Jemena Gas Networks (NSW) Ltd

2020-25 Access Arrangement Proposal

Attachment 5.4

Information Technology Plan

Jemena Gas Networks (NSW) Ltd

Technology Plan

2020 - 2025

Jemena
bringing energy to life

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Glossary

Jemena	The parent company of Jemena Gas Networks (NSW) Ltd.
Office 365	Office suite if desktop systems

Abbreviations

AA	Access Arrangement
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AESCSF	Australian Energy Sector Cyber Security Framework
AI	Artificial Intelligence
ASD	Australian Signals Directorate
ASX	Australian Stock Exchange
CAM	Cost Allocation Methodology
CATS	Customer Administration Transfer Systems
CX	Customer Experience
ECC	ERP Central Component
ERP	Enterprise Resource Planning
IaaS	Infrastructure As a Service
IoT	Internet of Things
JEN	Jemena Electricity Networks (Vic) Ltd
JGN	Jemena Gas Networks (NSW) Ltd
MDMS	Meter Data Management System
ML	Machine Learning
MSATS	Market Settlement and Transfer System
MSI	Market System Integrator Application
NECF	National Energy Customer Framework
NGR	National Gas Rules
NIST	National Institute of Standards and Technology
NMS	Network Management System
PaaS	Platform As a Service
PMP	Project Management Plan
PSC	Project Steering Committee
RTS	Real-time Systems
SaaS	Software As a Service
SCADA	Supervisory Control and Data Acquisition
SCP	SAP Cloud Platform
STTM	Short Term Trading Market System
TCO	Total Cost of Ownership

Overview

This Technology Plan is one of a suite of documents being submitted as part of Jemena Gas Networks (NSW) Ltd (**JGN**) 2020-25 Access Arrangement (**AA**) proposal.

The purpose of this plan is to provide an informative view of the essential tasks we carry out to ensure that our systems remain sustainable, secure, and that we maintain operational safety at all times. In parallel with these objectives, we also explore opportunities to introduce new and innovative technology options to optimise how services are delivered to customers.

Over the last 18 months an extensive series of customer engagement sessions have been held and our customers have provided us with considered and insightful feedback which has been instrumental in the development of our proposal, but we have not received any specific technology related comment's upon which to act apart from ease of engagement.

Our gas customers have highlighted Affordability, Safety and Reliability, Fairness and The Future as the key themes for us to focus on. We have used these as key points when developing our plan to:

- Demonstrate customer value and benefits.
- Provide more transparency of how costs are incurred in the delivery of services.

We believe we are in a strong position to achieve these objectives following substantial effort over the previous two regulatory periods to establish a strong core platform made up of modern applications and highly virtualised infrastructure which provides us with a flexible and cost-effective level of technical capability. We have also ensured that we maintained a sufficient level of agility to manage new obligations such as customer data rights. We expect to continue maintaining and leveraging our core solutions where it remains prudent and cost-effective to do so, which is expected to be well into the next period.

We benchmark our performance against service providers in the market using the threshold criteria of best practice, prudent, efficient and cost-effective over the long term. This has been our preferred approach to considering alternative outsourcing strategies, especially when considering short term cost saving opportunities offered via outsourced service providers. Experience to date has shown that leveraging our depth of technical skills and internal capabilities has provided a more stable and predictable forecast and knowledge base when defining our technology plans and requirements.

Affordability and cost pressures across the energy industry weigh on us, placing pressure on us to find new ways of using technology to innovate and deliver more efficient outcomes for customers, or reducing IT costs where necessary. We are responding to customers' concerns about energy affordability, with our technology capital expenditure over the forecast period for 2020-25 is $107.2M[1] This represents a 10.3% reduction in expenditure compared to the actuals/forecast for this current regulatory period, despite upward pressure on expenditure driven by factors such as increasing cybersecurity risks and growth in customers.

Jemena (JGN's parent company) employs a shared services delivery model across its portfolio of assets, and in particular has a high proportion of technology which is common to its regulated gas and electricity distribution networks. This model allows Jemena to deliver even greater efficiencies for both regulated businesses due to the relatively fixed cost nature of IT capital expenditure being shared across a larger customer base than if the costs we incurred on a standalone basis. The sharing of systems is not always appropriate—or efficient—and therefore, to the extent system costs cannot be shared between multiple businesses, we allocate those costs to the specific network.

[1] Real 2020 dollars.

In conclusion, our objective for the next regulatory period will be to continue to build on our long term strategic capability and be ready to adapt as future technology quickly evolves, maintaining the quality of our services to customers and to achieve the vision set out by those customers who have supported us in preparing our Technology Plan for 2020 - 2025.

1. Introduction

1.1 Purpose and structure of this document

This document explains and justifies our proposed IT capex for the 2020-25 AA period to ensure our distribution system, and the distribution services we provide, remain safe, reliable and secure. This is necessary to ensure that we respond to our customers' needs and that our gas distribution services remain affordable. This document covers capex within the definition of software expenditure that the Australian Energy Regulator (**AER**) has previously applied (referred to throughout this document as **IT capex**), and applicable to the reference service provided by JGN. Capex, which falls outside the definition of computer and software expenditure (for example, expenditure on field telemetry equipment) is addressed in Attachment 5.1 to the submission. .

Unless otherwise stated, all financial numbers in this document are presented in real 2020 dollars. This document is structured and flows as follows:

- Introductory information about how this document relates to other IT supporting documents, the role IT plays in our business and how we are responding to the needs and expectations of our customers.
- The IT environment and the key industry trends that are impacting on our business.
- How we manage and deliver IT services.
- Our extended Technology roadmap from 2010 to 2025, together with our applications and infrastructure.
- Overview of our technology capex in the current period, 1 July 2015 to 30 June 2020, including against the respective capex allowances consistent with the AER's Final Decision for the period.
- The planned objectives and strategic themes of our IT capex forecast.
- Principles, processes, methods and tools that we have used to forecast our IT capex for the 2020-25 AA period.
- Proposed IT capex for the 2020-25 AA period.
- The governance framework that supports our IT capex and how we will source and deliver our IT capex program in the 2020-25 AA period.

1.2 Relationship to other IT supporting documents

This Technology Plan is submitted to the AER as part of JGN's AA proposal to provide information about our IT capex forecast for the next AA period. The plan represents a collective output of business and technology strategies, roadmaps, policies and standards that support the efficient running of the network business and technologies used to provide services.

A significant part of our IT capex is directed at maintaining the performance of our IT assets, to ensure they continue to allow us to deliver the services our customers expect. We undertake operational risk assessments with life cycle and capacity plans to identify when a system's risk profile may change for us to optimise the scope and timing of remediation solutions. Reviews are undertaken regularly to evaluate the performance of software and hardware; these evaluations consider the current level of performance compared to the expected service levels, the frequency of incidents or interruptions, end-user or customer response times when using a service along with many other key performance criteria.

We also consider the rate of expected growth in usage of a service which may include the number of new customer connection points, the number of users of a system and new or changed regulatory obligations that also occur

from time to time. Once performance evidence indicates the degradation of a service, then changes are planned and implemented to remediate the problem.

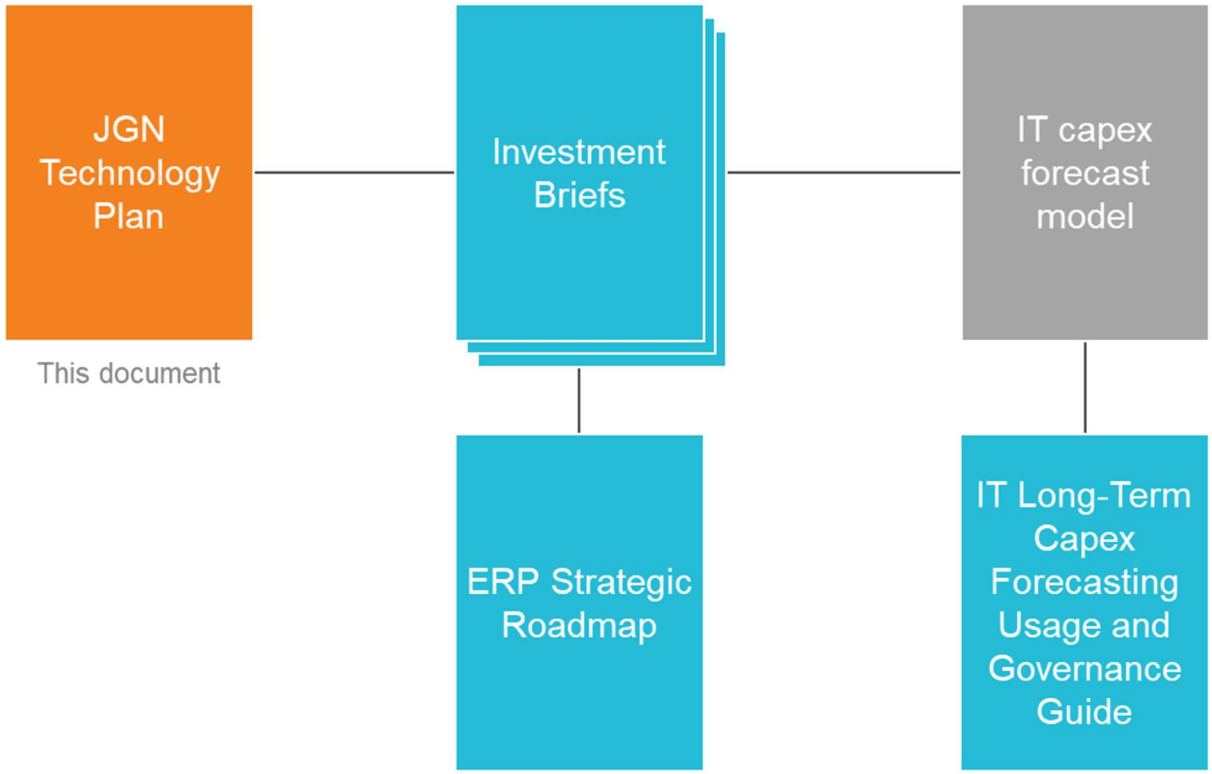
The Technology Plan is influenced by numerous internal and external inputs which are captured then assessed to determine whether a capability gap exists for any new or changed capability, or anticipated service level requirement. Examples of external influences could include customers and customer representatives, small business groups, large customers and retailers. Also we are also subject to changes in regulatory obligations that are a result of a directive from the Australian Energy Market Commission (**AEMC**), Australian Energy Market Operator (**AEMO**), Australian Competition and Consumer Commission (**ACCC**) and State Governments.

For internal influences, technology is classified primarily as an enabler of the business. Therefore investment requirements can be based on business requirements requested by teams with responsibility for the planning and delivery of services to customers. Jemena's IT group also contribute to the list of projects in the Technology Plan, with these changes primarily focused on technology infrastructure and operational requirements to ensure the state of the technology ecosystems remains fit for purpose at all times.

Regardless of the initiation source of a proposed technology change, a robust and standardised governance process is employed, including the establishment of business requirements, assessment of proposed timing and prioritisation, planning and financial approval—crucially, ensuring all investments made are in the long-term interests of our customers.

Figure 1–1 shows the relationships between this document and the other IT artefacts, which form part of JGN's AA proposal.

Figure 1–1: JGN AA proposal artefacts



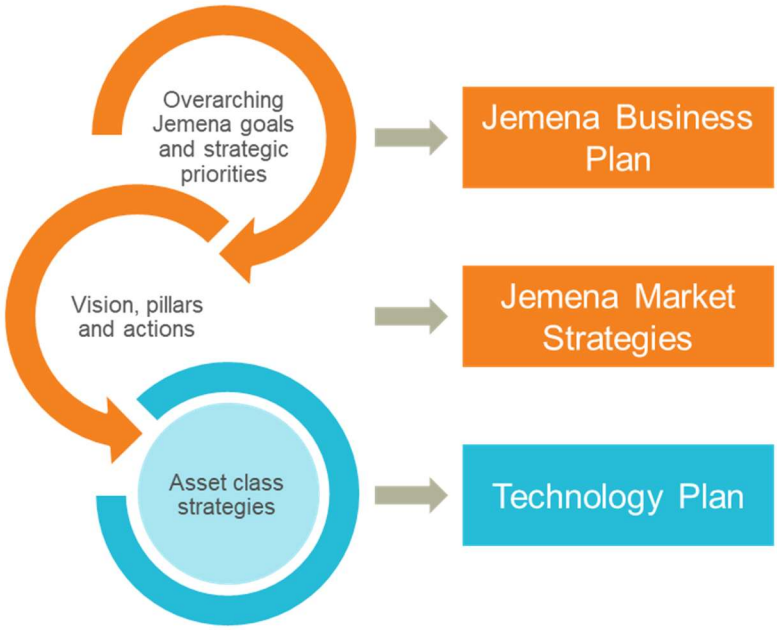
1.3 Relationships with other strategies and plans

In today's digital world, customers are demanding more from all their service providers than ever before. They expect a wider range of services, affordable prices, greater transparency to understand better their energy usage and engagement in a way and time that suits them.

Innovation is critical in meeting customers' needs. Innovation involves doing things differently, smarter or better, to create a positive change in value, quality or productivity. IT is critical to enabling these improvements as well as continuing to deliver a safe, reliable and affordable energy network to our customers.

As IT plays a pivotal role in ensuring we meet our customers' needs, this Technology Plan has been informed by and supports several other key artefacts within Jemena's corporate strategy and asset management system, as summarised in Figure 1–2.

Figure 1–2: Documents containing various corporate and asset-specific goals, pillars and objectives

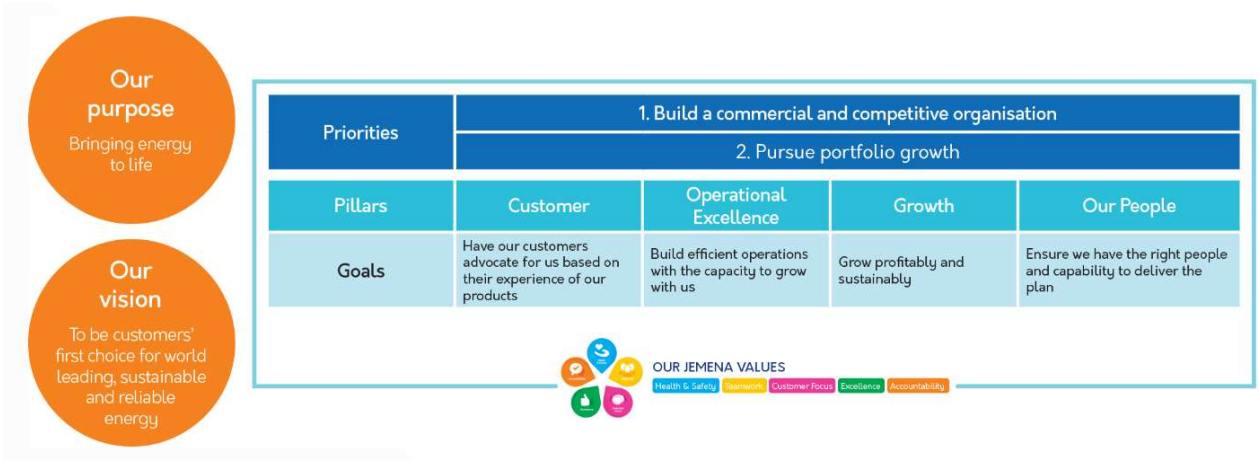


This Technology Plan supports the JGN business. JGN maintains an Asset Business Strategy, which outlines its asset objectives. These asset objectives are in-turn informed by the goals described in the Jemena Business Plan and gas market strategy.

