Jemena Electricity Networks (Vic) Ltd

2016-20 Electricity Distribution Price Review Regulatory Proposal

Attachment 7-7

IT Asset Management Plan (2016-2020)

Public

30 April 2015

Jemena Electricity Networks (Vic) Ltd

IT Asset Management Plan (2016-2020)

Version 4.3.1

Public

30 April 2015

An appropriate citation for this paper is:

IT Asset Management Plan (2016-2020)
Our Ref: ELE PL 0051

This is a Controlled Document with the Master Copy maintained in the Jemena Enterprise Content Management System (ECMS).

This Master Copy is controlled by GM IT Strategy and Architecture in accordance with the approved Records Management Plan.

Electronic copies of the document are issued to the following parties:

Copy No.	Contact / Holder	Organisation
1 (Master)	General Manager IT Strategy & Architecture	Jemena IT Division
2	Chief Information Officer	Jemena IT Division
3	Executive General Manager Asset Management	Jemena Asset Management Division
4	Executive General Manager Strategy Regulation & Markets	Jemena Strategy Regulation & Markets Division

SIGNATORIES

Name	Date	Signature
Prepared by the IT Strategy & Architecture Team		
Alan Hume General Manager IT Strategy & Architecture	27/4/2015	
Endorsed by		
Cameron Dorse Chief Information Officer	27-April 2015	
Approved by		
Paul Adams Managing Director	27 APRIL 15	

TABLE OF CONTENTS

TABLE OF CONTENTS

List of tables

List of figures

List of appendices

GLOSSARY

Term	Explanation
ACS	Alternative Control Systems/Services
AEMA	Australian Energy Market Agreement
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ALM	Application Lifecycle Management
AMI	Advanced Metering Infrastructure
AMP	Asset Management Plan
B2B	Business to Business In the context of automated computer interfaces.
B2C	Business to Customer/Consumer In the context of automated computer interfaces.
B2M	Business to Market In the context of automated computer interfaces.
BAU	Business As Usual
BI	Business Intelligence
BYOD	Bring Your Own Device
CAD	Computer Aided Design
capex	Capital expenditure
CBD	Central Business District
CIS	Customer Information System
COAG	Council of Australian Governments
COLA	Cost of Living Adjustment
CPI	Consumer Price Index
CRM	Customer Relationship Management
CROIC	Cost Recovery Order in Council
CY	Calendar Year
DFA	Delegated Financial Authority
DMS	Distribution Management System
DNSP	Distribution Network Service Provider
DUoS	Distribution Use of System
DW	Data Warehouse
B Services	Enterprise Business Services A subsidiary company providing IT services which were transitioned back in-house in 2014.

Term	Explanation
ECMS	Enterprise Content Management System
EDPR	Electricity Distribution Price Review
ERP	Enterprise Resource Planning Fully integrated suite of applications for finance, HR, asset management etc.
ESC	Essential Services Commission
FLISR	Fault Location, Isolation & Supply Restoration
FY	Financial Year
GIS	Geospatial/Geophysical Information System
HR	Human Resources
IaaS	Infrastructure as a Service Cloud based service delivery at the hardware layer.
ICT	Information and Communications Technology
ILM	Information Lifecycle Management
IP	Intellectual Property
ISDN	Integrated Services Digital Network
IT	Information Technology
IVR	Interactive Voice Response A system to handle incoming and outgoing calls automatically.
IMS	Incident Management System
JEN	Jemena Electricity Networks (Vic)
JIT	Jemena Information Technology The group which manages Jemena's applications.
JLT	Jemena Leadership Team
JGN	Jemena Gas Networks (NSW)
JSAP	Jemena's SAP implementation
KPI	Key Performance Indicator
LIDAR	Light Detection and Ranging An analog for RADAR utilising light waves.
MDMs	Meter Data Management System
MDM	Mobility Device Management
MOE	Managed Operating Environment i.e. the desktop environment and suite of tools installed on Jemena's personal computer fleet.
MS Excel	Microsoft Excel
MS Word	Microsoft Word
NBN	National Broadband Network
NECF	National Energy Customer Framework

