear on their respective scopes: • Asset Investment Optimisation – relates to the strategic allocation of financial and operational resources. It will ensure that resources are allocated to activities which deliver the lowest sustainable cost of providing services by improving decision-making across investments with various drivers such as to replace obsolete equipment, reduce emissions or address integrity risks. An off-the shelf platform will allow portfolio level scenario planning and improved analysis to optimise the program as a whole. For instance, it will ensure that we can appropriately prioritise projects on a dollars per emissions basis and other risk factors, taking into account external factors such as the safeguard mechanism, Energy Ministers value of emissions reduction as well as the Global Methane Pledge. • Network Management Advanced Analytics – is focussed on our Network Management and customer functions and will bring enhanced engineering planning and customer analytics. These capabilities will help us derive deeper insights to improve decision making. For instance, it will enable us to build a deeper understanding of how changes in connection numbers and volumes (including reductions) affects pressures in constrained areas on our network and in turn the need for network augmentation and opportunities to reduce fugitive emissions.
Relationship to ICT Capital Forecast	The supporting modelling for this investment brief is contained in following investment framework model: **JGN - RIN - 4.3.5 - ICT Investment Brief – Asset Investment Optimisation – Costs and Benefits Analysis Model**