1.3.1 Jemena business plan

The Jemena Business Plan sets out the highest order objectives, goals and strategy which inform our planning. Figure 1–3 presents an overview of the Jemena Business Plan.

Figure 1–3: Overview of Jemena Business Plan



1.3.2 The role IT plays at Jemena

This document forms part of our overall business strategy and transparency for IT capex investment and enabling technologies that support the provision of our gas distribution services. It enables us to:

- Align and deliver IT capabilities that enable business plans.
- Ensure timely provision of IT platforms that support future growth in the energy market.
- Ensure our operations are sustainable and our risk levels are appropriately managed, allowing us to broadly maintain our current levels of network service performance for customers.
- Provide cost-effective and fit-for-purpose IT solutions that address customers' concerns about energy affordability.

Our prudent and efficient level of proposed IT capex will ensure we can realise the ongoing sustainability of our IT systems and continue to deliver new functionality to maintain the safety, reliability and security of our distribution system and services to customers. Each proposed project and program of work within our forecast is necessary to either sustain our current systems or undertake upgrades to ensure they remain fit for purpose in a constantly changing technology and network environment where our customers' requirements and expectations continue to evolve.

Our proposed IT capex is efficient as it is based on leveraging investments already made in existing systems and gradually moving towards a mix of commodity-based industry-standard platforms. This strategy and approach provides us with opportunities to leverage and develop more synergies across the businesses within our group to provide economies-of-scale benefits from using common systems and platforms, reducing complexity and lowering total cost of ownership over the long-term.

1.4 Customers' needs and expectations

JGN commenced its engagement program in August 2017 with a series of focus groups for residential and business customers, as well as large user and retailers to develop an understanding of our customers' needs and expectations, and how best to engage with them. Customers were asked two key questions—how do you want us to engage with you and, what topics are important to you?

The engagement process identified four key themes:

- Affordability: we have heard that affordability is a key issue for our customers, and that network businesses have a key role in keeping prices down.
- Reliability: our customers told us that they value and expect a safe, secure and reliable gas service.
- Fairness: in the context of existing and future customers, the service levels that they receive and the different needs of our diverse customers from across the state. Keeping billing stable and smooth and looking after the disadvantaged.
- The Future: our customers told us that they expect us, and other parts of the energy industry, to innovate and plan for the future so that they can continue to use gas in the longer term, as we move to a zero-carbon future.

Our customers also told us that they were concerned about estimated meter reads and that they expect JGN to continue to investigate and manage issues surrounding meter read estimations, including technology solutions as they become available.

This exercise served an important purpose of providing some clear direction and guidance for technology investment areas to be incorporated in developing the Technology Plan. The outcomes now are that the next period submission technology plans have delivered an increased focus on better and simpler customer experience, demonstrated through an improved customer portal and additional services accessible via a multi-channel approach to suit each customer's preferences for how they want to access information.

The customer recommendations also went on to identify several other changes which have been addressed in the technology investment plans, these include:

- Improving accessibility of information on customer interactions with us from new connections through to billing.
- Improving customer service channels and services via simpler and multi-channel processes.

This feedback has been integrated into our IT planning process and used to develop the Investment Briefs that support our capex forecast.

2. Technology context

This section explains our current IT environment and the key industry IT trends that are impacting how we deliver services to our customers. From a technology capability viewpoint, our current architecture is both modern and progressive, providing a fit for purpose set of core technologies that ensure continued resilience in the face of a changing external environment.

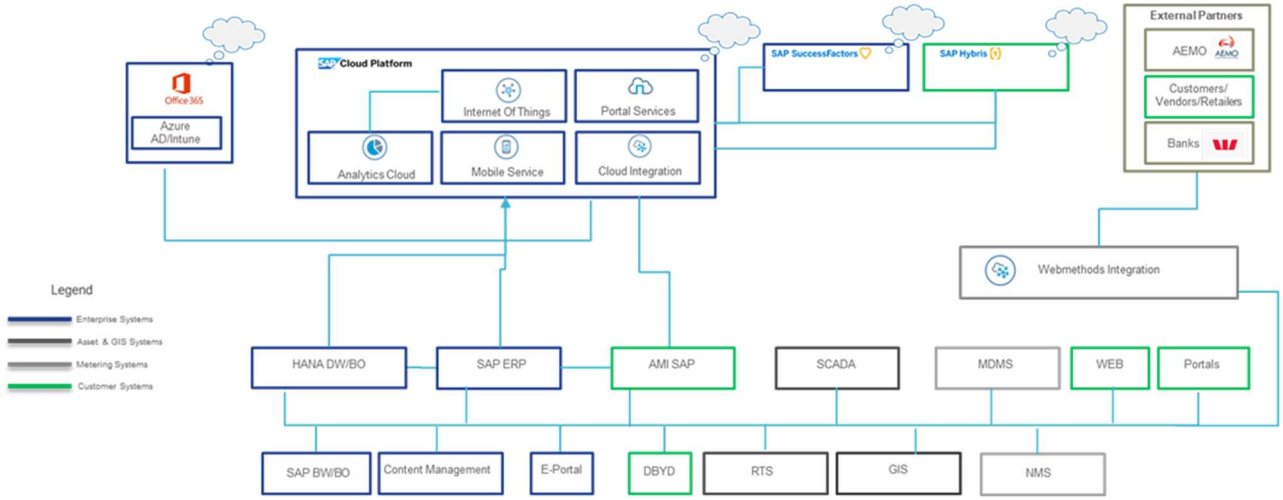
2.1 Our current IT environment

The IT ecosystem illustrated below provides a high-level snapshot of our technology approach. These core foundational blocks represent our current state technology view including enterprise resource planning (**ERP**), enterprise integration, content management, management reporting, asset and geospatial information systems (**GIS**), metering and network systems and corporate serving capabilities such as finance, human resources and procurement.

In line with good industry practice and following assessments of the most efficient platform options, we are increasingly utilising cloud-based services. The Office 365 (**O365**) suite provides end-user services such as email, collaboration, management reporting, active directory and device management services. Cloud platforms are also in place to support analytics, mobile services, cloud integration and portal services. Success Factors provides cloud-based services for HR management and employee training. A key component of our technology platform is our integration layer, which is provided by webMethods.

Reflecting our customers' concerns about energy affordability and their desire for us to largely maintain our current levels of network services into the future, our objective from a future state technology perspective is to achieve stability and minimise changes necessary to our systems. In developing our future state blueprint, we have used a simple principle of maximum re-use and leveraging of foundation systems while at the same time to deliver an improved customer experience. We elaborate on this technology change discussion further in Section 6 of this Technology Plan.

Figure 2–1: Our current IT environment



2.2 Industry trends

Energy and IT are facing unprecedented growth in the demand for the new capability. This section addresses some key areas of disruption and our plan to adapt to this new technology and industry change so that we continue to meet customer expectations and further improve the cost efficiency of our operating model.

2.2.1 Artificial Intelligence

The adoption of artificial intelligence (**AI**) in utilities is in the early discovery phase, and the level of mainstream adoption remains relatively low. The early AI use cases have focused largely on decision support – this means applying AI to deal with low value, high volume processing, and subsequently moving high-value resources to more value-added activities and exception management. AI capabilities are expected to drive business value and improved customer services; it is also expected to have relatively few obstacles to adoption. A key area of focus and measurement will be to ensure any avoidance of increases in costs to serve customers while further augmenting business processes to provide better services at a lower cost.

AI will require different skills and new technical resources to support the introduction of the technology but is expected to reduce net costs overall. Successfully delivering on AI opportunities, in particular, those initiatives which are small, focused and targeted, are the most likely to deliver efficiency benefits and improve customer responsiveness to standard processes.

Our current technology platforms already utilise some AI capability, which is running in the background on enterprise solutions such as Microsoft Azure (cloud analytics), SAP HANA (meter data system), SIEM Huntsman security system. These examples are expected to form the early basis for skills acquisition and building organisation maturity in the use of AI, as experience and confidence in the use of AI increase the next phase of development will be to focus on improving customer experience use cases. AI is acknowledged at times as being both a disruptor and an opportunity for innovation, and this is particularly true when it is used in combination with other technologies such as Machine Learning (**ML**).

2.2.2 Machine learning

ML is developing quickly from its emerging technology status into a mature technology. We will be continuing to examine opportunities to utilise machine learning in combination with AI and Analytics cloud platforms such as Microsoft Azure. The rationale for machine learning and its association with AI creates an entirely new paradigm when it comes to the interrogation of data and behavioural patterns across the distribution network. With the increased awareness and insights being provided through AI and for ML to act on those insights it is expected that operational responses will shift from being the rear window historical view to a forward-looking and pre-emptive management approach, which will go a long way towards achieving the level of sustainability of what we do, it ensures ongoing affordability from proactive rather reactive responses resulting in sustained reliability and resilience in operating the gas network. The customer-facing benefits which are also expected to occur from a union of AI and ML are that customer services will become far more context-aware and intuitive in customer interactions and therefore be more capable of resolving requests in the first instance.

2.2.3 Cybersecurity

Digitalisation has altered all elements of our day-to-day lives, and cybersecurity is a foundation of digital business and innovation. Organisations and individuals now have more access to information, communication options and an environment that adapts to the way people and organisations want to work and interact. This has created opportunities to evolve business models, better understand customers, create simpler processes and improve business efficiency.

However, these digitalisation opportunities are accompanied by threats. The rapid escalation of successful cybersecurity attacks suggests it is now even more likely that we will have to recover from a cybersecurity incident than any other form of IT disaster scenario. Our ability to recover using traditional corrective recovery responses (such as environment backups and primary and secondary data centres) has also become less effective in the face of the new threats. Furthermore, the storage of data in cloud-based environments creates additional challenges to manage security risks.

As an owner and manager of critical infrastructure which provides essential services to our customers, we must adapt to these new threats and ensure we implement cybersecurity solutions which create stronger, faster and more automated responses to cyber threats to protect the network, information and the safety of the community.

To date, we have undertaken a significant level of effort and activity to make our technology environments more resilient, so that in the event of an attack we are prepared and ready to restore services quickly and with minimal losses. Going forward, cybersecurity is a priority investment area in the next regulatory period as the consequences of a successful breach or incident continue to heighten.

2.2.4 Cloud technologies

Cloud solutions have become much more prevalent across multiple industry sectors in recent years, often due to the perception of cost reduction and vendor technology roadmaps driving towards greater cloud adoption. Jemena has been cautious in its progress towards the number of cloud service capabilities used to support its processes and environments.

During the current period we have successfully undertaken some major migration activities with Microsoft Office Suite (**Office 365**), Microsoft Azure platform and the implementation of SAP Cloud Platform (**SCP**), and by way of example, SCP is now used to host a range of services including field mobility services, HR processes such as recruitment, employee central, cloud analytics, employee training and cloud integration.

This technology will continue to be extended to support the majority of new workloads underpinning the way services are provided to the business and customers. Similarly, the migration of on premise-based Microsoft Office Suite to the cloud-based Microsoft Office365 and Microsoft Azure platform was completed in 2018. We continue to monitor the maturity of office suite solutions as cloud technology develops further, and, in line with our governance processes, will consider alternative options at the expiration of our current agreements relating to this service.

Based on the current speed of transition and technology changes, we expect to be using a combination of hybrid cloud services to deliver the majority of services for our business by 2025. The main exception to this trend is expected to be the continuation of on premise-based solutions to support Real-Time Systems (including SCADA) managing the distribution network.

2.2.5 IT Support for Internet of Things

The rapid evolution of the Internet of Things (**IoT**) is driving more demand for integration to support and augment network management. From a network asset management perspective, many physical assets are required to deliver our services to customers. IoT provides new opportunities to improve the level of monitoring and management of the network by employing remote, smart devices.

To ensure that we can maintain control over core operations and maintain an ability to integrate seamlessly with IoT devices, we need a new approach to how the technology stack is developed and managed. Security implications are another consideration with any IoT integration, as each new type of technology represents a different potential attack vector to the network. Defensive solutions need to be in place to ensure the ongoing security and resilience of the network is maintained without creating additional cost and technical debts associated with legacy infrastructure. Technology debt is also a consideration with our choice of telecommunications networks. As the roll out of 5G networks gets closer, the choice of the communications network to support IoT devices reaches another level of maturity based on 5G, as it has been architected to support IoT devices.

While the ability to develop a body of knowledge from IoT sensors has been slowly occurring over the last few years, there are always limitations in what control systems such as SCADA can do in response to monitored signals. Historically the gathering of data has traditionally only resulted in the offline analysis without integration into the rest of the business processes, and this has the effect of slowing down the extension of IoT data into further business use cases. A new stack of control systems, pattern analysis, monitoring tools and analytics are

likely to be required to exploit the value that IoT can bring. Fields such as power distribution are very traditional when it comes to control systems, so IoT is still seen as a source of data for statistical analysis rather than a component of the core operational business processes.

IoT maturity will fully come of age in the next period, and we must, therefore, be ready to integrate and embrace opportunities where efficient to do so.

2.2.6 Digital platforms

The term 'digital utility' can be understood to refer to several types of systems working in unison to support the future business aspirations of a utility business. These foundations, or building blocks, are:

- Information system – this underpins operations and back-office functions (e.g. ERP, Content management).
- The customer experience (**CX**) – this involves customer facing and multichannel customer apps.
- Data and analytics – this involves managing data and analytic workloads and providing support for data-driven decision making.
- IoT – this involves connecting/integrating physical assets for monitoring and data collection.
- Ecosystems – these create and connect to external systems, marketplaces and communities, API management, control and security/permissions have established most of these core platforms over the last several years.

Our main technology platforms focus areas in the next regulatory period will be to prioritise the further augmentation of CX and to provide further support for ecosystems integration to support more opportunities for product innovation and better customer engagement through the web, mobile or even conversational interfaces such as Amazon Alexa, iOS Siri or Microsoft Cortana.

