Market Systems currency

PAL BUS 7.06 - Market systems - Jan2020 - Public Regulatory proposal 2021–2026

Contents

1 Overview

Business	CitiPower and Powercor Australia
Title	Market Systems currency
Project ID	PAL BUS 7.06 - Market systems - Jan2020 - Public
Category	IT Capital Expenditure - recurrent
Identified need	Ensure our market systems remain within vendor support to ensure we continue to deliver data to market in accordance with AEMO's market procedures and the National Electricity Rules.
Recommended option	Option 1: Perform prudent technical upgrades to remain within vendor support by adopting every second system upgrade release (n-1). This option supports regulatory compliance and provides the optimal balance between mitigating the most probable risks and deferring spend where efficient. This reflects current business as usual practice.
Proposed start date	2021/22
Proposed commission date	2025/26
Supporting documents	1. PAL MOD 7.09 - Market system cost - Jan2020 - Public 2. PAL MOD 7.10 - Market system risk - Jan2020 - Public 3. PAL MOD 12.02 - Quoted services labour rate - Jan2020 - Public

We jointly own and operate two of Australia's largest electricity networks. We are responsible for providing integrated and scalable meter data management, market transaction and network billing systems for over 1.2 million Victorian households and businesses across our networks. Our customers expect us to continue to provide safe, dependable, flexible and affordable electricity supply while meeting our regulatory obligations.

Our Market Systems provide centralised storage and validation of meter reading data and manage market-compliant communications and customer requests both internally and with external participants of the National Electricity Market (**NEM**). Our Market Systems are essential for ensuring compliance with our regulatory obligations under the Australia Energy Market Operator (**AEMO**) procedures, National Electricity Rules (**the Rules**) and Distribution Code.

Ensuring technical currency of our Market Systems by remaining within vendor support is essential to ensure continued vendor support of the critical software and compatibility with the integrated software. By ensuring currency, the software vendor will provide fixes to software issues at no additional cost. This minimises the risk of a critical process failure and non-compliance with regulatory obligations.

We compared options for maintaining the technically currency of our market systems based on alignment to desired future state, cost-benefit analysis and reduction of risk to IT systems and business operations.

The following table provides a summary of our options analysis for the 2021-2026 regulatory period.

Table 1   Options analysis summary, cost and risk analysis over 2021–2026 regulatory period, $m June 2021

	Option	Cost	Risk
0	Do nothing - do not upgrade to maintain current software versions in relation to Market Systems. Additional operating expenditure is charged by vendors.	4.2	36.4
1	Prudent technical upgrades - remain within vendor support by adopting every second software version release upgrade	9.3	2.2
2	Vendor released technical upgrades - perform system upgrades as released by vendors, maintaining pace with newest available versions as they are released	11.4	2.2

Source: Powercor

Based on our options analysis, we recommend option 1 - to perform prudent technical upgrades to remain within vendor support by adopting every second version upgrade (N-1). Option 1 is based on our business as usual practice and provides the best value for customers when considering the associated costs and risks. This option maintains minimum currency on all core Market Systems applications.

The risks associated with option 0 were considered too high, while the costs associated with option 2 were considered unjustified and avoidable. Unlike option 0, our preferred option 1 avoids the risk of incurring penalties for non-compliance and the risks to processes that support the day-to-day needs of customers, the business and the wider NEM. Unlike option 2, option 1 extends asset life beyond formal vendor recommended upgrade timelines within acceptable risk levels and delays upgrades and associated costs until necessary.

2 Background

2.1   Our Market Systems

We utilise integrated and scalable meter data management, market transaction and network billing systems to meet strict licencing and market compliance requirements. We refer to these as our Market Systems.

Our Market Systems provide centralised storage and validation of meter reading data. They also manage communications, customer requests and data exchanges internally and with external market participants including retailers and the AEMO in line with our compliance obligations.

Our Market Systems are essential for a number of major functions:

- Providing market settlement data to AEMO and meter data to retailers so they can bill for usage. In 2018, our Market Systems validated and delivered 21.2 million meter readings to the NEM.

- Performing network billing and associated revenue collection from retailers. In 2018 our Market Systems enabled us to issue 16.1 million invoices to retailers in relation to network billing.

- Management of customer, site and meter details in relation to the 1.2 million sites in our distribution areas.

- Resolving customer issues in the contact centre.

- Actioning market transaction requests between NEM participants. Market transactions between participants such as retailers and distributors support consumer connection point transfers, management of standing data, the provision of customer details, life support notifications and meter data requests. We receive around 78,500 market transactions[1] per business day which are managed via automated processes built within our Market Systems.

- Managing new connection requests and actioning energisations and de-energisations (both remote and physical). In addition to market transactions mentioned above, we also receive customer or retailer requests in the form of a business-to-business (**B2B**) service order. These are also supported by automated processes within our Market Systems. The main requests relate to re-energisation or de-energisation of a site when a customer moves house.[2] On average, we receive and action 2,400 B2B service order requests per business day.

An overview of the current Market Systems application landscape is provided in figure 1 below. The following table describes each systems function. Appendix A provides more information including the current version and the name of the software vendor.

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1   Examples of these transactions include a change of retailer, change to market role responsibilities, creation of a NMI and maintenance of NMI data.