GLOSSARY

Term	Explanation
NEL	National Electricity Law
NMI	National Meter Identifier
NMS	Network Management System
OHS	Occupational Health and Safety
OMS	Outage Management System
OneSAP	Jemena's consolidated SAP environment
opex	Operating expenditure
OS	Operating System
OT	Operational Technology
PaaS	Platform as a Service Cloud based service delivery at the Operating System (OS) and database layer.
PABX	Private Automatic Branch eXchange Telephone switching equipment for internal use within organisations.
PDM	Project Delivery Methodology
PMO	Program Management Office
PMP	Project Management Plan
PoC	Power of Choice
PPM	Portfolio and Project Management Also an SAP module.
PSC	Project Steering Committee
RAB	Regulated Asset Base
RIN	Regulatory Information Notice
RFI	Request For Information
RFT	Request For Tender
RTS	Real Time Systems
SaaS	Software as a Service Cloud based service delivery at the application layer.
SAN	Storage Area Network A storage option that provides managed data storage to multiple devices.
SCADA	Supervisory Control And Data Acquisition
SCS	Standard Control Systems/Services
SGSPAA	State Grid/Singapore Power (Australia) Assets
SIEM	Security Information and Event Management
SLA	Service Level Agreement
SME	Subject Matter Expert
SOE	Standard Operating Environment

Term	Explanation
	i.e. the desktop environment and suite of tools installed on Jemena's personal computer fleet.
T2020	Towards 2020 A Jemena program preparing the business
TCO	Total Cost of Ownership
totex	Total expenditure The sum of capex and opex.
TRM	Technical Reference Model
VOIP	Voice Over Internet Protocol A means of conducting voice calls over data networks.
WACC	Weighted Average Cost of Capital
WBS	Work Breakdown Structure

APPLICATIONS SYSTEM GLOSSARY

Application Name	Vendor or Brand	Application Description
ACL Audit Server	Jemena in-house developed	Application that takes extracts of SAP data for analysis by internal audit.
ARIS	Software AG	Architecture of Integrated Information Systems A business process modelling and systems architecture tool.
ASKS	Jemena in-house developed	GASS+ Key Performance Indicators and ad hoc queries for: • Jemena Gas Network NSW • ActewAGL Gas Network ACT
Audit Records Management System	Jemena in-house developed	
BRIO	Oracle (formerly Hyperion)	A reporting tool.
CADDSMAN Modeller	CADDSMAN Pty Ltd	Computer Aided Drafting (CAD) Package. Used to maintain record of asset location (gas mains & facilities) for Jemena Gas Network (ActewAGL).
ChemAlert	ChemAlert	Chemical Management to meet OH&S regulations.
CABS-ELMS	Jemena in-house developed In partnership with Dius Computing	The systems consists of 2 components to: Manage the contracts and produce data and billing for large businesses and users of gas including non-standard agreements. Manage the gas demand and load including emergency shedding of gas load.
Cognos	IBM	A reporting tool.

Application Name	Vendor or Brand	Application Description
DigSafe Pro	PelicanCorp	Provides Jemena's Dial Before You Dig functionality.
Drawbridge	BTM Software	Drawings tool used by Jemena for distribution network assets drawings.
Control M	IBM	Job Scheduling Tool - schedules most of CISPlus jobs.
Control SA	IBM	Account Provisioning workflow.
Crossing Notification System	Jemena in-house developed	Manages crossing data for gas assets.
Emergency Load Management System	Jemena in-house developed with external services provider Dius Computing	Gas network outage management tool for load shedding.
ERDAS ER Mapper	Intergraph	Package add-on for GeoPlus to manage extensive aerial photography data in ECW format.
ESRI (Suite of Applications and Tools)	ESRI	A Geospatial Information System currently used by JGN for geospatial management of the interface between the distribution network and the transmission pipes.
ESRI - FlexLM License Manager	ESRI	ESRI FlexLM ESRI FlexLM licence manager for GeoPlus GIS system ESRIv9.2.
ESRI ArcGIS Desktop	ESRI	GIS system for managing gas pipelines assets.
ESRI ArcReader	ESRI	The Field GIS is a lightweight GIS viewer (ESRI ArcReader application), with an intermediate level of mapping, markup and data querying capabilities. The Field GIS is aimed at users who require OFFLINE access to gas Transmission GIS data.
ESRI WebGIS	ESRI	The WebGIS is an on-line GIS viewer designed to offer a single interface to the GIS data and related databases.
ET Web	ET Web Solutions	A performance management tool.
GASS+ (Includes ASAP, ASIO, DIGS, GASS, GASSPLAY, GOLD, NETWPLAY, RUGS & VANS)	Jemena in-house developed	Gas Administration and Service System for: Jemena Gas Network ActewAGL Gas Network
GASS Suite Modules ASAP ASIO DIGS GASSPlay & RUGS GOLD NETWPLAY VANS	Jemena in-house developed	Handles: Inventory management. GASS Suite security management and access. Manages requests for gas service. Information analysis and reporting. Systems to manage the rehabilitation of gas pipes. Distribution network modeling.