3. How we manage and deliver change

3.1 IT operating model

We, alongside our related regulated business Jemena Electricity Networks (Vic) Ltd (**JEN**), are supported by a shared enterprise solution and a domain-specific dedicated technology solution for the Jemena group. The use of this shared IT service model for providing and delivering IT services is a key enabler of the high-quality technology solutions across Jemena. It delivers cost efficiencies from economies of scale through sharing capability between the Jemena group's assets.

Efficiencies are achieved through enterprise level service agreements, which provide more than just volume discounting. Further benefits include enterprise support services and access to global research and development investment made by our strategic suppliers. Leveraging global research and development provides us with a means to access innovative services and opportunities which improve efficiency and better enable us to provide new services to our customers based on global trends and rapid technology advancement. We allocate costs between our assets in accordance with the Jemena group's Cost Allocation Methodology (**CAM**). On a regular basis, we assess alternative IT operational support and service delivery models; this allows us to ensure that ongoing expenditure for items such as annual maintenance remains at an efficient level.

3.1.1 Maintenance support planning and strategy

Maintenance and support planning (which is incorporated into our forecast operating expenditure) is a critical part of effectively managing our technology assets and ensuring they best allow us to deliver the services our customers expect at the lowest cost over the long-term. Maintenance and support agreements can involve material expenditure. Therefore Jemena considers the value and benefits associated with support agreements—and their potential alternatives—on a case by case basis.

Jemena's approach to the management of IT assets is to ensure that all critical systems have vendor support available unless alternative support arrangements (such as in-house support capabilities) are in place. For this reason, it is important to also consider system lifecycle replacement planning in conjunction with planning for support and maintenance arrangements.

An example is presented in the box below of our recent considerations around future maintenance, support and lifecycle planning in relation to our ERP system.

Example – maintenance, support and lifecycle planning for Jemena's ERP system

Our ERP system is the most critical application we manage, and its maintenance and support costs are the single largest of any of our IT maintenance agreements—ERP support and maintenance costs are of a similar magnitude to those of our next five largest suppliers.

This example provides some contextual background information on our lifecycle planning for this system (given the interlinkages between lifecycle and maintenance and support planning) and sets out several considerations in relation to maintenance support options. These provide some guidance into decision making, with the observations noted based on historical information and a recent Gartner report[2] outlining key arguments for and against how a decision can be reached on whether maintenance agreements are the most efficient option to employ when planning to minimise the total lifecycle cost of providing the necessary ERP functionality required by the business.

Background

Our strategy and planning approach for ERP support (as it does for any system) focusses on optimising cost efficiency, managing risk and ensuring services to customers are not adversely affected.

[2] What to consider before cancelling your ERP Vendor's Maintenance and Switching to Third Party Support [G00316405]

Jemena currently has a support agreement in place with the vendor of its ERP system (based around the on-premises SAP ERP Central Component (**SAP ECC**) software). Vendor support for SAP ECC has been announced as ending in 2025[3]. However there is continued speculation in the market that SAP will extend support arrangements for this product until 2030, with peer and user group pressure has previously seen the end of life of vendor support move from 2020 to 2025.

At the end of the vendor's support period, Jemena would need to either:

1. Take no action, which would involve bearing significant risks associated with the operation of a critical system without support arrangements in place (not a viable option for an ERP system)
2. Make alternative support and maintenance arrangements
3. Upgrade to a newer system which does have vendor support available (this could involve implementing either a later version of the system we currently have in place or re-architecting and shifting to an alternative system).

For a system this critical, taking no action (i.e. operating without support and maintenance arrangements in place) is not a viable option. Similarly, an eventual upgrade (or moving to a different product) is unavoidable.

Lifecycle planning

We are considering additional solution options as the end of life for this system approaches to provide further flexibility in how ERP capabilities are sourced and delivered. In the future, this is likely to involve a staged approach to system upgrades and elect to integrate with more light-weight non-SAP solutions for capabilities where it makes for a more cost-effective and less complex system to support. From a holistic viewpoint, our approach and current phasing are based on:

1. Current period activities include the implementation of a human resources module (SAP Success factors), SAP HANA (Data Warehouse), SCP (SAP Cloud Platform) along with an upgrade of SAP ECC6 to Enhancement Pack 8 (EP8),
2. Next regulatory period activities involve migration of Finance, HR and Procurement modules to SAP/S4, and
3. Subsequent regulatory period activities will address the next steps for Asset Management/Works Management.

However, given the long timeframes involved in changing or upgrading such a critical and complex system, we still assess opportunities to reduce cost by considering whether alternative support arrangements can be utilised in the interim until a new system is in place.

Maintenance and support planning considerations

Jemena currently has several significant IT change programs planned, meaning that over the next few years we will need to continue to manage through an extended period of system stability change management challenges which is normal with complex IT environments. Although Jemena has an internal SAP support team which could sustain our ERP under a 'no or minimal change' scenario, this is unlikely to meet our true operational needs in an environment where the level of change remains constant. Based on our current lifecycle planning for SAP ECC, this leaves the possible windows of opportunity to operate without a maintenance support agreement as small, and therefore the costs and risks of doing so are likely to exceed any potential benefits.

Further undermining any value proposition of operating this system without support is the extent to which new services have been established under cloud-based services, which reduce opportunities to avoid procuring maintenance and support services.

The table below provides a simple view of some evaluation processes that need to be assessed in determining the benefits of maintenance agreements. Outside of the scenarios listed here, there are a further series of questions and key criteria assessment that must be evaluated including commercial, insurance implications and system security. Risk management plays a key role in ensuring IT systems are well managed, and customers and the business are not exposed to unnecessary risk.

[3] https://support.sap.com/en/offerings-programs/strategy.html#section_1610563356

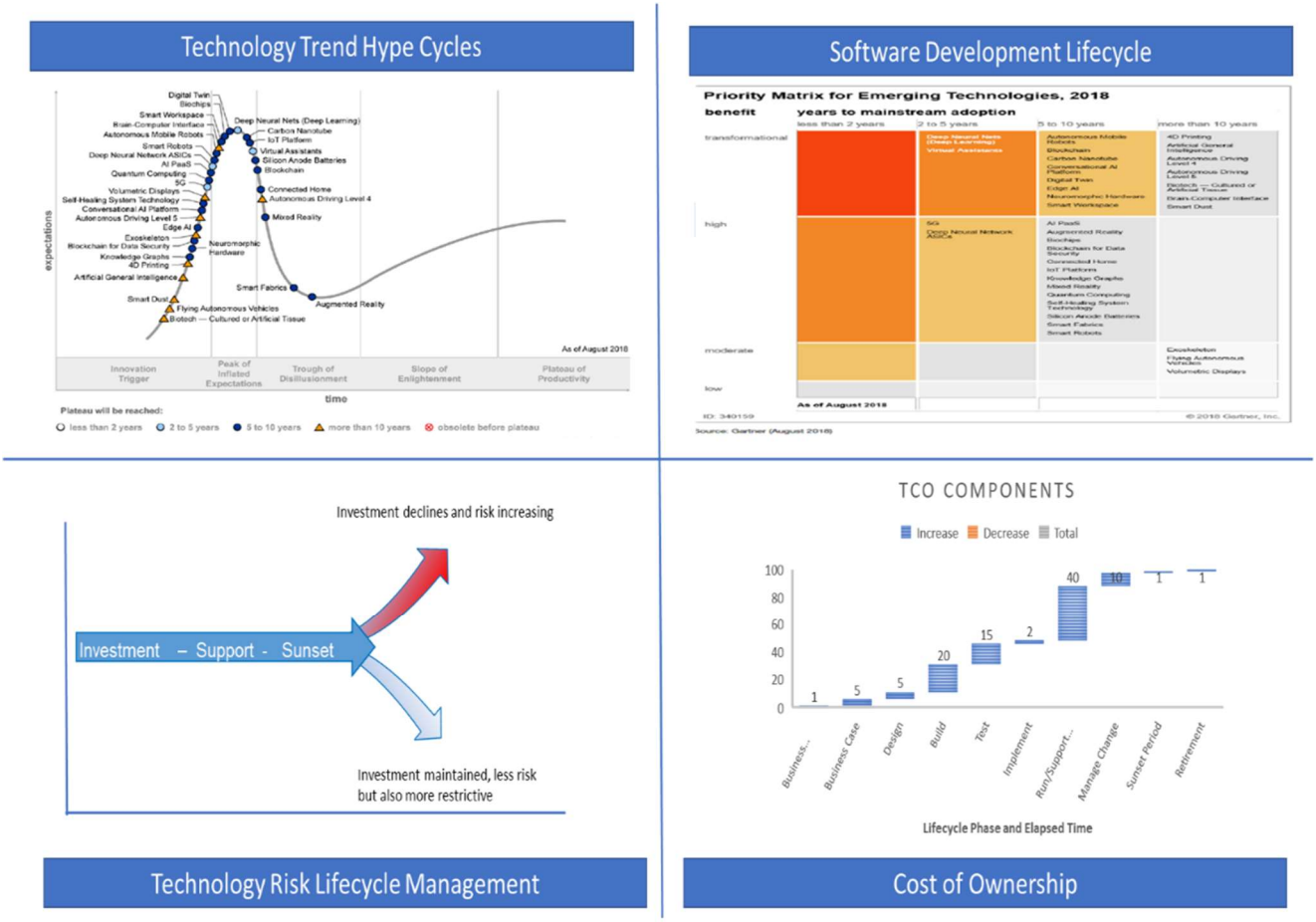
Consideration	Maintenance support planning implication	Summary observations
Jemena has a highly customised environment	May be viable to cancel vendor maintenance support agreement	Vendor support may be less beneficial as specific customisations mean we no longer adhere to standard configuration conventions. The acceptance of constant new releases represents change risk, high regression testing costs, and can increase complexity for often little or no value.
Non-current software and no plan to upgrade imminently to next major version	May be viable to cancel vendor maintenance support agreement	If the business expects to be in an extended period where no changes are required, and it accepts that any future upgrade path will be based on a full re-implementation (not just smaller incremental upgrades), the cancellation of support agreements may have some benefits. If Jemena elects to migrate to S/4, it will require a full reimplementation as SAP does have a conversion tool migration path to S/4 from our current system.
The decision to switch vendor or to re-implement system (i.e. major upgrade) for a future release has been made	May be viable to cancel vendor maintenance support agreement	A future market test may identify a viable ERP alternative and if the decision to switch was made the level of support required from the vendor would be adjusted to reflect change freeze and diminishing level of support over the balance remaining support period. If Jemena remained with the current vendor and the next upgrade required a full re-implementation of the code base to upgrade, then consideration of the timing of the move may determine an adjustment of the support period.
The software has been recently upgraded	May be viable to cancel vendor maintenance support agreement	The software has been recently upgraded; however, the end of declared support will require a decision to be made in the next regulatory period.
Jemena generally employs a 'trailing' strategy of being behind most current releases	May be viable to cancel vendor maintenance support agreement	This strategy has been followed over the last decade, however, we are beginning to move towards a more modern SAP landscape with our recent implementations of CRM, Success Factors (HR), SCP (SAP cloud platform) and SAP HANA BO.
Existing platform suits business requirements, no driver for change	May be viable to cancel vendor maintenance support agreement	The current configuration is viewed as overly complex and would benefit from simplification, level of agility does not match with business expectations.
New desired functionality coming in short to medium product release timeframe	May not be viable to cancel vendor maintenance support agreement	The valid scenario for Jemena with CX (multi-channel services) becoming more prominent in planned releases.
Software is new and still being patched and finalised by the vendor	May not be viable to cancel vendor maintenance support agreement	As per the section above, many of our new services are cloud-based services and leading-edge software.

Business support team frequently uses services included in a maintenance agreement and services not readily available elsewhere	May not be viable to cancel vendor maintenance support agreement	SAP has a broad breadth of services, and we work closely with them in a strategic partnering style relationship – access is provided to premium services in critical periods, meaning when we experience a critical problem we can engage with global specialist experts on a 24/7 basis to escalate and achieve fast resolutions.
Business preparing to make a business model change or change software, the system is unstable and needs to be stable before any shift	May not be viable to cancel vendor maintenance support agreement	Business transformational exercise is halfway through a project plan, further major changes planned over the next 12 months.

3.2 IT asset management approach

We have many categories of software under management to support our operations and the delivery of services to customers. The use of each technology requires a degree of management/maintenance to ensure that each asset can achieve its full serviceable lifespan, or even beyond if warranted, before its eventual replacement. Figure 3–1 outlines key factors we consider when determining the most efficient balance between cost, risk, resourcing and value to customers over time in our approach to managing our IT assets.

Figure 3–1: Key factors considered in IT asset management



Which show respectively (clockwise from top left) that:

- Technology trends (solutions) have a lifecycle to their market development and adoption.
- Individual products have a lifecycle to their development and take-up.
- The largest component of the Total Cost of Ownership (**TCO**) of a system is running/supporting it.
- Risk changes as products go through their lifecycle and that risk continued investment and flexibility play off against each other.

3.2.1 Developing new IT capabilities

We grow our IT capability by acquiring, developing and implementing new solutions to meet a need when we are unable to meet the requested need using an existing system or technology. The decision to implement any new capability is subject to a particularly high level of rigour due to the potential additional ongoing support and maintenance cost implications of investments in new assets.[4]

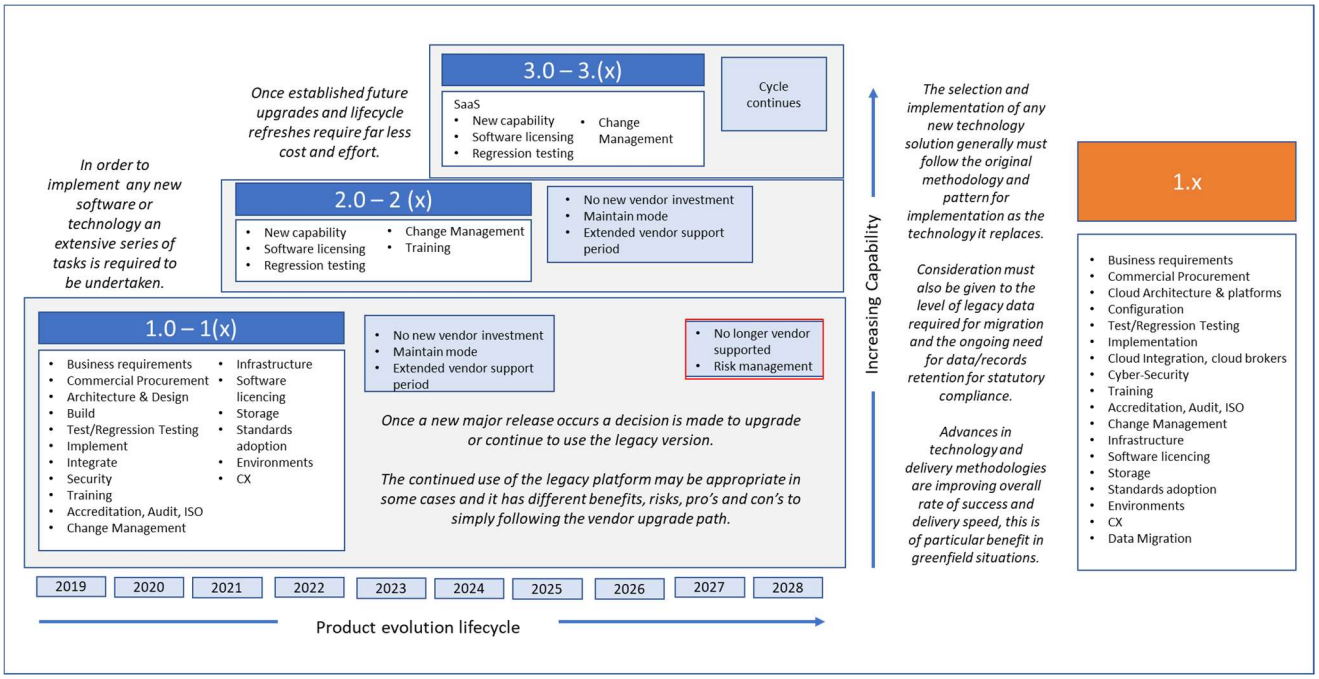
Before making a final recommendation for the implementation of a new capability, several alternative options are developed and tested to determine which option can deliver the best outcome. This will include the conceptual testing of each of the available options, including how further augmentation of legacy technologies and other alternative solutions might meet the identified requirement. These steps are important to ensure that the proposed solution is the most efficient option in the context of our overall IT environment, and therefore that it minimises the inefficient creation of 'technical debt' and new technical complexity that could result in higher costs over the long-term.