2   Other requests relate to requests for a special reading, meter exchange, supply abolishment, change of tariff or advice of a new life support customer.

Figure 1   CitiPower/Powercor Market Systems architecture overview
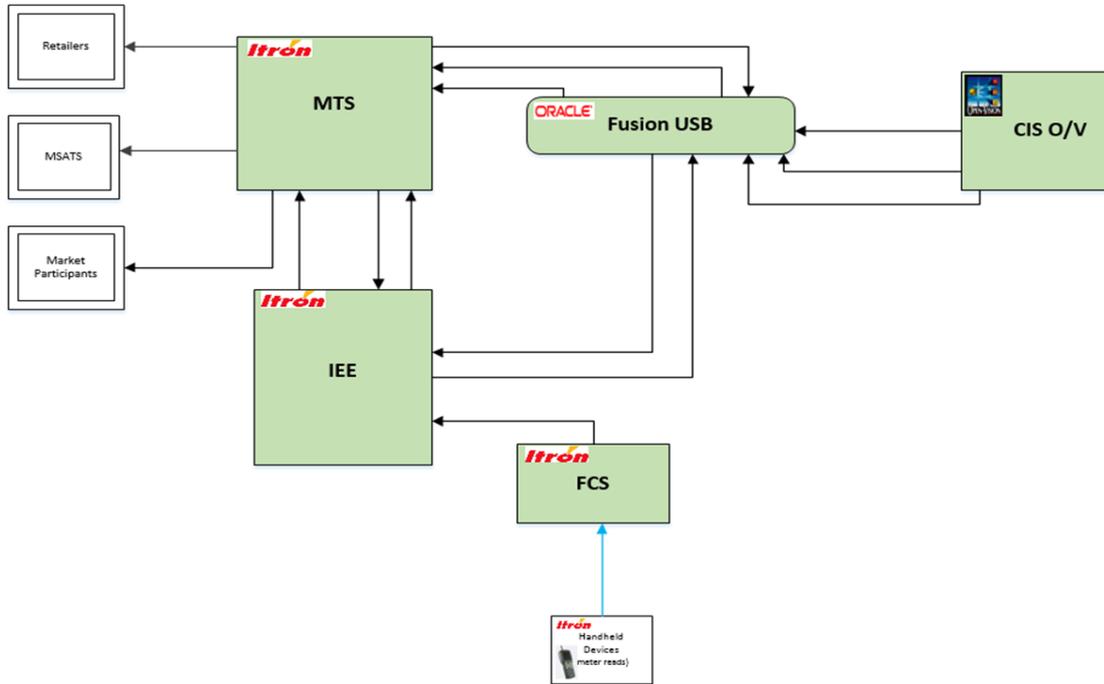
Source: Powercor

Table 2   Market Systems application summary

Application	Function	Description
Market Transaction Suite (**MTS**)	Manage communications with external market participants	Ensures industry compliance on market transaction functions, including the delivery of meter data, network billing and market transactions via B2B and CATS transaction mechanisms. Underpins communications and data exchanges between the organisation and external market participants, including retailers, meter data providers, metering providers and AEMO.
Itron Enterprise Edition (**IEE**)	Interval meter data collection, storage, management and processing	Flexible off-the-shelf platform that receives and processes interval meter data from the AMI meter fleet. Validated reads are sent to market to fulfil regulatory obligations and also passed to internal systems for network billing and collections.
Customer Information System - Open Vision (**CIS-OV**)	Customer information and relationship management, account management, billing and collection.	Specialised industry solution to support: • customer and retailer information management • creation of National Market Identifiers (**NMIs**) • billing and payments • meter management • management of remote re-energisation/de-energisation • accumulation (basic) meter data maintenance.
Field Collection System (**FCS**)	Scheduling and management of manually read meters.	Mobile meter data collection software to collect and automate the transfer of data to and from devices supporting the manually read meter fleet. Meter data is sent either to the billing system or to IEE.
Oracle Fusion	Integration layer (middleware).	Facilitates and controls routing of messages and transactions exchanged between IT applications within Market Systems and between Market Systems and organisational systems (e.g. SAP, Click).

Source: Powercor

2.2 Regulatory compliance

Our Market Systems ensure we manage and deliver data to market in accordance with AEMO's market procedures and the Rules.[3] Regular audits of our data, processes and systems are performed by AEMO to ensure compliance with market rules and procedures.

The Australian Energy Regulator (**AER**) is responsible for monitoring, investigating and enforcing compliance with obligations under the Rules. The statutory enforcement regime includes a number of powers that enable the AER to enforce the Rules including powers to issue infringement notices. Escalation actions initiated by the AER can include initiating court proceedings. Further, the AER has advises in its "Compliance and Enforcement– Statement of Approach" that it may report on the outcomes of its monitoring, enforcement and investigation activities (using media releases, investigation reports, compliance bulletins/reports). Press coverage of non-

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3   Refer Appendix B for a table outlining linkages between AEMO procedures and the Market Systems which support compliance.

compliance with NEL/the Rules obligations is likely to occur and this may adversely affect the reputation of the businesses.

Our Market Systems also hold the master record in regard to life support customer data. Safety is our number one priority. It is also a customer expectation that we will ensure a safe and continuous supply of electricity is maintained to these significant customers. A breach of our notification obligations for a life support customer could pose as safety risk. It would also result in a breach under the Electricity Distribution Code administered by the Essential Services Commission (**ESC**). The ESC may issue enforcement penalties as shown in the table below.

