Jemena Electricity Networks (Vic) Ltd

IT Investment Brief – MSI Platform Replacement

Non-recurrent – Maintain services

Jemena
bringing energy to life

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Glossary

capex	Capital Expenditure
Current regulatory period	The period covering 1 July 2021 to 30 June 2026
ICT	Information and Communications Technology
Jemena	Refers to the parent company of Jemena Electricity Network
JEN	Jemena Electricity Network Vic Ltd.
Next regulatory period	The period covering 1 July 2026 to 30 June 2031
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
totex	Total Expenditure

MSI Platform Replacement

Objective	This initiative aims to replace Jemena's Market System Integration (MSI) platform to maintain ongoing system availability and reliability, which directly impacts critical processes such as life support and remote de-energisation / re-energisation.		
Non-recurrent ICT sub-categorisation	☒ Maintaining existing services, functionalities, capability, and/or market benefits	☐ Complying with new/altered regulatory obligations/requirements	☐ New or expanded ICT capability, functions, and services
Background	The Market System Integration (MSI) platform is a custom-built enterprise business application that manages and automates business rules, validations and acknowledgement for Jemena's electricity and gas market transactions. **The MSI platform supports several critical transactions** The below diagram illustrates the key role that the MSI platform performs in the context of the wider Jemena Electricity Network Vic Ltd. (JEN) systems landscape: [redacted] The MSI is integrated with the Customer portals and is a critical component in the meter to cash process. The MSI platform supports approximately 64,000 transactions a day, including several regulatory and customer obligations that must be met within specific timeframes. [redacted] The platform was originally implemented in 2013-14 and is [redacted]he operating system on the MSI production and test environments [redacted] The open-source software frameworks [redacted]hat MSI is built upon have ceased development meaning there is no new functionality to meet emerging requirements, security patching or support provided. As a result, key issues we are starting to experience include: • [redacted]		

	Ultimately, the unsupported MSI platform means our ability to remediate is compromised and in the event of the MSI platform [redacted] there is significant risk that there would be long delays in processing key market transactions that impact our customers.
Customer Importance	The MSI is pivotal for coordinating the following transactions between the market and Jemena's backend systems. Critical transactions that rely on this platform include: **B2B Service Orders** The MSI platform supports the Electricity B2B procedures[1] to enable Retailers to request defined services ("Service Orders") from Service Providers and to receive confirmation that the work will or will not be undertaken (or attempted) and subsequently that the work has or has not been completed as requested using a consistently understood process and transactions. There are nine types of service orders: • New Connections • Re-energisation • De-energisation • Special Reads • Additions and Alterations • Meter Reconfiguration • Meter Investigation • Supply Abolishment • Miscellaneous Services **Customer and Site Details Notification** This includes additional transactions designed to keep supporting data related to each metering site synchronised. This includes: • Customer Details Notification (names, contact phone numbers, postal addresses etc.) • Customer Details Requests (names, contact phone numbers, postal addresses etc.) • Customer Details Notification Reconciliation • Site Address Notification • Site Access Notification (information about hazards at the site, or access issues) **Customer Administrative Transfer Service (CATS) Processes** This includes additional transactions related to the Market Transfer and Settlements (MSATS) system, including: • Inbound CATS Change Requests • Outbound CATS Change Requests • CATS Reports In the event of the MSI platform experiencing an issue and unable to recover, this would lead to long delays in processing these transactions, which in turn will negatively impact customers and disrupt the operation of the electricity market. For example, delayed processing of service orders means longer lead time for customers to connect and disconnect from the network. Incorrect information in our backend system could result in missed communication/notifications to customers, potentially causing adverse impact on the customer's safety and health if the customer has life support needs.
Key Considerations	**Architectural assessment** [redacted]

[1] B2B procedures are managed by the *Information Exchange Committee* (IEC) as administered by the Australian Energy Market Operator, NER, s7.17.7.