To support any new capability or new technology, a preliminary gap analysis is conducted to determine if we have access to appropriately skilled technical resources to support the new capability. This forms part of the overall general assessment to ensure that from a solution, operational and commercial perspectives that there are clear and measurable benefits for the customer and the business.

As noted in Figure 3–2 below, the implementation of any new technology solution requires a significant level of effort to become a production platform and to be fully integrated into the business ecosystem. It continues to be upgraded over several years with fixes, and new stability focused releases. There comes a time when vendors then move to develop the next iteration of the product and further R&D in the original release discontinues. To maintain currency or take advantage of new product features, we may elect to upgrade as incentives generally make the cost of upgrade more palatable. In cases where we elect not to upgrade and remain on a legacy version, either a full reimplementation or shifting to a new software provider for full implementation is generally required at a later stage. The option of undertaking incremental upgrades (rather than a replacement) generally represents a much more cost-effective as the change management effort is considerably smaller, and customer and business disruption is minimised.

[4] To support any new capability or new technology, a preliminary gap analysis is conducted to determine if we have access to appropriately skilled technical resources to support the new capability. This forms part of the overall general assessment to ensure that any proposed investments in new IT capabilities provide clear benefits in customers' long-term interests.

Figure 3–2: Determining Lifecycle Change Cycles example



3.2.2 Expanding IT capabilities

We expand our IT assets and capabilities to meet required:

- Natural growth in IT capacity, software licenses and new users for existing systems.
- Changes in capacity to provide for new systems.

Over time, growth may be driven by factors such as increasing customer numbers and increasing usage of IT systems, particularly their information and data.

During the current AA period, JGN has implemented a new GIS system transferring from a paper-based approach to a digital solution and replaced its SCADA/Real-Time Systems environment all of which require processing and storage/backup capacity.

3.2.3 Asset upgrades

Generally, we ensure that all market sourced products maintain access to vendor support. There are limited exceptions where a vendor may go out of business, or a product has no viable replacement. In these situations, we elect either to support a product by in-house means or by a third party agreement while we search for a replacement.

The timing and frequency of upgrades of Software as a Service (**SaaS**) or Infrastructure as a Service (**IaaS**) - based products are now measured in months, not years. Notification of an upgrade is provided by vendors, and Jemena must perform primarily automated regression testing in line with the products published release cycle. In some cases, an upgrade may be declined, which requires us to fully update based on the next product release to remain current. If multiple versions are not performed, then a full reimplementation of the product is required, therefore becoming a higher cost and risk activity.

This Technology Plan seeks to ensure systems are maintained in good working order and that versions are not more than two releases behind the current version. This requirement is frequently driven by the supplier's support contracts with most vendors providing support only for the most recent releases and dropping support for prior versions with each new release. Each upgrade is subjected to justification and priority-setting through an internal business case and risk assessment before being approved.

Software application assets are generally upgraded based on three to five-year cycles depending on the application and product lifecycle of the vendor in terms of the frequency and nature of the upgrades.

Generally, IT Infrastructure assets are replaced rather than upgraded for the following reasons:

- The economic business case makes replacement more cost efficient once warranty periods expire.
- Risks associated with performing an in-place upgrade often outweigh any benefits gained. Systems are often an integrated combination of hardware and layered software, where replacing the system as a whole becomes more desirable than piecemeal approaches to upgrades.
- Risk mitigation leading us to rectify software flaws and ensure continuity of vendor support.
- Meeting new regulation requirements through changes to the software made available in the upgrade version.
- Gaining access to new functionality and features to be applied internally.
- Cost avoidance, where not upgrading, increases maintenance and support costs.
- Where other parts of the solution ecosystem shift to a higher standard of systems requirements, and it is technically necessary to be compatible with a total systems' solution.

3.2.4 Asset replacement

As technology changes are constant, we look to ensure we adopt change or replacement periods, which consider the optimum time for upgrade or replacement based on historical experience and serviceability of the technology components. Doing this involves consideration of where a technology is placed from a maturity perspective—is it still on the rise of the inflated expectations, or has it now matured into a valuable technology or business solution?

3.2.4.1 Asset sustainability and condition assessment

IT assets do not tend to deteriorate rapidly when they are managed within controlled environments, such as a data centre, where environmental factors can be closely managed. However, items such as mobile technology devices, mobile phones and assets exposed to the elements do have factors that can shorten their serviceable lives.

IT asset health assessments are based on the asset's ability to be economically efficient, continue to meet performance standards as well as supporting growth suitability to adapt to changing business needs. The IT asset's condition is benchmarked and assessed based on the following criteria:

- The operational stability of the product, based on the number of times and duration it cannot operate.
- The ability of the product to meet operational performance standards, particularly growth in volume as the business grows.
- The ability of the product to service the business as intended by being fit for purpose.

- The ability of the product to be maintained and supported by the vendor and the supply of skilled market resources, in terms of availability and economic cost.
- The economic condition, being the cost to operate changes, in terms of increasing maintenance costs as the system ages, including when compared to replacement or alternatives.
- The number and severity of defects requiring remediation.
- The frequency of defects or defects recurring, resulting in loss of productivity and efficiency.
- The number of service calls relating to operational problems.
- The current ability to meet ongoing business working environment and changes, causing the product to become obsolete or to be made redundant.
- The physical condition, including damage and natural wear and tear.

3.2.4.2 Replacement drivers and cycles

IT asset replacement is generally required when:

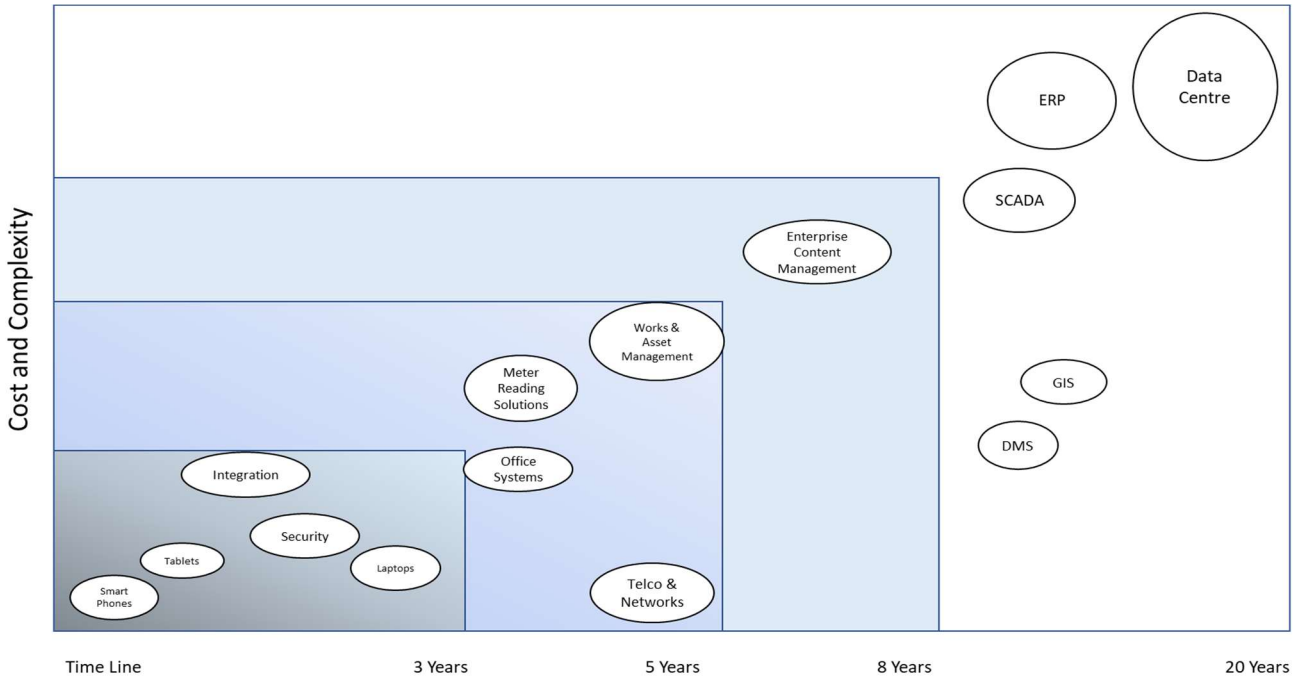
- It is no longer economic to keep an asset, compared to replacing it with a new version, as maintenance costs will continue to increase once it is deemed to be an aged asset for vendor support purposes.
- The technology vendor no longer supports the product because it is too old and costly to maintain. Increased costs occur due to lack of accessibility to support resources, with the technology skill set, plus higher costs to maintain legacy operating systems and hardware. This, in turn, represents an unacceptable risk to our ongoing delivery of services to continue operating the asset.5
- The asset can no longer expand or be extended to match business growth and demand usage.
- The asset can no longer be upgraded to support necessary changes to other systems on which it is interdependent—examples include an operating system, hardware and network environment compatibility issues.
- The security of the service or product cannot be assured, and it presents a potential entry point vulnerability or exposure to a security breach.

Figure 3–3 illustrates our high-level view of timing for key lifecycle management activities for a range of assets, with this view, also reflected in our policy driven process for maintaining IT services.

These lifecycle replacement periods are based on good industry practice; these guidelines help us to ensure that we remain focused on managing our technology assets managing the risks associated with operating a legacy technology continues until the time it is no longer prudent or efficient to do so. This view also reflects an ‘active follower’ approach rather than a leader in the adoption of accelerating (less mature) technology solutions, with our approach being generally more likely to represent the optimal efficiency of asset replacement timing.

5 We assess the risks associated with operating products without support arrangements on a case-by-case basis. There are a limited number of systems where we have determined that the most efficient option is to manage them without support, based on our assessment of the risks associated with failure of the system as low (i.e. unlikely to result in service interruption to customers, breach of market service level obligations, data loss etc.).

Figure 3–3: Lifecycle replacement planning



As new cloud services such as **SaaS**, Platform as a Service (**PaaS**) and **IaaS** emerge, we anticipate that by 2023 the rate and frequency of small to medium-sized technology solutions will see a significant reduction of 'lumpy' system upgrades or replacement projects, these will instead be upgraded via smaller and more frequent incremental projects. The migration of major enterprise solutions such as ERP, GIS, SCADA, Metering and Content Management are also expected to reduce in duration based on technology advancements which provide superior and faster transition pathways.

3.2.5 Asset retirement

All IT is subject to end-of-asset life replacement or retirement. This will typically occur when vendors declare an end to the support period where they will no longer offer to support a product, and alternative support is either not available or uneconomic. Equally, replacement or retirement can be triggered where an economic justification can be made where the cost of retention is greater than the cost of replacement.

4. Our IT architecture

This section provides a high-level transition view our Technology roadmap between 2011 and 2025, a small number of strategy and lifecycle tasks have also been included for the 2025 – 2030 period. This technology roadmap reflects the key systems (IT applications, infrastructure and data) we require to deliver services to our customers.

4.1 Our IT roadmap

Our technology roadmap includes historical information and a view of our proposed key technology changes over the medium term. This extended timeframe has been used to demonstrate how the technology landscape has transformed over the last decade and what that means to our future state view (including that which is beyond the next five year regulatory period).

Over the last two regulatory periods, Jemena has been following a strategy of cost reduction through rationalisation and technology consolidation, and throughout this period we have also sought to create a less complex and more generic set of technologies and platforms. This has been objective has been greatly assisted by a strong governance framework and increased rigour in our commercial processes.

Our technology transformation program has been conducted in parallel with us implementing major compliance programs relating to obligations such as the National Energy Customer Framework (**NECF**). Our strong and stable core platforms will enable us to avoid any (otherwise unnecessary) replacement of existing technology solutions for compliance projects and, instead, allow us to meet these new service level obligations using planned lifecycle upgrades and augmentation of existing capability.