Table 4   ESC enforcement penalties

Essential service commission enforcement tool	Essential services commission enforcement penalty
Criminal penalty	The maximum penalty that may be payable for a contravention of the applicable provisions of the ESC Act and the Electricity Industry (EI) Act varies between penalty units worth $18,655 and $777,300 depending on the contravention. For some contraventions, the ESC Act and the EI Act provide for additional penalties to apply for each day the contravention continues.
Civil penalty	The maximum civil penalty that can be imposed if a person has contravened (or is contravening) a condition of a licence and does not comply with the civil penalty notice issued by the ESC is penalty units worth $105,712.
Energy Industry Penalty Notice	The infringement penalty for an "energy industry contravention" starts at $5,000 per contravention rising to $20,000 per contravention.

Source: Powercor

In addition to financial penalty risks, if compliance cannot be demonstrated, we also risk loss of licence to operate as a market participant in the NEM. Avoiding financial penalties ensures we can continue to offer our customers cost effective pricing.

Further, ensuring the health and currency of our Market Systems safeguards our ability to swiftly and cost efficiently adapt to rule or procedural changes in the NEM. Recent examples of rule changes impacting our Market Systems are provided below:

- Metering contestability (Power of Choice) market changes in 2017 involved hundreds of system changes. The changes were delivered on time so that customer service levels and compliance could be maintained.

- In 2018 were updated our Market Systems to strengthening protections for customers requiring life support equipment.[4]

- A recent change to the Rules places an obligation on the AEMO to establish a static register of Distributed Energy Resources (**DER**) in the NEM. During 2019 we are implementing the changes within our Market Systems to capture and share DER data. This data will help in planning and operating the power system as it transforms.[5]

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4   This was in response to National Energy Retail Amendment Rule 2017 No. 3.

5   On 13 September 2018, the AEMC made a final rule determination in regard to National Electricity Rule Clause 3.7E which places an obligation on the Australian Energy Market Operator to establish a static register of DER in the National Electricity Market (**NEM**).

2.3 Customer expectations

Our customers expect us to maintain compliance with the Rules to ensure they receive a safe, dependable, flexible and affordable supply of electricity. Our Market Systems underpin delivery of both customer service and our compliance requirements.

Table 3   Customer expectations in relation to theme

<table>
<tr>
<td>
Safe and dependable</td>
<td>When our customers move house and require a supply connection or disconnection, they rely on us to take prompt action to ensure the move occurs without any disruption. Our Market Systems platform enables us to swiftly action the customer's request through a remote re-energisation or de-energisation.

Our Market Systems hold the master record in regard to life support customer data. Safety is our number one priority. It is also a customer expectation that we will ensure a safe and continuous supply of electricity is maintained to these significant customers. A breach of our notification obligations for a life support customer could pose as safety risk. It would also result in a breach under the Electricity Distribution Code.

As an essential service, we aim to provide our customers with prompt response to their queries. Market Systems are the primary method for our contact centre staff to access our Market Systems to identify site and customer data and when rectifying customer queries.</td>
</tr>
<tr>
<td>
Flexible</td>
<td>Ensuring the health and currency of our Market Systems platform safeguards our ability to swiftly adapt to rule or procedural changes in the NEM. For example, under the five minute settlement rule change we will be required to provide meter data every five minutes instead of every 30. This change will be affected in our Market Systems and will enable our customers to better understand their usage patterns and change behaviours to reduce costs. Note: the costs associated with providing meter data at five minute intervals are not included in this business case.</td>
</tr>
<tr>
<td>
Affordable</td>
<td>Trying to support technology which has become too old can result in increased support costs and very quickly cost more than it would to invest in an upgraded system. Software vendor Itron has advised that if we do not keep IEE current, we will be charged an additional $250,000 per annum in support costs. Ensuring currency of our Market Systems avoids these risks and the associated costs.</td>
</tr>
</table>

Source: Powercor

3 Identified need

3.1 Problem statement

During the 2021–2026 regulatory period, vendors of our Market Systems will release new software versions approximately every two years. New software versions for Market Systems typically have improved stability–reducing the likelihood of system errors, improved security and new compliance related features.

For our Market Systems, our vendors will continue to support the previous version (N-1), however they will not support prior versions (N-2 or earlier). While under vendor support, the software is effectively under vendor warranty. This means the vendor has responsibility for fixing issues in a timely manner. As a result there is less disruption to our customers and market participants such as retailers and the AEMO and we do not incur the risk of the vendor denying support when issues arise or the cost of significant premiums for emergency support.

If our Market Systems were to fall out of vendor support they would no longer be covered under the vendor warranty. Should a failure occur in one of our Market Systems, this would put our business into a disaster recovery situation, where automated business processes could malfunction and data updates could be lost. The cost of disruption caused by unstable systems and software can very quickly outweigh the investment required to maintain a supported system. Table 5 below provides details on the key business activities supported by our Market Systems and the potential impact on customers and the NEM if business activity was compromised.

Further, our vendors also charge us an annual fee to continue to use the product if we go out of support. This annual fee does not provide us with any vendor support or maintenance service. Additionally, software on older versions also tends to have more bugs and stability issues and consequently increased operating expenditure would be required to address these.