Application Name	Vendor or Brand	Application Description
		Management and tracking of non-inventory vehicles.
GENe	GE Digital Energy	A Supervisory Control & Data Acquisition (SCADA) system.
GeoPlus Portal	GEO-Plus	Web Portal application for managing gas assets.
HP Quality Centre	Hewlett Packard	Systems Testing Tool.
HPGL View	Hewlett Packard	Application to view & print native CADDSMAN files of NSW mains maps (being replaced by Mains Maps).
JCARS	Standards Australia	Jemena Compliance and Risk Management System for tracking risks.
Jemena Intranet	Jemena in-house developed	Portal to services and applications including: • Web apps • IT Shop • Phone list • Self-service portal

OVERVIEW

INTRODUCTION

The purpose of this document is to define the Information Technology Asset Management Plan (IT AMP) for the Jemena Electricity Network (JEN). The IT AMP primarily focuses on the 2016 – 2020 regulatory submission period, but also includes a 20-year financial forecast to 2035. JEN provides electricity distribution services to more than 310,000 customers in a geographic region covering over 950 square kilometres of north-west greater Melbourne. The IT AMP provides a summary of the proposed capital program of work that will be undertaken to service customers across the Jemena Electricity Network.

BUSINESS STRATEGY AND IT ALIGNMENT

The IT AMP forms part of the Jemena's overall business strategy and provides a direct line of sight to the IT solutions and enabling technologies that support the business, this is achieved by:

- Alignment and delivery of IT capabilities that enable business plans.
- Provision of technology platforms that support future growth in the energy market.
- Ensuring operations are sustainable and risk levels are appropriately managed.
- Provision of cost effective and fit for purpose technologies that benefit JEN customers.

The IT AMP provides an overview of the program of work, operations and lifecycle management of information systems covering the completion of the EDPR 2011 and the EDPR 2016 period.

The strategic drivers and principles used to guide the preparation of the IT Asset Management Plan are consistent with:

- Operating as a portfolio model of separate, integrated businesses, leveraging scale and enterprise capabilities.
- Ensuring logical data separation whilst leveraging enterprise investments.
- Seeking to adopt industry best practices available through package software offerings to deliver business requirements.
- Simplifying and standardising processes and technology.
- Creating agility and flexibility to scale up and scale down to suit contractual requirements and support business strategy.
- Implementing an architecture based on an appropriately balanced mix of fixed and variable cost infrastructure.
- Operating efficiently, being customer focussed and commercially strong.
- Measuring investments by Total Cost of Ownership (TCO).
- Basing investment decisions on business strategies and leveraging the investment and opportunities made possible from Advanced Metering Infrastructure (AMI) to improve the quality and security of supply across the network.
- Increasing integration between the core SAP ERP, network operations and geospatial platforms to deliver process centric services and superior customer outcomes.

- Developing services to empower the consumer to make informed choices in how they manage energy consumption through provision of self-service facilities to view energy usage.
- Provision of incremental capacity to accommodate natural growth across the network, due to urban expansion and increased customer connections.
- Hardening of cyber security and a multi layered IT defence approach to the heightened security risks and the potential for malicious threats to be carried out on the distribution network.
- Increased risk prevention and countermeasures to support SCADA operations from exposure to acts of terrorism targeting damage or disablement of the energy distribution network.
- Maintaining an appropriate IT asset lifecycle program to ensure continuous vendor support is available and ensure prolonged usage of legacy systems is possible until they reach technical obsolescence.
- Extending capabilities to align with customer expectations of an Australian energy distribution business including increased access to data, information and emergency management scenarios.
- Establishing new capabilities to drive better planning and become more operationally efficient through the introduction of a field mobility solution, Project and Program Management solutions, and establishing a new Customer Relationship Management system to facilitate increased engagement with customers.
- Positive reaffirmation and inclusion of the Distribution Management System project which was deferred in the 2011 EDPR program of work due to prudent re-prioritisation.