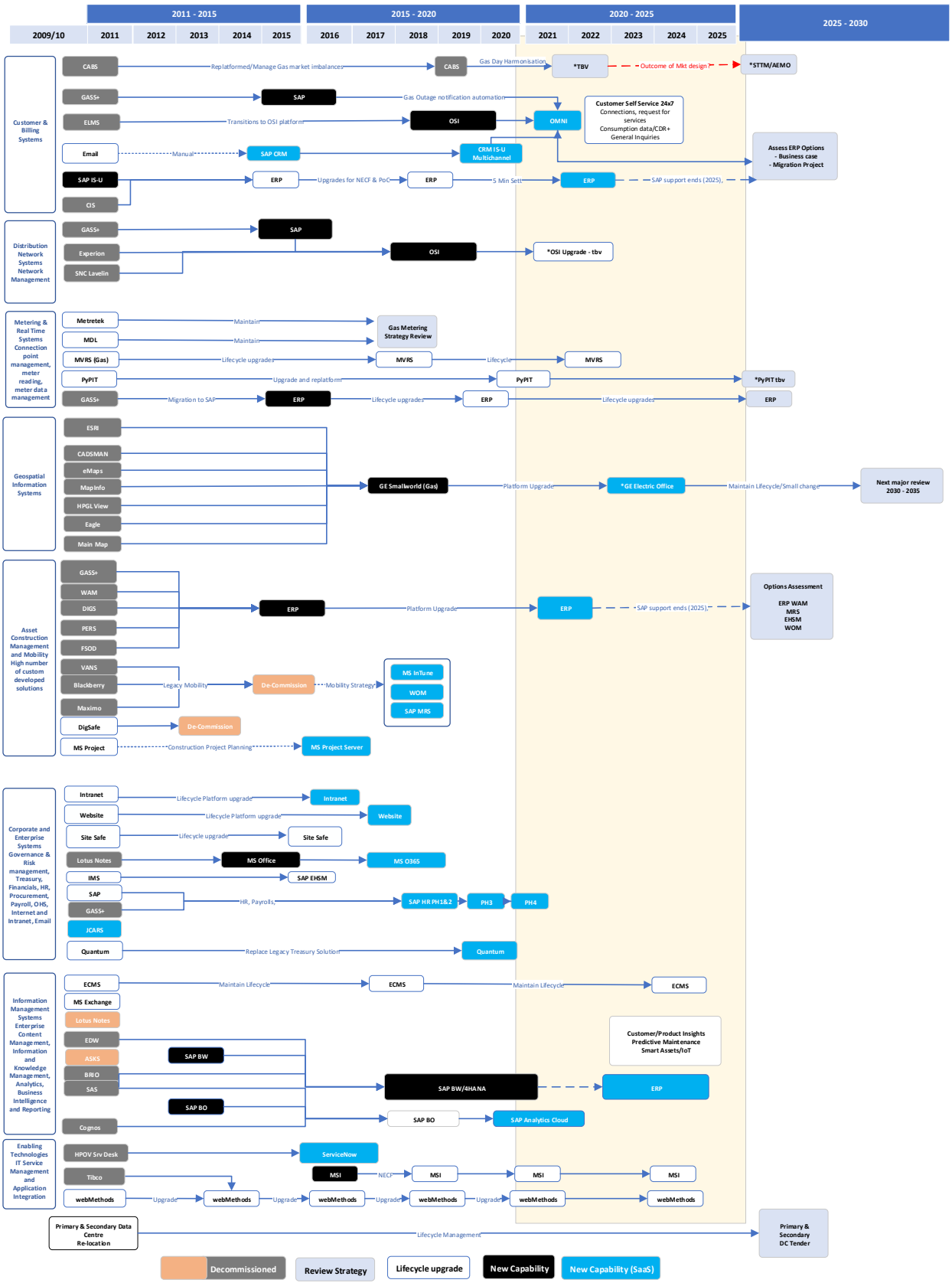
Over the term of the previous and current regulatory periods, we have replaced all of our legacy systems, resulting in a significant reduction in operational risk and improved productivity. The roadmap also reflects an increasing number of capabilities transitioning to cloud-based services where doing so is the most beneficial and cost-effective option compared to alternative solutions.

The roadmap shows the timing of new or upgraded capability being introduced due to customer demand, vendor lifecycle management, risk management planning or alignment with new regulatory obligations. Our technology roadmap is also aligned with a mature delivery capability, ensuring change management can be planned and executed based on a holistic view of the technology environment and established technology directions. This ensures that there is a prioritised view of planned replacement projects and can enable delivery synergies to be achieved and change management costs to be minimised.

Figure 4–1 provides of high-level view of both historical and forecast IT changes to our technology landscape. The consistent theme carried through from the roadmap's commencement in 2011 is to rationalise and reduce the complexity and risk of supporting the business and its customers. The black blocks represent a new capability or major change, while the royal blue signifies that a shift to a cloud-based service has occurred. The roadmap provides a quick visual awareness of the ongoing capability lifecycle for technologies, and that upgrade and replacement projects are not necessarily required in every regulatory period—the lifecycle of larger and more complex technology solutions are typically subject to transition plans which will occur across multiple regulatory periods.

Due to the level of change management involved in operating cloud-based services with security patches, software upgrades and operating system changes is that it is not practical to try and represent these on the roadmap. Cloud-based services can be subject to three, four or more upgrades per annum, and while these have a lower change impact than that of the less frequent upgrades required to non-cloud based services, the requirement to remain up to date with new releases is now a continuous process. The view captured at a roadmap level focuses more on significant upgrade or replacement programs, which can also be aligned our need to comply with new obligations such as Customer Data Rights by way of example.

Figure 4–1: 2011 – 2025+ IT roadmap



4.2 Current state application architecture

Figure 4–2: Current State Application Architecture

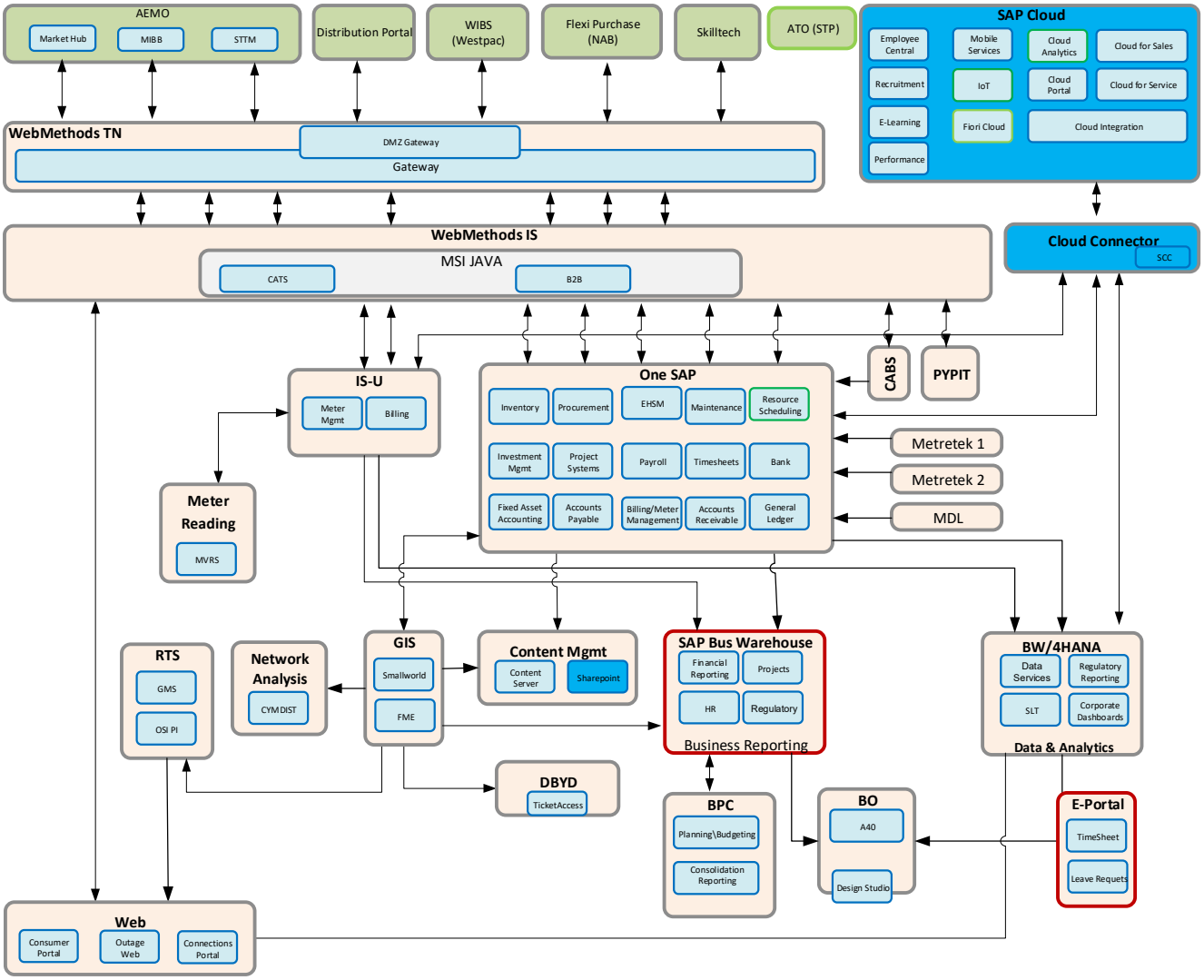


Figure 4–2 provides an overview of the application architecture currently in place at Jemena. This key architecture has matured over several years and has strength and resilience in its use of core platforms in place to support the delivery of services to customers.

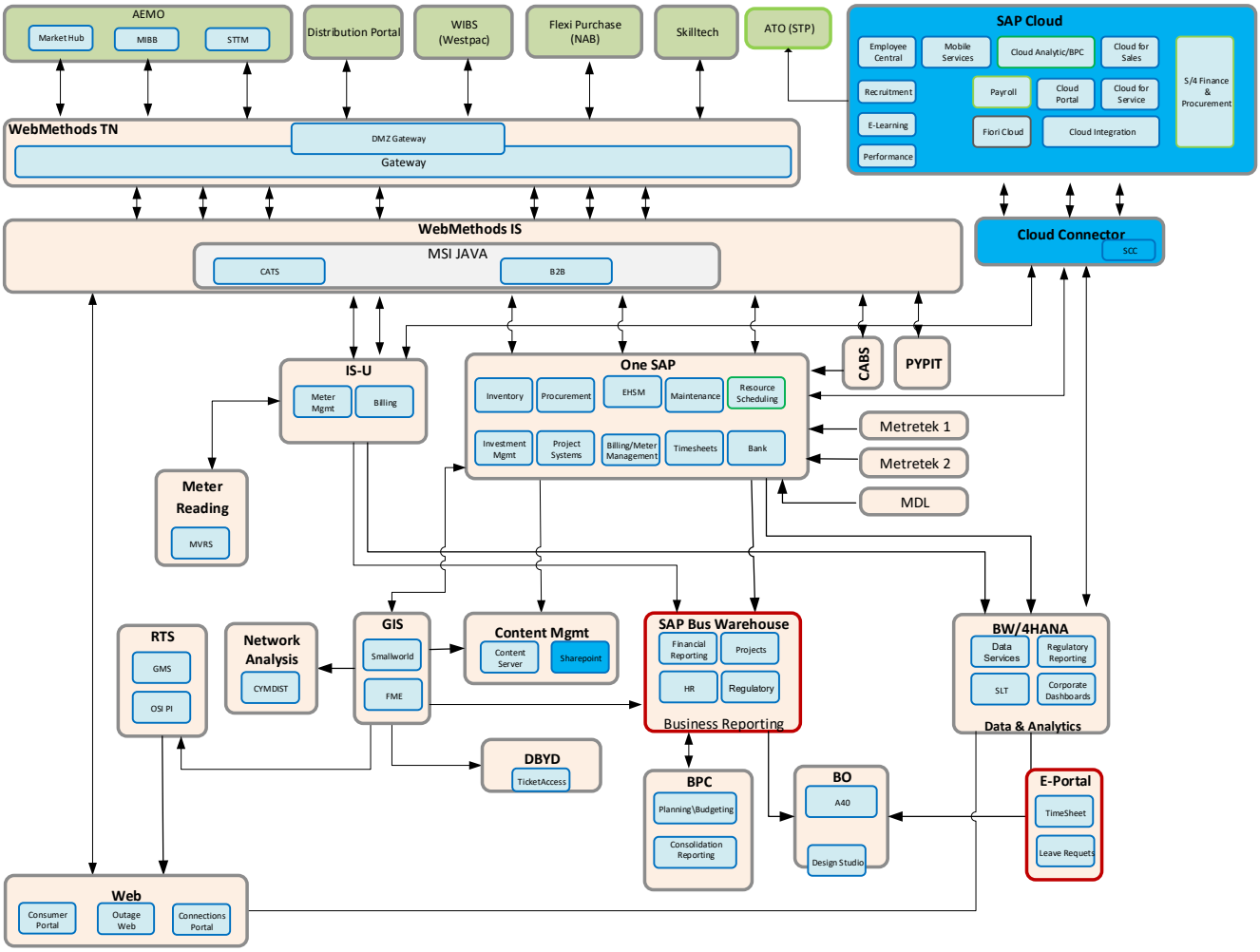
Integration services delivered by webMethods which incorporates a Trading Partner Network and DMZ gateway, Enterprise Service Bus to deliver internal integration services, these provide the bulk of integration requirements for our distribution business. The Market System Integrator application (**MSI**) provides us with business rules handling capability to deal with the many market services facilitated via the market operator. MSI allows us to avoid complex rules management changes from being pushed down into our integration and ERP solutions to manage changes to market data. This results in a lower cost of managing change when it comes to accommodating market rule changes.

Human Resources and Finance are also managed by SAP as components of the Works and Inventory Management System. Integration between SAP and the Geospatial Information System Smallworld is responsible for the geographic representation of the digital network and provides data for the Dial Before You Dig solution.

Several SAP components are used to produce Management Reporting, Service Level obligation measurement, Compliance, Asset performance and Analytics. This suite includes the SAP Business Warehouse, SAP Business Objects, together with SAP HANA providing advanced reporting and investigation capabilities. The most recent addition to the Architecture stack has been the SAP cloud platform which provides cloud integration services, plus several new capabilities providing new HR services including employee central, recruitment, cloud analytics, mobility services and cloud portal capabilities.