If we do not upgrade our Market Systems to newer software versions during the 2021-2026 regulatory period, we would fall out of vendor support. This would increase the risk of system disruptions with consequential impacts on the NEM and our ability to meet our regulatory obligations. We would also incur additional operating expenditure for rectification works and vendor annual fees.

Table 5   Market Systems business activity summary

Business activity	Customer impact
Market transaction exchange with AEMO, Retailers and other market participants.	Retailer requests would not be automatically received and actioned requiring reversion to manual processes. Only priority 1 requests could be actioned. Compliance timeframes require same day action in relation to re-energisation requests.
	Customer requests for connection or changes to supply at premises are not received or actioned. Customer and Retailer information requests are not received or actioned.
	Retailers would not receive network billing and therefore would be unable to issues bills to their customers.
	High risk that life support customer information would be unknown resulting in a health and safety risk.
Collection, storage, processing and provision of interval meter data for 1.2 million premises.	Meter data could not be collected, stored or provided to retailers or the AEMO in contravention of data delivery timeframes we are required to comply with as a Meter Data Provider (**MDP**).
Collection, storage, processing and provision of manually read meter data for 40,000 premises.	Customers are no longer able access their meter data and take control of their energy usage.
	Retailer network billing and payments are delayed or not calculated or processed.

Source: Powercor

3.2 Desired future state

Our aim is to ensure that technical currency is maintained for Market Systems applications. This will safeguard:

- customer expectations – we will continue to provide a high level of customer service

- regulatory compliance - ensuring we are compliant with market rules which govern NEM participants and meet our life support obligations under the Distribution Code

- vendor support - minimising the risk of software issues arising and guaranteeing can we access core support 24 hours a day to quickly address issues that do arise.

Where possible, the business opts to defer a version upgrade for a longer period than formally recommended by the vendor, in order to minimise cost. This requires a pragmatic assessment of the likelihood of risks materialising. As with all IT assets, there is a degree of risk associated with lagging behind a vendor's recommended roadmap in Market Systems. However, upgrades may be postponed or missed where:

- vendor support for the current version is still available (this usually requires a formal, negotiated agreement and adds a significant premium to support costs)

- the current version is operating smoothly with minimal defects

- the costs to upgrade do not outweigh the risks of retaining current software version and the benefits associated with new functionality in the newest release.

To achieve our desired future state, we will need to perform vendor supported upgrades of the following Market Systems during the 2021–2026 regulatory period MTS, IEE, CIS-OV, FCS and Oracle Fusion. Our current business as usual approach to managing our Market Systems is to maintain software version of at least N-1 to ensure we remain within vendor support.

4 Options analysis

4.1 Approach

We followed a structured approach when analysing how various options could address our requirements over the 2021–2026 regulatory period.

Figure 2   High level approach diagram
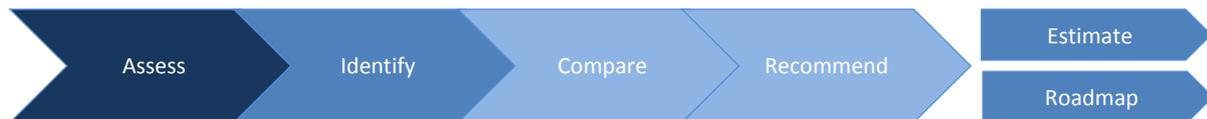
Source: Powercor

Assess

In defining the scope of this business case, we undertook the following sequence of activities:

- performed a comprehensive assessment of our Market Systems portfolio (current state assessment of applications)
- reviewed industry trends affecting the energy sector
- reviewed the history of past upgrade frequency.

Identify

Considering the set of applications within the Market Systems portfolio, we assessed potential options. We aimed to define an approach that would result in the best value for our customers. Also, ensure our ability to maintain a stable technology environment while aligning to our compliance requirements.

Compare

A comparison of options was performed on the basis of alignment to desired future state, cost-benefit analysis, reduction of risk to IT systems and business operations.

We also assessed the proposed options against our three themes:

- **Safe and dependable** – ensure the overall safety and stability of our services is not compromised.
- **Flexible** – maintain a flexible IT Market Systems ecosystem that can be easily adapted to changing requirements and customer expectations.
- **Affordable** – balance costs and benefits, while ensuring that the work performed delivers value to customers and the business.

To understand the potential impact of leaving our Market Systems applications in their current state over the 2021–2026 regulatory period, we defined and assessed a number of potential risks using our IT Risk Monetisation Framework. The result of this analysis is provided in Appendix C.

Recommend

Based on the outcome of the comparison, we recommended the option which delivers the best value for our customers, maintains the health and currency of our Market Systems and enables continued compliance.

In line with the portfolio and governance management structures outlined in our regulatory proposal, our recommendation also considered a number of general factors (e.g. project concurrency, resource availability, etc.) to ensure that the option selected and upgrade timing was pragmatic, actionable, and would have the highest probability of delivering a successful outcome.

Estimate and roadmap

The options were fully estimated using a bottom up approach that leveraged information on historical projects relating to the target applications, and information on projects of similar nature and scope. Our IT labour rate is based on PwC analysis of blended external IT labour unit rates.[6]

We developed a high level implementation roadmap based on vendor release schedules.