How our costs were derived

The estimates for this initiative have been derived by using the costs from a recent Hybrid Integration Platform (HIP) project that has comparable complexity, duration, and scope. We believe this *proxy* approach to estimating costs provides an efficient and accurate estimate of costs for systems of similar scope and functionality. This approach for cost estimation is based on efficient actuals for a similar initiative and reduces risk because the base project has addressed the unknown factors that are not revealed in a cost build up approach method. It is effective for projects such as this, where the outcomes and requirements are well known but the actual future state technology to be used may vary. Given this is an internally built application currently, we have intimate knowledge of what is required to replace it, and that knowledge has been applied to the estimates provided in this brief.

Options

JEN has considered three alternatives:

(1) Do nothing – Continue to operate current MSI platform – not recommended
(2) Upgrade MSI to latest version of Java – not recommended
(3) Replace the MSI platform - recommended

Option 1: Do nothing - Continue to operate the current MSI platform

Description

This option maintains the status quo; JEN would continue to operate the current MSI platform [redacted] We would aim to manage the associated risks, for example:

- [redacted]
- Find and assess third party vendors able to [redacted]
- Quarantine changes to the platform and implement workarounds, although this is not always possible, depending on the market reforms coming through.

Benefits

By maintaining the current version, JEN would avoid incurring the costs and some of the risks outlined at Option 2 and 3 below.

Risks

The outdated platform lacks new features and functionalities that streamline operations and enhance productivity. As technology evolves, the outdated platform will become incompatible with

newer software, data formats, or hardware platforms, limiting interoperability; as a result, we would need to implement costly workarounds when interacting with other systems. For example, the current MSI cannot integrate with the new load balancer being proposed to support the Grid Stability project. As a result, Jemena would have to maintain the old load balancer as well as pay for an additional load balancer that does integrate.

[redacted] Finding a third party able to support the outdated platform will be difficult—likely impossible—and comes with inherent costs and risks.

This option carries significant operational risk - if a new issue is identified, we cannot guarantee this can be fixed at all as the software stack ceased development and is not supported. Further, the risk of the platform not being able to recover from failure may result in critical processes such as life-support and remote de-energisation / re-energisation being impacted severely. As a result, JEN is at risk of not being able to meet market obligations as outlined above in the Background section and this could result in rule breaches and financial penalties.[2] As a result, our current risk rating for the MSI platform is "Significant" – we deem it "possible" that the systems won't be available with "severe" consequences.

Over the next period, we believe the risk rating will increase to "Extreme" – this is because as the platform gets more and more outdated our ability to maintain availability and reliability is compromised. JEN's ability to adapt and meet new customer and market obligations will become increasingly more difficult. [redacted] In combination, this means that the time taken to make the systems available is longer and the market consequences greater as a result.

Risk Ratings Matrix

Likelihood		Consequence				
		1	2	3	4	5
		Minor	Serious	Severe	Major	Catastrophic
5	Almost Certain	Moderate	High	Extreme	Extreme	Extreme
4	Likely	Moderate	Significant	High	Extreme	Extreme
3	Possible	Moderate	Moderate	Significant	High	Extreme
2	Unlikely	Low	Low	Moderate	Significant	High
1	Rare	Low	Low	Moderate	Moderate	Significant

Summary

Option 1 (Do nothing) is not recommended as we do not consider it a good industry practice given the risks outlined above. The increased operational risk and reliability concerns mean that in the event of a system failure, the time taken to make the platform available is longer, and the market consequences are greater as a result.

Option 2: Upgrade MSI to latest version of Java

Description

This would involve upgrading MSI to the latest version of Java, uplift all associated open-source software [redacted] and upgrade the operating system on the MSI production and test environments.

Benefits

We would be able to re-use some core business logic compared with a replacement as outlined in option 3. We would also be able to uplift and adopt modern security controls and patches.

Risks

Most of the open-source software frameworks [redacted] that MSI is built upon have ceased development so we would need to find an alternate open-source framework and a third-party vendor to support those new open-source framework(s). We would need to re-architect and put in place customisations that make the implementation complex without the benefits associated with a full vendor-supported replacement as described in option 3.

[2] JEN should be afforded every opportunity to manage its systems and process to maintain compliance and avoid breaches and penalties.