4.3 Target state application architecture

Figure 4–3: Target State Application Architecture



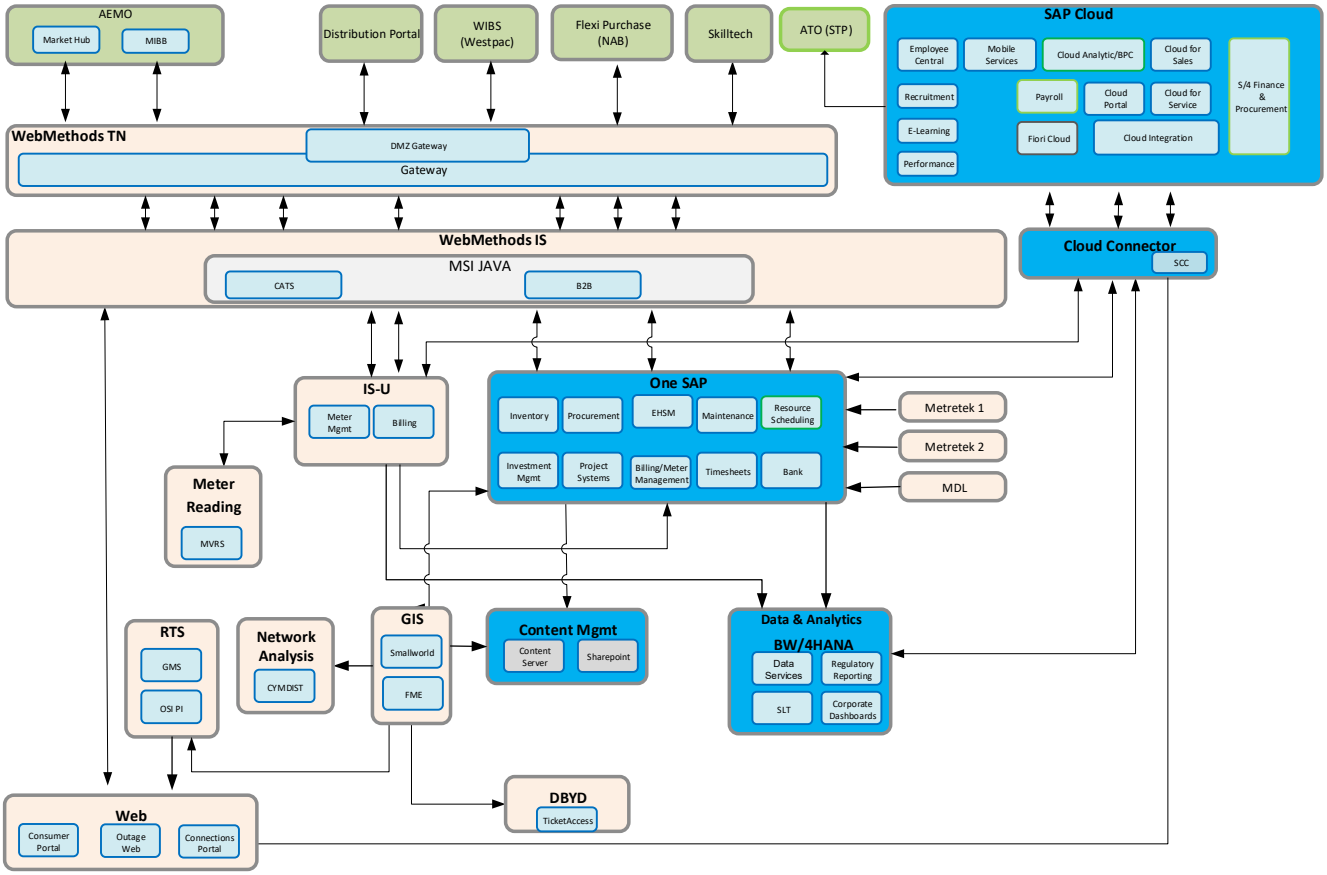
The next key steps in our technology progression of application architecture will be based on completing the first phase in the ERP upgrade, which will transition finance and procurement capability to a new cloud-based platform. Also, our Analytics and Business Warehouse will move to the cloud; this will also see the retirement of Business Objects with cloud-based solution. With these tasks completed a business case will be prepared to determine the benefits of moving all remaining services.

The target state application architecture has been developed to provide a view on how our technology landscape and ecosystems may evolve over the next decade, this a conceptual view only and is not intended at this stage to be a binding or locked in the decision. The fast and disruptive nature of new technology is a constant challenge when developing long-range predictions.

The conceptual architecture is intended to reinforce the principles of reducing the number of applications together with business process consolidation to create a more streamlined and efficient solution where customers interests are best served by the delivery of centralised services designed around the customer experience. These themes become more evident with the 2025+ future state architecture, as outlined in Figure 4–3.

4.4 Future state application architecture 2025+

Figure 4–4: Future State 2025+ Architecture



Our conceptual view beyond the next regulatory period is for the likely consolidation of the remaining **SAP IS-U** capabilities into a cloud-based service along with Enterprise Content Management. However, this will remain subject to a firmer assessment of the costs and benefits closer to the date. Under this conceptual end state, requests for data and content would become easily accessible in real time, and we would have greater flexibility in how we can deliver and best support new services to customers as they become increasingly interested in accessing data.

The customer benefits associated with increased accessibility to data and content, together with more automation of workflow means that new services can be quickly personalised and tailored to meet changing customer and market requirements in a more efficient and cost-effective way, regardless of whether the end services to customers are provided by Jemena or third parties.

The longer-term outlook and assumptions presented in relation to ERP are based on the current market offerings, ERP options are very limited at the scale and level of functionality required to support business requirements. What can't be evaluated at the time of submission preparation is whether large scale disruption will occur in this place in the market. It is expected that further evaluation will continue in the next regulatory period to test and determine if the underlying assumptions and beliefs will persist or are subject to change in strategy.

Our ability to efficiently optimise the delivery of services to customers (and the performance of our network) in the future will be heavily reliant on our IT architecture's ability to be able to quickly integrate new technologies, and interact with emerging energy market structures designed around new technologies. Under our future conceptual architecture and its converged environments, the necessary operational support resources are reduced, particularly in relation to managing ERP and analytics technologies.

5. Current period IT capex

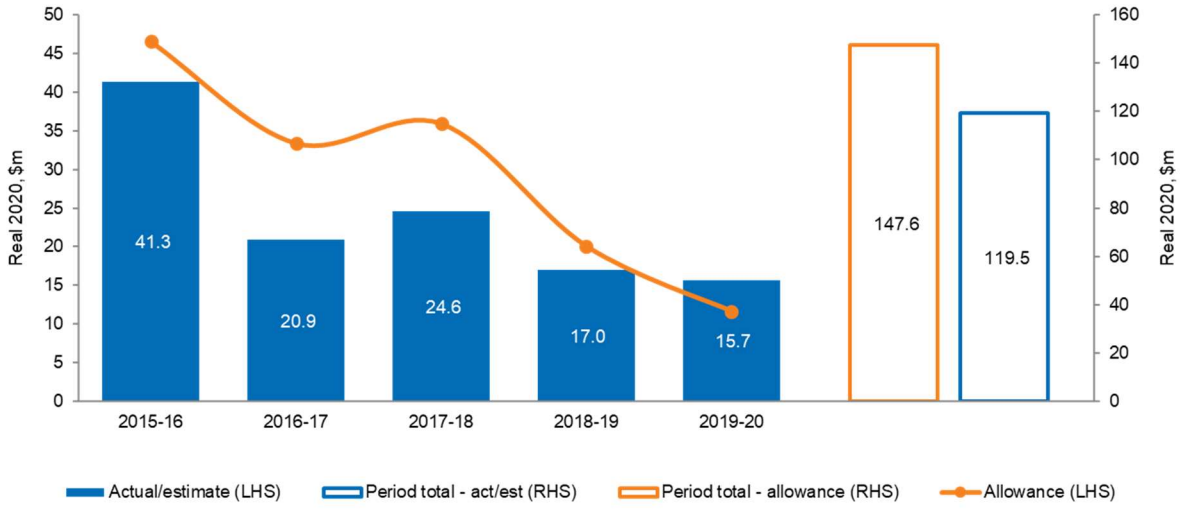
This section provides an overview of our IT capex in the current period, including against the IT capex allowance set out in the AER's Final Decision for the current AA period.

5.1 Actual and estimated IT Capex against AER allowance

We will largely deliver on our IT capex program of work commitment for the current period.

Our actual and estimated capex for the current period is $119.5m compared with the AER's allowance in its Final Decision of $147.6m, an underspend of $28.1m or 19%.

Figure 5–1: Current period capex



5.2 Major projects and programs

We are expecting to deliver most of the IT program in our forecast for the current period, see Table 5–1. A small number of IT projects will be deferred or removed based on our being able to achieve the objectives via an alternative approach. A summary level assessment has been included in Table 5–2 to demonstrate the results achieved or why we have deferred or not delivered some projects.

Table 5–1: Key capabilities delivered this period

What was planned and delivered	Why	Customer Benefits
Geospatial Information Systems	Implement a digital solution to replace the paper-based processes in use before.	The GIS is more than just a tool for automation of processes. With better quality data that can be visualised and the ready access to this data that the GIS and mobility solutions provide we have a safer work environment for our staff and a better outcome for our customers.

What was planned and delivered	Why	Customer Benefits
Field Workforce Mobility	Capability gap, no mobility solution for field workforce.	The mobility solution supports the transition from paper to digital, which reduces end-to-end process time with increased data quality.
Corporate Systems	JGN's internally developed GASS+ solution was at the end of life and needed replacement with a contemporary, commercially developed product.	This was a material non-recurrent project to replace an unsupportable and aging system. It also subsumed a substantial amount of work that would otherwise have been required if the system was in steady-state. It put JGN's corporate systems back into a supported position and enabled the continued operation of a stable, safe and secure distribution function.
SCADA and Real-Time Systems (**RTS**)	JGN needed to replace the environment with a contemporary distribution and outage management function to properly manage the stability, safety and security of the network.	Customers expect JGN to maintain service levels and provide reliability. The upgrades and replacements made in the Operational Technology area ensure that we will continue to do so.
IT Infrastructure and end-user services	Need to perform lifecycle replacement and platform augmentation. In the absence of lifecycle upgrades of equipment and tools, the additional support cost of extended support agreements increases costs.	The customer benefits are more indirect as these investments provide the environment in which the rest of our IT systems operate.
Cybersecurity	Heightened security risks and lack of incident/event management capability.	Investments in cybersecurity are intended to avoid customers ever being exposed to adverse outcomes from malicious acts or attacks instigated by others. This level of protection may never be seen or experienced by customers but remains a background service in managing customer interactions.
Technology Network Management and Capability	Automate tasks across the entire data network using a single automation script. This is not possible to achieve using decentralised, legacy network hardware and software.	Software-defined networks provide us with the ability to perform repetitious tasks quickly and efficiently, leading to lower costs to manage and better response times to change requests.
Business Reporting and Analytics	Business reporting and analytics capabilities are outdated, and rear view focused, which means customer complaints become a problem barometer.	Improved business reporting and analytics is resulting in a steady rate of improvement across all customer service metrics. Service connection times are down and still reducing, connection offers for new works are more timely and responsive, and customer satisfaction ratings are improving.

What was planned and delivered	Why	Customer Benefits
Regulatory Driven Changes	New regulatory obligations required Jemena to support: - RIN reporting, automation of data extract and reporting. - NECF. - Transition from the NSW B2B standard to National Market B2B and B2M.	Migration to national B2B standards provided the opportunity to increase Retail competition for all customers. This compliance requirement was completed as part of the GASS+ to SAP migration.

Table 5–2: Deferred or not delivered

What was planned but not delivered	What changed	Customer Impact
Metering Systems	Back-end products are ageing and falling out of support.	Meter reads continue to be a source of frustration for our customers and the support for the back-end systems exacerbates this. Addressing these issues has been deferred, and JGN is currently managing the risk. At some point, though, these risks will become unacceptably high.
Customer Systems	Customer facing systems have been lifecycled but major improvements have been deferred while core systems, data and processes have been bedded in. Key sources of data to support the customer include the corporate systems and the GIS.	Customer interactions with JGN have not materially improved, and customer access to information from billing to new connections and construction remains a source of customer frustration.

6. Next period IT objectives and outcomes, strategic themes and roadmap

This section explains the objectives, outcomes and strategic themes of our forecast IT capex.

6.1 Objectives and outcomes

This Technology Plan must deliver a balanced approach to ensure we continue to efficiently meet the rapidly evolving needs of the energy market and our customers. We have been guided by the following objectives, which align with the new capital expenditure criteria set out in the National Gas Rules (**NGR**)[6]:

- **Maintain the safety of services** – maintenance of all necessary IT systems is planned to ensure the maximum lifecycle is achieved and that the integrity and performance of the solution continue to increase resilience over the term of its lifecycle.
- **Maintain the quality, reliability and security of services** – this is necessary to ensure our business processes are designed and built in a manner that promotes the overall integrity and security of our gas distribution services.
- **Comply with regulatory obligations** – we must conform to new or changed legislation and regulations and must have plans in place to remain compliant at all times.
- **Plan for the future** – we must ensure our IT solutions are capable of supporting growth and that they include some level of flexibility to support changes to business requirements without the need for replacement or major rework of technology solutions. Our designs are based on the adoption of open standards, and cloud-based services where it is evaluated and assessed to be the most appropriate solution.

In line with these objectives, our IT capex forecast has been developed to achieve the following outcomes:

- Reliable infrastructure, systems and environments that are up-to-date, secure, efficient and fit for purpose, supporting us to maintain our current levels of service reliability for customers.
- Provision for growth and continuous change as the regulatory and business environment change.
- Operational improvement opportunities and business process efficiencies.
- Better centricity of information to support data quality and information security.
- Advanced analytical capabilities to support expedited decision making processes in a rapidly changing energy market.

6.2 Strategies

We have considered how best to achieve these objectives, having regard for the technology context discussed in section 2, how we manage and deliver IT discussed in section 3, our IT architecture discussed in section 4 and our IT capex in the current period discussed in section 5. The strategies we have developed to achieve our objectives in the next regulatory period are set out below.

- **Respond to new or changed regulatory obligations** – the regulated Australian energy market and industry continues to change, evolve and diversify with new obligations continually being introduced to:
  - Respond to changing demands and expectations of customers.
  - Ensure the market operates as intended as energy technologies evolve.

[6] National Gas Rules, rule 79.

- Put into effect the policies of Federal and State Governments.

We must continue to respond to these obligations, and that requires us to position our IT environment to be able to react. Achieving regulatory compliance in many cases requires new or changed systems' capability. Key systems which are directly involved with our market interactions, for example, the Short Term Trading Market System (**STTM**), need to be maintained in a supportable way that allows them to be able to be modified to accommodate future market initiatives.

- **Target improvements for technology capabilities** – we carefully consider how and when we introduce new technologies and solutions, with our approach being to only adopt technologies that:
  - Have high adoption rates in Australia.
  - Have proven to be robust, reliable and efficient.
  - Are capable of delivering significant value by way of avoided cost or improved underlying operational efficiencies.
  - In the absence of any new or compelling customer enhancement (in line with customers' expectations for improved digital services), we will also look to maximise and leverage opportunities to continue to develop our existing systems in preference to the early adoption of new technologies.

  Recently implemented technologies include mobility solutions, smartphones, tablets and the provision of some IT services and data via cloud computing. JGN has also implemented a GIS in this period. This is an example of JGN adopting a mature technology platform which has proven to be beneficial in other utilities and, along with our mobility platform, has seen a wholesale paper-to-digital transformation within the business.

  When we consider investments in new technology, we also consider what synergies can be achieved from the delivery and scale perspective, and are further opportunities available to leverage existing capabilities. Our program delivery approach optimises cost and efficiency by grouping like-for-like projects together. Our ability to bundle similar deployments together provides customer benefits by reducing duplication of testing efforts, specialist resources and multiple operating environments required to conduct regression testing.

- **Provide new and extended system capability** – While the NSW economy and population continues to grow, so will our customer numbers. Therefore, we need to support the growth of our network and business in terms of:
  - Growth in metering points and customer records.
  - Increasing transaction volumes and required data capacity.
  - The introduction of new systems and technology (e.g. the new GIS and upgraded SCADA systems).

  We must continue to align our business' technology with the level of capability that reflects good industry practice by implementing and using contemporary IT systems solutions and applications.