4.2 Summary

The results of our analysis against our three options is summarised in table 6. This table condenses the costs for each option over the 2021–2026 regulatory period and considers the risks involved in each option.

Table 6   Options outline, $m June 2021

	Option	Cost	Risk
0	Do nothing - do not upgrade to maintain current software versions in relation to Market Systems. Additional operating expenditure is charged by vendors	4.2	36.4
1	Prudent technical upgrades - remain within vendor support by adopting every second software version release upgrade	9.3	2.2
2	Vendor released technical upgrades - perform system upgrades as released by vendors, maintaining pace with newest available versions as they are released	11.4	2.2

Source: Powercor

We have not costed the option of obtaining third party support for our Market systems because IEE, MTS & CIS OV are off the shelf products owned by the vendor (Itron & CGI). The vendors are the only ones that can amend the source code and provide a release/fix if there is an issue as they own the code and IP for that product. Unlike customised products, our Markets systems do not lend themselves to third party support.

We have not costed the option of replacing our existing market systems with alternative products. This is because it would be a very expensive and high risk option relative to maintaining the existing systems. At a high level we would estimate at least $30m to replace IEE and MTS and around $50m to replace CIS-OV. Further there is no known alternative to MTS and any alternative to IEE would be an inferior product. We note that if we did replace our Market Systems with alterative products, we would still need to ongoing costs to maintain currency in line with vendor software version releases.

4.3 Option 0 - do nothing

Option 0 does not upgrade or maintain current software versions for our Market Systems and consequently fall out of vendor support.

Under this option we will not maintain the health and currency of our Market Systems. Vendor support of the critical software is not provided. Therefore, we cannot guarantee compliance with AEMO procedures or the Rules. There is also a high risk of critical process failures which will carry significant customer impacts.

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[6] See PAL MOD 12.02 - Quoted services labour rate - Jan2020 - Public

Trying to support technology which has become old and out of vendor support leads to in increased costs, which very quickly exceed the cost to invest in an upgraded system. Increased costs include:

- higher fixed vendor charges, for example, software vendors Itron advised we will be charged an additional fee of $250,000 per annum if we do not keep IEE current to an N-1 version. The total additional operating expenditure associated with vendor charges over the five year regulatory review period would be $4m.[7]

- higher labour costs to develop work arounds and develop fixes

- higher vendor charges for emergency support for rectification and to restore our systems to a supported version.

Option 0 therefore prioritises the avoidance of capital expenditure over the risks associated with non-compliance, product currency and customer experience and higher operating costs. This option carries a high risk of the Market Systems suite developing issues that cannot be rectified (or rectified in a timely way). These may occur by way of breakages in the existing software codebase or regulatory environment changes moving ahead of the current version's capabilities (e.g. like the recent Power of Choice changes), requiring additional expenditure to resolve.

Table 7 summarises the advantages and disadvantages of option 0.

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[7]   Further detail is provided in appendix D.

Table7   **Option 0 advantages & disadvantages**

Category	Advantages	Disadvantages
Safe & dependable		Software faults and bugs will not be rectified by the vendor resulting in increased disruption to our business operations.
		High risk of regulatory compliance breaches with associated financial penalties.
		Reputational business damage to our business due to regulatory non-compliance.
		Decreased visibility of life support customers.
Flexible		Product currency is not maintained leading to system instability.
		Software warranty is not protected once version end of life is reached.
		Improved software security associated with upgrades is not received.
		Lost product currency leads to compromised commercial vendor support arrangements and negotiating power.
		Lost product currency leads to complicated future product roadmap realignment.
		A failure of the Market Systems suite would: • render us unable to receive or action customer or retailer request for re-energisation and de-energisation • prevent us from resolving customer queries as Contact Centre staff depend on Market Systems to obtain customer or site specific information • stop us from receiving or action retailer information requests • result in customers being unable to access their meter data and take control of their energy usage.
Affordable	As this option assumes no investment, there is not any capital expenditure associated.	Additional operating expenditure over the 5 year period due to additional vendor annual charges each for IEE, MTS and Oracle Fusion.
		Retailer network billing and payments are delayed or not calculated or processed.
		Lost product currency leads to increased operational expenditure on defect patching.
		In the event of a system failure, the remediation cost is likely to be high assuming a lack of (or minimal) vendor support, and longer timeframes to analyse and deploy a fix.

Source: Powercor

4.4   Option 1 perform prudent technical updates

Perform prudent technical upgrades to remain within vendor support for our Market Systems by adopting every second version upgrade (N-1). This option reflects our current business as usual approach to managing our Market Systems is to maintain software version of at least N-1 to ensure we remain within vendor support.

This option maintains minimum currency on all core Market Systems applications, applying upgrades where deemed necessary, whilst delaying upgrades wherever possible, taking into account:

*   the number and nature of software defects resolved with the new release

*   the end-of-life status of the current software version

*   hardware compatibility with the newer software version
    (i.e. if a new release requires additional expenditure to ensure a compatible database)

*   the degree to which all of the above relate to regulatory compliance.

Compared with vendors of other systems, our Market Systems vendors release software versions less frequently and fewer features are provided in the upgrade. Our Market Systems vendors also continue to provide support and maintenance for the previous version (N-1). Therefore, we are able to effectively support our Market Systems software versions for longer without taking on significant risk.