Open-source frameworks carry the risk that they are reliant on the community to actively develop and mature them, and so replacing one open-source framework with another does not mitigate this risk.

Furthermore, given end of support dates for the recent versions of Java, risks associated with option 1 would apply to this option also. If we attempt an upgrade, we will need to buy commercial Java licences at an additional cost and then we would need to find a third-party vendor to support Java (e.g. Oracle), also likely to be at an additional cost.

The upgrade would still mean we do not have access to new features and functionalities that streamline operations and enhance productivity and interoperability.

Costs

This option has not been costed as it is not possible to upgrade the existing open-source software, and it does not address all risks outlined in option 1. Based on JEN's experience, and supported by market research[3], costs associated would be more than a replacement with a vendor-supported product (per option 3)

Summary

This option is not recommended as JEN considers that it does not reflect good industry practice given the risks outlined above.

Option 3: Replace the MSI platform

Description

Replace the MSI platform using modern application architecture and technologies that are secure, modular, configurable and scalable to meet our current and future needs.

Benefits

Key benefits of this approach include:

- A commercial product (as opposed to open source) will have vendor support and provide JEN with line of sight of their product roadmap to best determine the right product to meet JEN's evolving needs
- We will have a reliable and flexible application that provides the ability to meet market obligations by reducing the operational risk and improving the reliability of the system.
- Supports modern security controls, able to adhere to security requirements and improve overall security posture.
- The modular, extensible platform enables JEN to respond to market changes quickly as there is improved observability and monitoring; this is becoming increasingly important with the AEMO roadmap of reform changes.

Risks

As we need to continue to support the current payload formats used by the market, the replacement platform would need to support today's market transactions and build support for the upcoming new payload formats expected to be introduced by future reform. We will support this requirement by building modular, configurable components e.g. extracting business logic in the middleware layer to minimise changes to existing application logic (e.g. SAP).

Costs

This is an Enterprise-wide initiative, which means the costs of operating this system are shared across a broader set of Jemena enterprises. A consequence of this approach is that JEN's customers benefit from (i) lower costs and (ii) greater purchasing power when negotiating vendor contracts.

[3] https://www.thoughtworks.com/content/dam/thoughtworks/documents/e-book/tw_ebook_build_vs_buy_2022.pdf

<table>
<tr><td></td><td>This option will require non-recurrent capex costs of $1,380,000 over the next regulatory period to replace the MSI platform. JEN has based these costs on a similar project (refer ‘key considerations’ above) and assumes a prudent approach to resourcing using a blend of employees (‘internal labour’) allocated to the project, supplemented by consultants and/or contractors (‘external labour’). This mix will be refined as further planning, design and market engagement is undertaken.

Summary
This option is recommended as we consider it reflects good industry practice given the benefits and risks outlined above. Furthermore, it provides the lowest sustainable cost.</td></tr>
<tr><td>Options Summary</td><td>The table below summarises the quantitative and qualitative differences between the analysed options.
<table>
<tr><th>$2024</th><th>Capex</th><th>Opex</th><th>Totex</th><th>NPV</th><th>Residual Risk</th></tr>
<tr><td>Option 1</td><td>Not applicable</td><td>Not applicable</td><td>Not applicable</td><td>Not applicable</td><td>Very High</td></tr>
<tr><td>Option 2</td><td>Not applicable</td><td>Not applicable</td><td>Not applicable</td><td>Not applicable</td><td>Moderate</td></tr>
<tr><td>Option 3</td><td>$1,380,000</td><td>Not applicable</td><td>Not applicable</td><td>Not applicable</td><td>Low</td></tr>
</table></td></tr>
<tr><td>What We Are Recommending</td><td>JEN proposes to proceed with Option 3: MSI Platform Replacement.
JEN considers that it best reflects good industry practice, and it provides the lowest sustainable cost.</td></tr>
<tr><td>Dependencies on other Investment Briefs</td><td>Not applicable.</td></tr>
<tr><td>Relationship to ICT Capital Forecast</td><td>The supporting modelling for this investment brief is contained in the following model: JEN – IT Investment Brief – MSI Platform Replacement – Costs and Benefits Analysis Model</td></tr>
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