- **Continue to become more customer-centric** – Our customers include end users of energy, retailers and various other market participants. We are continuing on our journey to become more customer focused, with this being particularly relevant to technology as an enabler. Customers expect to become more digitally connected and demand better service experiences. We need to ensure we can meet our customers evolving requirements in terms of:
  - Defined services standards, determined by regulation.
  - Customers' expectations of our services and the way they interact with us.

Our technology ecosystem is critical in enabling us to meet these customers' expectations through application integration and the delivery of a more customer-centric and near real-time digital experience.

- **Employ prudent risk management to minimise total costs over the long-term** – We must provide sustainable solutions that are:
  - Prudent and low-risk long-term investments that ensure longevity and minimise the total cost of ownership.
  - Supported by vendors.
  - Replaced, or supported in-house at a reasonable cost, where vendor support is not available.

  The sustainability of systems diminishes over time as technologies go out of vendor support, no longer provide the functionality required or are no longer economic to operate compared to alternatives. We must provide for all systems and technologies to be manageable at low risk or be replaced, including by:

  - Managing risk and minimising cost increases by conducting a prioritised system upgrade and replacement program to maintain currency and support arrangements.
  - Evaluating alternative scenarios and options for cost savings associated with maintenance and support agreements.
  - Assessing potential investments using a total cost of ownership viewpoint to ensure a balance is achieved between any short term cost savings versus the long term cost of ownership.
- **Continue to rationalise and consolidate systems** – We continually monitor opportunities to improve our content and information management, such as by introducing further workflow automation to achieve higher operational efficiency and improve data quality. This approach seeks to leverage rather than replace current solutions and be more cost effective in how we support the delivery of services to customers. However, there is always a point in time when it is no longer prudent and efficient to continue to do this. From a holistic perspective, the consolidation of overlapping capability means that rationalisation of systems means less complexity and maintenance costs, resulting in a lower cost of technology overall.

  Technologies based on digital platforms offering flexibility in the adoption of emerging technology are considered to be highly desirable and will be measured against technology churn and avoidance of accumulation of technology debt.

  When determining how to best right size our technology stack, another metric used is to determine are we fit for purpose rather than following a best of breed technology approach. While there can be advantages in utilising big-name technology providers, these large solutions are not always necessary to deliver the targeted business outcome, so our measure or benchmark becomes does the solution meet the business requirements rather than target the best technology solution.

6.2.1 Cybersecurity strategy

It is essential that we continue to maintain and augment our defensive capabilities and keep fit in the war against cybersecurity threats. We plan to continue with the adoption of the Australian Signals Directorate (**ASD**) Essential 8 recommendations in addition to elements of the cybersecurity standards developed by the US National Institute of Standards and Technology (**NIST**) Cybersecurity Framework.

6.2.1.1 Industry Cybersecurity Maturity Assessment

In response to the increased risk related to cybersecurity, the Australian Energy Sector Cyber Security framework (**AESCSF**) was established. The AESCSF adopts Cybersecurity Maturity Model ES-C2M2 and the **NIST**

cybersecurity frameworks. An objective of the AESCSF coming into effect in 2018 was to assess the cyber maturity of all energy market participants to understand where there are vulnerabilities.

Jemena measured favourably in regards to its peers (ranking 6th out of 68). It was acknowledged that cybersecurity is a common challenge for the Industry and that all participants were on a journey. The assessment also identified areas of strength and areas of opportunity for Jemena's cybersecurity across the assessed domains. These opportunities have been taken into account in the development of cybersecurity investment planning in the next regulatory period.

It is important to note that the rapid advancement of cyber threats means that cybersecurity responses must also move very quickly to remain ahead of the many threats and actors that represent risks on a global scale. Tools which leverage artificial intelligence and machine learning are now maturing and provide mechanisms to constantly detect and respond to security threats. These deep learning, AI solutions which look at raw security event data to identify and prevent threats from initiating are considered leading-edge security and threat protection.

We will continue to progressively implement elements of the ASD and NIST where these standards can be applied to deliver a stronger and more robust cyberstrategy and where the investment results in an efficient cost outcome for our business and our customers, and we will continue to monitor and evaluate new ways of managing security.

The NIST framework is currently a global standard for cybersecurity and protection of critical infrastructure. It has five core objectives, which are:

- **Identify:** Assessing the threats and risks to systems and understand the vulnerabilities.
- **Protect:** Defending systems from attack with best practice approaches.
- **Detect:** Having tools and protocols in place to spot when a breach has happened.
- **Respond:** Reacting quickly using automated safeguards to contain the breach and have protocols in place to mobilise resources.
- **Recover:** Having plans in place to handle the aftermath, communicate the outcomes and review the learnings.

Our independent technology advice and research provider group Gartner uses this same model to classify products and services under a "Identify, Protect, Detect and Respond" framework when assessing the market for their cybersecurity product comparisons.

We have assessed our current cybersecurity risks based on the ASD and NIST frameworks because they are recognised as providing measurable baselines to identify existing areas of network vulnerability as well as opportunities for improvement.

Our proposed investments in cybersecurity have been based on expert guidance from Gartner, and several other security-focused organisations such as Checkpoint, Microsoft, McAfee, Huntsman and Symantec, to determine what combination of products and services provide the best and most efficient protection.

We have assessed our proposed cybersecurity investments against the vulnerabilities in our network today. The JGN Cybersecurity Enhancement Investment Brief demonstrates how we will invest in cybersecurity harden our environment and efficiently manage risks.

6.3 Capex-opex trade-offs for Cloud

The evolution of cloud services has introduced many advantages and new levels of flexibility for organisations such as ours, including:

- Capacity and scalability on demand, providing the flexibility to scale up and scale back as required. This means capacity and scale can be matched to actual business requirements at any time, minimising underutilised capacity sitting idle.
- Reduction in hardware capital investment, as we are no longer required to manage endless hardware lifecycle upgrades and replacement.
- Access to technology innovation with minimal effort and capital investment, leveraging research and development, an example being the use of artificial intelligence and machine learning to manage computing environments in the cloud and data centre solutions.
- Access to cloud data analytic solutions which are unparalleled to anything on-premise solutions can hope to achieve due to the typical constraints with on-premise solutions such as cost of ownership, access to technical skills and ability to create environments to support analytics queries.

Ongoing expenditure on cloud services is opex in nature since these services are generally licensed per user and do not lend themselves to perpetual capex licensing options. It is therefore important that we carefully consider potential capex-opex trade-offs when assessing cloud solutions.

We have transitioned to some cloud services (such as for ServiceNow, Office365 and SuccessFactors) in the current period. Each of these has required capex to facilitate the transition from their on-premise equivalent, but will only require modest capex in the next regulatory period to enable new capabilities and integration testing of new versions.

The transition to cloud services also requires an extension of security functionality to ensure information remains secure regardless of hosting location. This additional level of complexity and risk is just one of many areas assessed for suitability, with others including:

- Total cost of ownership (assessing net present value).
- Business functionality.
- Exit strategy and data retrieval.
- Supportability.

To make the transition feasible, many vendors of existing on-premise solutions will endeavour to make the transition to their cloud offering opex cost neutral, but still with a (capex) project to transition to the cloud version. The debate surrounding the future strategy for cloud versus on-premise solutions is over, and now it has become purely a question of time, costs/benefits and value realisation driving the change management timetable.

6.4 IT as a driver of productivity improvement

In addition to enabling us to maintain the safety, reliability and security of the services that our customers expect, investment in new information technology can be a key driver of operational productivity growth over time. The importance of the links between capital expenditure, on IT assets in particular, and productivity growth was recently emphasised by Cambridge Economic Policy Associates[7], who stated:

[7] Attached to Jemena's submission to the AER's Draft decision paper on forecasting productivity growth for electricity distributors, https://www.aer.gov.au/system/files/Jemena%20-%20Submission%20to%20the%20AER%20Opex%20Productivity%20Growth%20Forecast%20Review%20Draft%20Decision%20Paper%20-%2021%20December%202018.pdf

> *In other words, labour productivity growth could not have been achieved without investment in technology such as ICT.*[8]

To ensure that our customers realise the benefits of productivity improvements likely to be enabled by our investments in IT assets, we have incorporated an annual rate of productivity growth of 0.74% over the next regulatory period into our opex forecast. This is higher than the 0.5% per annum opex productivity growth factor supported by the AER in its Final Decision on Forecasting productivity growth for gas distributors (March 2019), with our forecast rate of productivity growth based on industry-level analysis for gas networks undertaken by Economic Insights. Further information on our forecast opex for the next regulatory period can be found in Attachment 6.1.

[8] Cambridge Economic Policy Associates, Analysis supporting Ausgrid's, Evoenergy's and Jemena's submission to the Australian Energy Regulator's review of its approach to forecasting operating expenditure, 20 December 2018, p. 30.

7. Capex forecasting

This section sets out our capex program planning processes, methods and the tools that we have used to develop our forecast IT capex for the next regulatory period.

7.1 Planning process – a program of work development steps

This development of the Technology Plan is informed by business and technology teams, providing both short and long term objectives and articulating the vision gathered from our customers. Aligning our planning and delivery processes with customer expectations can help to ensure that the cost of services and value creation for customers becomes more transparent and better understood. Practical examples will include ease of access to customer data, improved access channels and self-service capabilities and tracking progress of service requests.

Customers are a critical input to our technology planning process. To support the development of this AA proposal, we conducted an extensive customer engagement program to ensure that the voices of our customers are heard, particularly in relation to what customers feel provides them value and how we can meet their expectations.

Our technology planning process also includes monitoring industry trends and a maturity assessment of new technologies entering the market, with independent technology advisory bodies used to support this assessment. The rigour of our technology planning process provided us with better visibility and added discipline to how we schedule the delivery of new capabilities. This is an important step towards measuring how we achieve better customer outcomes and earned value from each investment dollar.

In brief, our planning process is centred around:

- Collaboration and engagement with customers and business stakeholders to understand and capture technology requirements.
- Understanding what gaps we need to address within our current IT capabilities and asset performance to ensure that future capability will be in place when it is needed.
- Ensuring all proposed investments under our plan represent prudent and cost-efficient outcomes that are realistic, deliverable, balanced and timely.
- Synchronisation of technology planning with other business planning streams to ensure alignment with common goals and objectives.

Once these phases are complete, this Technology Plan, Investment Briefs, capability roadmaps and capex budgets are prepared and subject to a review and refinement process ahead of AA proposal finalisation.

7.2 Forecasting method

We have prepared our IT capex forecast in line with good industry practice for technology lifecycle management. When combined with our forecast operating expenditure, the capex forecasting method we have employed ensures that our assets can be sustained in good working order and remain capable of providing optimal performance over their full lifecycle. These processes are governed and managed in accordance with a combination of our IT Strategy, IT policies and application and infrastructure roadmaps.

We have developed our IT capex forecast on a bottom-up basis, with our program consisting of individual IT 'projects'. Projects within our IT capex forecast for the next regulatory period have been costed using our standardised IT Project Estimation Tool. This ensures a consistent methodology is applied to individual initiative cost estimation. The model uses the following inputs to determine an estimated efficient cost for each project, based on the costs we have incurred when undertaking similar projects historically:

- Project type
- Project size
- Project complexity
- Project duration

As explained further in section 8.2, one of the key reasons we based our individual project estimates on known historical costs was due to the potential for the inaccuracy (and in particular, of overstating forecast expenditure) inherent in detailed bottom-up approaches. In particular—with estimates being undertaken up to seven years in the future and the significant developments in technology that are likely to occur over this time frame—the error rate is likely to grow in the latter years of the regulatory period.

As part of our process in developing our IT capex forecast, we:

- Considered top-down trend analysis of our IT capex forecast compared to previous regulatory periods.
- Undertook back-cast testing of the parameters used in our cost estimation tool against the known costs of similar historical projects.
- Considered interdependencies between individual projects and assessed the deliverability of our overall forecast.

A more detailed description of our IT capex forecasting model and forecasting approach is contained in our IT Long-Term Capex Forecasting Usage and Governance Guide.

8. Forecast IT capex

This section outlines our proposed IT capex for the 2020-25 AA period.

We have classified our forecast capex which reflect the underlying drivers of our specific projects and programs. These categories are explained in Table 8–1 below.

Table 8–1: IT value driver categories

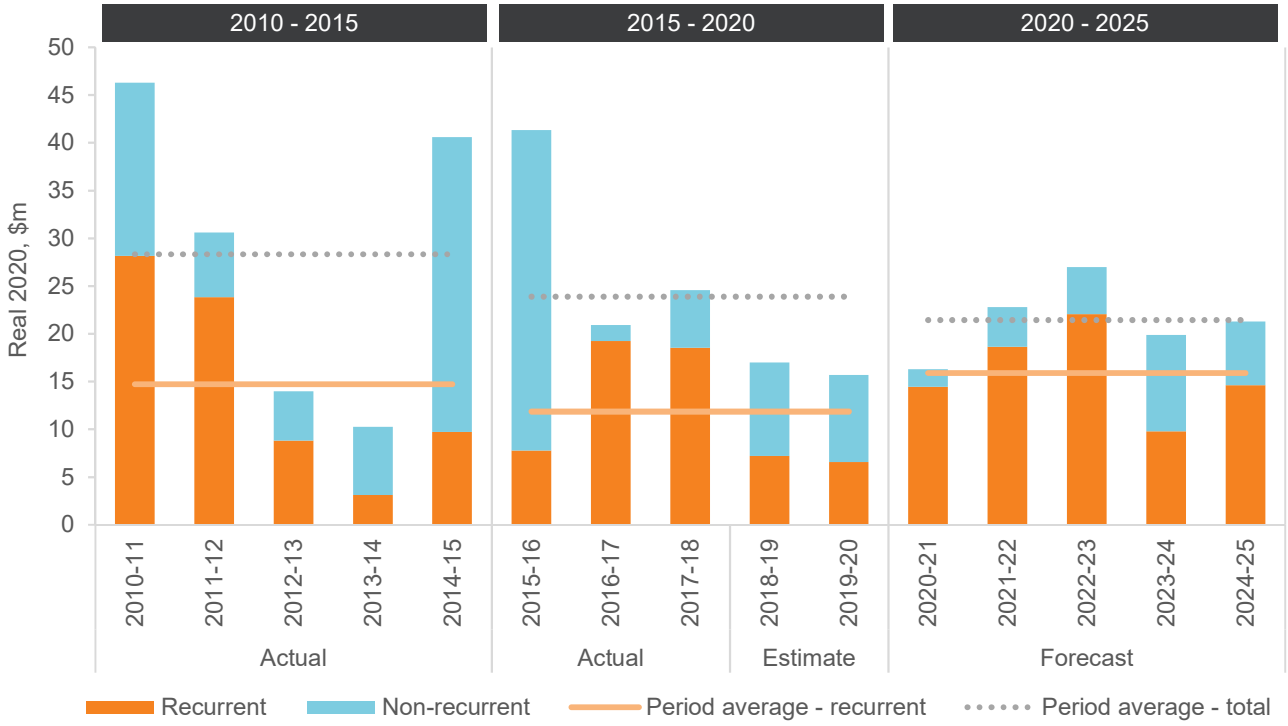
IT value driver	Description
Maintain service	The majority of our investments where we implement and maintain IT systems which underpin the basic processes of managing the gas network and performing the meter-to-market functions.
Cost-benefit	Investments which are performed to deliver additional benefit to either the business or to consumers which are not specifically regulatory requirements.
Compliance	Any activity which is specifically required to respond to regulatory requirement.
Customer	Services which improve the customer experience and which are focussed directly on the services we provide them. Many of our customer services have regulatory targets applied to them, and these targets are not always met. Technology is the enabler that will allow JGN to close these gaps.