Vendors release upgrades approximately every two years. Under option 1 we will undertake every second upgrade, with an upgrade approximately every four years. This means that the software version held by the organisation stays only one upgrade behind what is recommended and remains under vendor support (N-1). This approach ensures the systems keep pace with defect fixes and compliance features, albeit with a delay. For example, the previous IEE software version 7.0 was held over and migrated straight to version 9.0, skipping version 8.0 altogether. We deemed that version 8.0's features do not materially increase risk or compromise compliance.

Table 8 reflects the recommended application upgrade based on an N-1 approach proposed under option 1.

Table 8   Option 1 proposed upgrade schedule

Application	Target Cycle	Last upgrade	Update proposed 2021-2026
MTS	4 years	2017/18	2021/22 & 2025/26
IEE	4 years	2018/19	2022/23
FCS	5 years	2018/19	2023/24
CIS O/V	4 years	2019/20 (scheduled)	2021/22 & 2025/26
Oracle Fusion	5 years	2018/19	2023/24

Note: Each IEE upgrade has a dependency on the corresponding MTS upgrade, scheduled in the 1–2 years' prior.
Source: Powercor

Table 9 summarises the disadvantages and advantages of option 1.

Category	Advantages	Disadvantages
Safe & dependable	Product currency is maintained ensuring system stability. Software warranty is protected. Software faults and bugs are rectified by the vendor resulting in reduced disruption to our business units. Regulatory compliance maintained. Customer or retailer requests for re-energisation and de-energisation are promptly received and actioned. Customer queries can continue to be resolved promptly in the contact centre. Continued receipt and automated action in regard to the high volumes electronic market transactions (customer and retailer information requests).	
Flexible	Customers are able to access their meter data and take control of their energy usage. Ensuring prudent currency makes it easier than option 0 to adapt to changes in the technology landscape and evolving customer expectations around service delivery and changes to compliance requirements.	
Affordable	Avoids additional operating expenditure for maintaining an unsupported system which would be incurred under option 0. Lower cost compared to option 2 maintaining vendor-recommended currency. Strikes an appropriate balance between risk and cost.	Higher capital cost when compared to option 0 - do nothing.

Source: Powercor

4.5   Option 2 perform system upgrades as released

Option 2 involves performing system upgrades as released by vendors, maintaining pace with newest available versions. Typically, this approach would result in system upgrades occurring approximately every two years, or as per vendor releases. Complete currency and compliance would be maintained, however, the full value of each upgrade may not be realised and the resourcing load is high.

Table 10 sets out upgrade schedule for option 2.

Table 10   Option 2 proposed upgrade schedule according to vendor release schedule

Application	Target Cycle	Last upgrade	Update proposed 2021-2026
MTS	2 years	2017/18	2021/22, 2023/24, 2025/26
IEE	2 years	2018/19	2022/23, 2024/25
FCS	2 years	2018/19	2021/22, 2023/25, 2025/26
CIS O/V	2 years	2019/20 (scheduled)	2021/22, 2023/24, 2025/26
Oracle Fusion	2 years	2018/19	2021/22, 2023/24, 2025/26

Source: Powercor

Table 11 summarises the disadvantages and advantages of option 2.

Table 11   Option 2 advantages & disadvantages

Category	Advantages	Disadvantages
Safe & dependable	Regulatory compliance maintained. Product currency maintained. Customer or retailer requests for re-energisation and de-energisation are promptly received and actioned. Customer queries can continue to be resolved promptly in the contact centre. Customer and retailer information requests which are electronically sent by the retailer are received or actioned.	Cutting edge/untested software may introduce new technical defects. Organisational OCM fatigue/apathy–may result in process related non-compliances (even if technical compliance has been achieved).
Flexible	Customers are able to access their meter data and take control of their energy usage. Ensuring prudent currency makes it easier than option 0 to adapt to changes in the technology landscape and evolving customer expectations around service delivery and changes to compliance requirements.	High resourcing load required to implement–reduces ability to complete other elements in the programme of work.
Affordable		Higher cost than other options.

Source: Powercor

5 Recommendation

Based on the outcome of the comparison, we recommend option 1 perform prudent technical upgrades to remain within vendor support through adopting every second version upgrade. This option delivers the best value for our customers.

Option 1 is the efficient solution, as it provides a pragmatic balance between mitigating the most probable risks and deferring spend where efficient. It extends asset life beyond formal vendor upgrade release timelines while maintaining a supported version. It avoids the risk of incurring penalties or suspensions for regulatory non-compliance, as well as the direct risks to processes that support the critical, everyday activities and requests of customers, the business and the wider NEM.

Option 1 ensures we maintain the compliance standards which underpin several critical and customer-facing business processes, whilst ensuring maximum value is extracted out of each upgrade, and further upgrades are not implemented earlier than necessary. It aims to coordinate upgrades so that they are rolled out in an orderly manner, maximising resourcing and learnings from corresponding upgrades performed.

Risks associated with option 0 - do nothing were considered too high and the additional costs for maintaining an unsupported version are inefficient. The costs of option 2 - perform upgrades as released were considered unjustified and avoidable.

Table 12 provides the expenditure profile for our recommended option.