Over the forecast period, the most significant component of our capex (94%) is targeted at maintaining the performance of our current IT assets, with 6% relating to our technology response to customer feedback about improving our customer service. We do not have any forecast capex in the next AA period in the compliance or cost-benefit categories.

Figure 8–1 illustrates the trends in our recurrent and non-recurrent IT capex over the previous, current and next regulatory periods. During the current regulatory period, we undertook a significant amount of non-recurrent expenditure, including major replacements of legacy systems, most notably transitioning from the 25-year-old, internally built GASS+ system to a modern enterprise-wide information management system which supports our billing, works management, corporate processes and reporting functions. Some of these non-recurrent replacement activities subsumed recurrent activities—as we didn't make minor incremental changes to systems we were replacing—meaning our recurrent expenditure during the 2010-15 period was diminished. For the forecast regulatory period, we expect that our recurrent expenditure will return to an efficient level of expenditure required during periods without major transformational change.

Further information about our forecast IT capex can be found in Attachment 5.1.

Figure 8–1: Recurrent and non-recurrent IT capex



8.1 Major projects and programs

Table 8–2 provides a summary of the technology areas covered by Investment Briefs requiring the capital expenditure in the next regulatory period.

Table 8–2: Summary of IT capex projects in the next regulatory period

Investment Brief Title	Explanation
Asset Management and Geospatial Information System Lifecycle Enhancement	Lifecycle and augmentation drove changes following the implementation of the Gas GIS in 2018 and improvements to the linkages and refinement of the processes relating this system to the asset and works management functions.
Corporate Systems: SAP lifecycle Reporting and Analysis Document and Content Management	Refresh and update of the corporate systems, reporting tools and document management systems as their versions reach the end of support.
ERP – SAP S4/HANA (Preparation phase)	Consisting of: - SAP ECC, core functionality migration ahead of declared end-of-support in 2025. A phased migration approach which will deal with finance, procurement, human resources and other corporate functions, leaving the asset and works management modules to be addressed in a future regulatory period. - Development of a detailed business case, solution architecture, market tender along with project planning

Investment Brief Title	Explanation
	for the subsequent period activity for the following submission.
Customer Experience	Optimisation of existing technology to create a seamless, personalised, customer-focused digital experience to enable customers to self-serve, manage their energy needs and interact with us in a manner that they choose.
Cybersecurity: Lifecycle Enhancement	The lifecycle of existing protections and enhancement of our cybersecurity capabilities to improve preventative, detective and reactive protocols to improve readiness in the event of a cyber attack.
Infrastructure: Communications Data Storage and Backups Platforms and Processing System Management Tools	Refresh and update the IT communication and networks, data and storage infrastructure, IT server equipment and System Management Tools which are approaching their end of the life cycle in the next regulatory period.
End User Services Client devices lifecycle Facilities Lifecycle Productivity tools lifecycle	Consisting of: - Refreshes of client devices in both the corporate offices as well as the field. - Upgrades to equipment in meeting rooms and dedicated conferencing facilities. - Upgrades to productivity and collaboration tools used on client devices.
Metering Lifecycle	Addressing support issues with the back-end system for all of JGN's metering data collection. Support for these solutions are all either diminishing or already discontinued.
Integration	Lifecycle refresh and update of IT integration applications (webMethods) that underpin the market interfaces that are approaching the end of their lives in the next regulatory period.
Short Term Trading Market System	Replacement of this ageing and currently unsupported system which underpins the operation of the short-term trading market in NSW and which is a market obligation for JGN.
Operational Technology	Refresh and update the newly implemented SCADA and Real-Time systems.

8.2 Project justification – investment brief introduction

We have prepared a series of Investment Briefs to accompany this Technology Plan, which is included as part of our response to the AA RIN. The section below provides details on the structure and objectives of these documents. They are intended to be easily understandable and to provide an extra level of insight into how we will meet our future state challenges through the specific projects within our forecast IT capex program.

Each Investment Brief establishes and summarises the overarching objective and problem statements that will be addressed as well as the high-level scope, what options have been considered to deliver the most prudent and efficient technology solution. The options analysis provides a preliminary assessment of the options to implement

an effective solution to achieve the objective of the Investment Brief. As part of our IT Governance process when we are considering making any investment, we undertake further options analysis using most recently available information, including a detailed costing activity and benefits assessment relating to the implementation of each option.

The Investment Briefs also describe how each project in our program of work reflects what our customers have told us through our customer engagement program and their feedback surveys.

These Investment Briefs provide summary-level information about our IT capex forecast. It is important to note that JGN does not create business cases for technology projects until the time the project reaches its final initiation step. This process is described in section 9. We consider our approach to preparing Investment Briefs rather than full business cases for projects within our capex forecast reflects a prudent and efficient approach, given:

- There are material costs associated with the production of a business case, with these costs ultimately flowing through to JGN's customers. All projects contained in our capex forecast have been scoped well in advance of the actual start date of any project given the need to develop a forecast for the next regulatory period. Technology changes are frequent, and technology roadmaps are always subject to change and provide guidance rather than facts. The significant delay between preparation of our AA proposal and the initiation of a project within the next AA period, therefore means that changes in technology and business requirements are highly likely to necessitate that the business case is re-prepared, adding additional cost to a project.
- The time horizons required by the preparation of a AA proposal forecast (up to 7 years) can be significantly longer than the 'normal' investment horizon for these types of technology assets in a business that is not subject to economic regulation using five year periods. Technology vendors can therefore be reluctant to participate in or may seek means of cost recovery for provision of responses in tender processes so far in advance of projects being initiated, or otherwise may provide non-binding or build significant risk premiums in their responses. This can make vendor responses of limited use when forecasting the efficient cost of undertaking a project in the future. In contrast, our project estimation methodology (explained in section 7.2) reflects the efficient costs we have incurred in undertaking similar projects historically.

Table 8–3 set out the details the template we have used for our Investment Briefs.

Table 8–3: Investment Brief Template

Section	Information provided
Proposed Cost	Program total cost Individual project estimates can be found in the project section.
Objective	What is the overall objective of the initiative and investment?
Problem	What is the problem/s the proposed projects address?
Customer Importance	What importance do customers place on this?
Strategic Approach	How does this support our future vision and objectives?
Options to address the problem	What options have been considered?
What are we recommending	What is our recommendation, and what makes it the choice which best contributes to the long-term interests of customers?
Dependencies	Is this related to other projects or drivers?
Scope	What do we expect to deliver through this initiative?
Projects	Which projects are related to this objective?
Cost substantiation	How did we forecast the cost?

9. Governance, sourcing and delivery

This section explains the governance framework that supports our IT capex, and how we will source and delivery our IT capex program in the next regulatory period.

9.1 IT Governance Framework

Our IT governance framework supplements our core business governance and program delivery model and defines, for IT projects (reflecting some differences like these investments compared to the other capital investments typically made by an energy network business), who has input and who is accountable for decision-making processes. Our IT governance framework is an integral part of Jemena's investment and corporate governance approaches and helps drive alignment between IT decisions and broader organisational goals and strategies. Our IT governance framework enables us to consider and implement IT decisions in a timely yet robust manner, helping to efficiently reduce the cost and risk profile of projects.

Regular monitoring and reporting under the governance framework ensures that the Board, senior executives and management have a standard and structured view of the IT programs of work, work-in-progress and the overall status on which to make decisions based on the most relevant and up to date information, including:

- Project status by stage and gate.
- Performance compared to budget and schedule.
- Benefits specification and realisation.
- Funding requirements by stage, years and months.
- Financial forecasts.
- Risks and Issues.
- Delivery performance to requirements and outcomes.
- New projects to be initiated.
- Changing business and external environments and potential impacts on projects.

9.2 Program delivery

Jemena has a proven track record in successfully and efficiently delivering its IT program of works, largely as planned, across multiple assets and regulatory periods. We have taken several considerations into account when developing our program of capital expenditure for the forecast regulatory period, and we are well-placed to efficiently deliver all required technology investments to support the delivery of the services our customers expect, due to:

- Our robust IT governance model and project delivery framework (explained further in sections 9.3 and 9.4).
- Comparable or reduced project complexity and business change impacts in the forecast regulatory period compared to previous periods of successful delivery, as we further leverage and build on our core systems.

- Our long-term planning, which considers interrelationships between projects and programs of work in the regulatory periods before and after the forecast period, such as through our multi-period ERP Strategic Roadmap.
- Our long-standing practice of calling upon external contract labour for IT project work, providing access to a large pool of resources which is 'elastic' and thereby minimising the potential for resource contention to slow down project progress.
- The diversity of project types for the coming period. By their very nature, IT projects involve key specialties, both within the IT group and also from the business. Diversity within the project mix enables the smoothing of workloads for key IT personnel and subject matter experts from the business (who participate in projects) across the enterprise and over the planning horizon.

9.3 IT Governance Model

The IT Governance model provides a framework of accountabilities, processes, and auditable and measurable controls to ensure all investment decisions are prudent, efficient and in the long-term interests of customers. For example, this model provides for integration between technology project delivery teams and key business owners to ensure that the total cost of ownership is fully assessed in our investment decision making processes.

Our objectives for the IT governance model are to:

- Provide greater clarity around IT decision rights.
- Provide IT leadership to strategic decisions and investments.
- Provide a framework to prioritise and manage IT investments.
- Ensure IT architecture enabled business requirements are authorised with supporting evidence.
- Ensure IT operations support are fit for purpose and can support critical business services in times of disaster and catastrophic events.

9.4 IT Project Delivery Governance

We individually assess each proposed project before making a final investment decision, which in some cases can result in us implementing different solutions (or different timings) to those set out in our price review forecast given the long lead time involved in preparing this. Within the regulatory period, we follow a standardised IT Project Management Lifecycle and Governance process.

Project business cases must be able to demonstrate the value of the technology investment, together with the benefits and the methodology used to quantify those benefits. This ensures projects remain prudent, efficient and in-line with customers' long-term interests.

9.4.1 Commencement of initiate and plan stage

The approval of an Investment Brief by the Jemena Leadership Team (or IT Portfolio Forum for projects less than $2 million) indicates the commencement of the Initiate and Plan stage of a project. The Investment Brief provides funding for the preparation of the business case, Project Management Plan (**PMP**) and conceptual architecture. Where necessary, the Investment Brief may also provide funding to undertake relevant procurement activities such as Request for Information or Request for Tender in line with Jemena's Procurement Policy.

9.4.2 End of initiate and plan stage

At the end of the Initiate and Plan stage of the project, the key deliverables created are the business case, PMP, benefits realisation plan and conceptual architecture. Where relevant, procurement activities performed in the Initiate and Plan stage result in vendor contracts ready for execution by Jemena upon approval of the business case.

The purpose of the business case is to present a compelling scenario to obtain relevant approvals and funding for the delivery of the remaining activities of the project, concentrating on the customer, business and financial justification for the recommended activities. The business case is presented to the Jemena Leadership Team (or business-specific committee for projects less than $2 million) and approved by members of the Jemena leadership team or business steering committee within their respective Delegated Financial Authority.

Upon approval of the business case and depending on the size of a project, a Project Steering Committee may be established. The PMP, which stipulates the stage boundaries for the project and what will be delivered and checked at the end of each stage, is presented to the Project Steering Committee for approval. The approval of the business case and PMP is the stage gate to move from Initiate and Plan into Analysis and Design.

9.4.3 End of analysis and design stage

At the end of the Analysis and Design stage of the project, the key deliverable created is the Solution Blueprint (Solution Design Summary). The Solution Blueprint is a summary of the following deliverables:

- Business Requirements
- Process Design
- Detailed Design
- Test Strategy
- Solution Performance Design
- Security Compliance Design

Towards the end of the Analysis and Design Stage of the project, the Project Manager reviews the following to provide information for the next stage (Build and Test) of the project:

- Identify any variation between planned and actual progress.
- Identify any variation in the expected future resource availability.
- Assess any current risks for the stage.
- Review external developments that may impact on the project.

The Project Manager also assesses whether the PMP and Business Case needs to be revised. This is achieved by assessing the costs, benefits, risks and schedule that may have been affected by internal or external influences. Possible reasons to update a PMP include changes in:

- Implementation dates.
- Cost of delivery or support.
- External, corporate or Program environments.
- Resources, including internal and external suppliers.

Identified changes required in the PMP are documented in a Change Request, and the PMP requires approval once updated. Where changes in the PMP impact the Business Case (e.g. costs of delivery or support, or delayed benefit realisation), a revision to the Business Case is required.

9.4.4 End of build and test stage

At the end of the Build and Test stage of the project, the key deliverables created are the Cutover Plan and the Go-Live Readiness Report. The Go-Live Readiness Report includes references to the following deliverables:

- Test Summary Report
- Cutover Plan
- IT Operations Transition Plan
- Business Transition Plan
- Go Live Readiness Report

The Project Manager reviews the plan for the next stage to ensure that the components of the PMP are still valid. This includes:

- Ensuring the major products for the Cutover and Close stage of the project are still valid.
- Checking external dependencies to ensure that there is no change to the timeframe or scope of the project.
- Adding further detail to the project schedule for the Build and Test stage and ensure that inter-project dependencies are identified.

9.4.5 End of cutover and close stage

As the project comes to a close, the Project Manager will notify the IT PMO that the project is ready for decommission and to close out. The key deliverable from the end of Cutover and Close stage is the Project Close Report. The Project Manager will complete the Project Close Report, and this is presented to the Project Steering Committee (**PSC**) for approval. Approval of the Project Close Report signifies the project moving through the final stage gate.

9.4.6 Procurement, legal and regulatory process

As part of the IT Program Management Office methodology outlined above, all IT projects also involve significant collaboration and peer review with internal teams to ensure solutions are fit for purpose. A typical engagement includes the Customer and Markets team, which will be followed by Procurement, Regulatory and compliance and Legal teams to ensure specialist guidance and support is obtained to ensure compliance with internal and external obligations.