Table 12   Recommended option 1: expenditure profile, $m June 2021

IT capital expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	Total
CitiPower	0.4	0.4	1.2	-	0.8	2.8
Powercor	1.0	0.9	2.7	-	1.9	6.5
Total	**1.4**	**1.3**	**3.9**	**-**	**2.7**	**9.3**

Source: Powercor

6 Roadmap

A Market Systems roadmap showing planned application upgrades during the 202–2026 regulatory period is provided figure 3.

Figure 3   Market Systems currency roadmap: CitiPower and Powercor
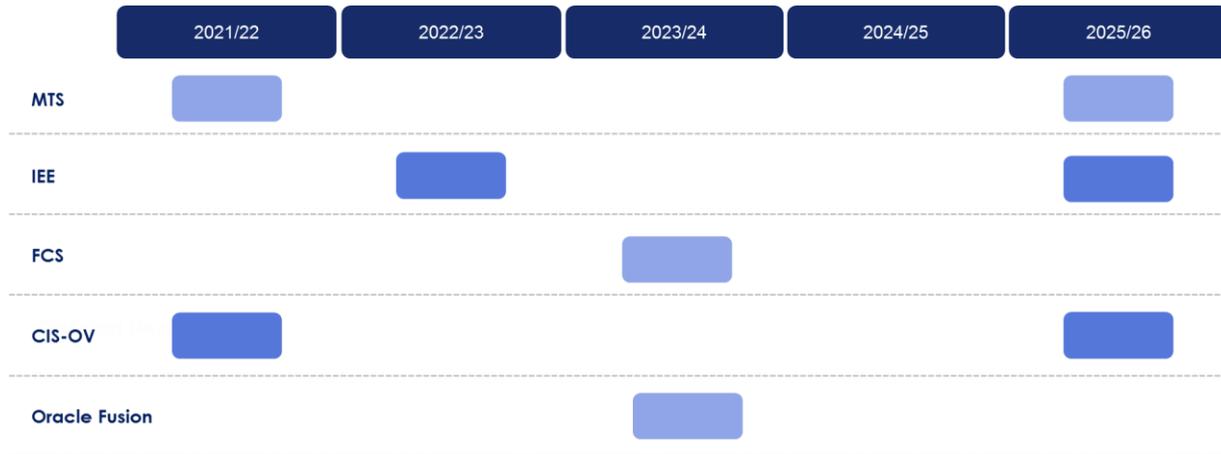
Source: Powercor

A Market Systems application summary

Table 13 provides information on the applications which comprise our Market Systems. It outlines the functionality provided by each Market Systems application. It also specifies the current version.

Application	Function	Description	Current version	Vendor
MTS	Manage communications with external market participants.	Ensures industry compliance on market transaction functions, including the delivery of meter data, network billing and market transactions via B2B and CATS transaction mechanisms. Underpins communications and data exchanges between the organisation and external market participants, including Retailers, meter data providers, metering providers and AEMO.	2.1	Itron
IEE	Interval meter data collection, storage, management and processing.	Flexible off-the-shelf platform that receives and processes interval meter data from the AMI meter fleet. Validated reads are sent to market to fulfil regulatory obligations and also passed to internal systems for network billing and collections. AMI meter fleet size: Powercor 875,000, CitiPower 335,000	9	Itron
CIS-OV	Customer information and relationship management, account management, billing and collection.	Specialised industry solution to support: • customer and retailer information management • creation of NMIs • billing and payments • meter management • management of remote re-energisation/de-energisation • accumulation (basic) meter data maintenance.	6.4.1.0240	CGI
FCS	Scheduling and management of manually read meters.	Mobile meter data collection software to collect and automate the transfer of data to and from devices supporting the manually read meter fleet. Meter data is sent either to the billing system or to IEE. Type 5 & 6 meter fleet size: CitiPower & Powercor: 40,000	3	Itron
Oracle Fusion	Integration layer (middleware).	Facilitates and controls routing of messages and transactions exchanged between IT applications within Market Systems and between Market Systems and organisational systems (e.g. SAP, Click).	12c	Oracle

Source: Powercor

Table 14   List of services supported by the integration layer

Essential customer services	Critical business processes
Customer requests for remote re-energisation. New connection, alteration, abolishment and solar pre-approval requests. Customer meter data requests, including verification that that requestor has data access rights. Customer SMS push notifications on supply faults. Customer demand management and load shedding event data feeds and coordination.	Fault management and planned maintenance work to field crews. Market information exchange between core market systems. Data feeds for Health and Safety processes. Updates to the Building Access system.

Source: Powercor

B Delivering on regulatory requirements

AEMO Regulatory Procedures

Table 15 shows how our Market Systems enable us to deliver against the AEMO regulatory procedures.

The Metering Procedures referenced in the table are prepared by the AEMO. The effective date of these procedures is 1 December 2017 unless stated otherwise. The corresponding Market Systems applications which enable us to delivery against the AEMO regulatory procedures are listed in the table.

Table 15   AEMO Retail and Metering Procedures

Retail and Metering Procedure	Procedure Category	Procedure	Market Systems Applications
Market Settlements and Transfer Solutions (**MSATS**)	MSATS Procedures	CATS Procedure Principles and Obligations Procedure for the Management of WIGS NMIs NEM Retailer of Last Resort (**RoLR**) Processes Part A and Part B Standing Data for MSATS MDM Procedures	MTS IEE USB CIS OV
Metering Procedures, guidelines and processes	Service Level Procedures	Meter Data Provider Services Metering Provider Services	MTS IEE USB CIS OV FCS
	Meter Data Provision Procedure	AEMO Meter Data Provision Procedure Effective 1 March 2016	
	Meter Data File Format	MDM File Format and Load Process Meter Data File Format Specifications NEM12 & NEM13	
	National Metering Identifier Procedure	MSATS National Metering Identifier	
Business to Business Procedures	B2B	Customer and Site Details Notification Process Service Order Process Meter Data Process One Way Notification Process B2B Procedure Technical Delivery Specification	MTS IEE USB CIS OV
Metrology Procedures	NEM Metrology	Metrology Procedure Part A Metrology Procedure Part B	MTS IEE USB CIS OV

Source: Powercor

C Risk monetisation summary

Table 16   IT Risk monetisation summary for recommended option

Risk Category	Risk Type	Description of Risk
IT Risks	Outage	A full Market System outage would mean we were unable to perform crucial market settlement functions. Continuing with support under our preferred option means we can expect low risk levels similar to that experienced today. When an outage has occurred in the past, we have been able to resolve issues on the same day and we have not had a full outage. However, without investing in currency as under option 0, a system-wide outage of Market Systems would be highly likely to last between 2 weeks to four months (if a full upgrade was required).
	Suitability	Suitability issues occur as a result of external changes meaning that while a system continues to work, it is no longer suitable to perform required functions. We undergo new compliance changes at least once a year (e.g. a recent example includes the new DER register). With full vendor support, the vendor is responsible for implementing these changes. However, the vendor will not make these changes if we are not on the latest version of their system. As these are out of the box solutions that do not allow modifications, we have no ability to implement the compliance change ourselves. Therefore there is no workaround in lieu of refreshing, so we would become non-compliant. These consequences are therefore captured as part of compliance risk.
	System Sustainability	System sustainability issues (defects) can occur from time to time in market systems. Without correcting them, they grow over time resulting in lost staff productivity. Under vendor support, system sustainability issues are rectified by the vendor. For example, Itron releases 'hot fixes' when they identify issues with the current system. While they issue fixes once every three weeks, we implement a patch set in bulk once every quarter for expediency.
Business Risks	Reliability Impact	An outage would mean we were unable to process new connections. However, when this issue has occurred in the past, we have been able to process the new connections on the same day, so that customer reliability is not affected.

Risk Category	Risk Type	Description of Risk
	Compliance Risk	We meet a number of compliance requirements through our Market Systems

This includes our energisation/de-energisation processes. When a same day B2B reenergisation service order is received by 3pm then we must action the order on the same day. We have two business days to action de-energisation requests.

Market Systems provides retailers and AEMO with meter data by 6 am the following day, in accordance with the data delivery timeframes specified by AEMO procedure as a Meter Data Provider (MDP).

Market Systems also underpins our connections process including to enable customers to:

- submit Alteration nor Abolishment requests

- submit requests for meter investigations or tests

- submit service orders for new connections.

However, given the short timeframe of outages suffered to date, there is low risk of non-compliance with mandated connection, meter data and energisation/de-energisation timelines. |
	Safety Risk	CIS tracks our life support customers (**LSC**) or other sensitive load customers (SLC). This information is used when planning an outage to ensure LSC/SLC remain connected and to prioritise their work orders. Network Management stores historical LSC information, but relies on CIS to provide updates of new LSC/SLCs. Therefore if CIS goes down and the details of a new LSC/SLC is not passed on and an outage is planned, then that customer would get disconnected with death as a potential impact. Given the number of new LSC/SLC added each week (around 150), there is a risk of this occurring while our system is down.
	Bushfire Risk	NA
	Financial Loss	If our Market Systems were no longer working, we would revert to manually processing energisation and de-energisation requests. However, when we suffered a 6 hour outage recently (as a result of underlying infrastructure issues), we were able to manually process the energisation/de-energisation requests during the same day with existing staff with no additional costs incurred.

Source: Powercor

D Additional support costs

The table below reflects the addition support operating expenditure which vendors are likely to impose if option 0 was selected and Market Systems currency was not maintained.

Table 17   Additional annual support operating expenditure, $m 2019

System	2021/22	2022/23	2023/24	2024/25	2025/26	Total
MTS[8]	0.25	0.25	0.25	0.25	0.25	1.25
IEE[9]	0.25	0.25	0.25	0.25	0.25	1.25
CIS O/V[10]	0	0	0	0	0	0
Oracle Fusion[11]	0.10	0.20	0.30	0.40	0.50	1.50
FCS[12]	0	0	0	0	0	0
Total	0.6	0.7	0.8	0.9	1.1	4.0

Source: Powercor

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[8]   Based on advice provided by Itron

[9]   Based on advice provided by Itron

[10]   CGI have advised that additional support costs would not be applicable.

[11]   Conservative estimate of $100k in first year, escalating by 100K for each year an upgrade is not performed. Based on the assumption that Oracle will continue to provide support at a premium rate rather than declining to provide any form of support.

[12]   Determined to be negligible