CAPITAL PROGRAM CATEGORIES

JEN's system and process capability is delivered via a range of Information Technologies and business solutions. This blend of solutions supports the unique electricity requirements and also seeks to leverage enterprise capabilities of Jemena where appropriate. The solutions can be broadly categorised into four sets of core IT capability and services provided to JEN, which are:

- Business Process Automation – to make provision of services to the electricity market efficient, reliable and cost effective.
- Information and Records Provision – provide and maintain all information required to plan, develop and operate the business effectively and comply with energy and Government regulation.
- Connecting with Customers – to service the needs of market participants including retailers and end consumers through IT supported interaction and information provided through multiple channels.
- Productivity Tools – the provision of technology tools for the use of our workforce, partners and market participants to efficiently operate the energy services in a timely and cost effective manner.

The provision of IT services to support JEN is based on a shared services model with funding and resourcing of services split across the Jemena Group of companies. Jemena shares the following technologies and services across the group:

- All corporate applications systems providing functionality for:
  - Executive management information, decision support and reporting.
  - Finance and accounting.
  - Office systems.
    - Program and project management.
- All IT infrastructure.

- Maintenance and support is managed and controlled centrally under the IT Operations division with the support of vendors and partners.

Jemena has common solutions but in some cases, delivered via separate instances of configured IT solutions for electricity, gas distribution and transmission gas. Jemena's target IT architecture includes the following products and solutions:

- SAP for asset management.
- SAP for customer management.
- SAP for mass market network billing.
- Bespoke applications for market interfaces with customers and retailers, and for billing large consumers.
- Real Time Systems and SCADA with various technologies.
- Mobility technologies.
- SAP for human resources.
- SAP business intelligence for reporting and analytics.

Where a solution is exclusively used by the electricity business all costs are fully allocated to JEN. The IT Assets and investment projects are categorised and described according to the following energy market services and business purpose:

1. Regulatory and Market Services.
2. Corporate and Office Systems.
3. Finance & Accounting.
4. Human Resources, Safety & Incident Management.
5. SAP Lifecycle Management.
6. Customer Systems.
7. Outage Management (OMS) + Distribution Management (DMS) + Emergency Management.
8. Business Intelligence, Reporting & Data Warehouse Systems.
9. Document, Records & Content Management Systems.
10. Geospatial Systems & Mapping & Asset Imaging.
11. Asset Construction & Field Services Systems.
12. IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement).
13. Metering - Standard Control Systems Metering.
14. Metering - Ongoing Advanced Metering for Contestability.

EDPR ASSET MANAGEMENT PROGRAM DELIVERY STATUS

From the commencement of the EDPR 2011 period JEN has undertaken and completed the following major projects:

1. Replaced the 12 year old legacy SAP system which supported enterprise management capabilities across Asset Management and Financial services.
2. Developed and commissioned the AMI advanced meter systems based on SAP IS-U/Itron and the Silver Spring Network Management System (NMS).
3. Progressed process simplification initiatives for field processes and procured hardware to support selected field activities.
4. Complied with the extensive range of market and regulatory change obligations.
5. Upgraded SCADA and introduced real time configuration to the SCADA environment.
6. Relocated from the Primary and Secondary legacy Data Centres that had reached end of life as they could no longer expand. The multi stage transition was completed in 2012/13 into 2 fully outsourced data centres and also included facilities management service contracts.
7. Replaced the core IT Infrastructure including a back log of end of life systems with new technologies to be more efficient and more cost effective.
8. Replaced the desktop and laptop standard operating environments, including an upgrade of the Microsoft Office business suite.
9. Conducted a number of system consolidations, replacements and retirements.
10. Implemented the first cloud based technologies and cloud based Software as a Service.

The following major projects to be completed by the end of 2015 remain consistent with the EDPR 2011 asset management plan submission and determination:

- The Jemena JSAP Operations Alignment and foundation for RIN reporting data will be completed in 2015.
- SiteSafe Incident management system upgrade.
- Records and document management development to support obligations alignment.
- Network visualisation capabilities to view and manage network assets.
- Development of the Field Mobility strategy and blueprint to support the mobility business case.
- Enhanced channels for customer engagement with the development of the network distribution portal, updates to call centre and IVR technologies plus the inclusion of web based solutions to support customer service.
- Retirement of legacy meters remaining from the rollout of AMI meters including:
  - Interval Metering Types 1-4
  - Metrology Type 5 & 6
  - Type 7 Unmetered Supplies
  - Public Lighting
- Retirement of the legacy CIS+ system used to support connection point management and network data management.
- Lifecycle growth and replacement projects for IT Infrastructure will take place for:
  - Data storage.

- Infrastructure services.
- Platforms and processing.
- End user services.
- Organic growth as the market and business grows.

EDPR 2016 PERIOD PROGRAM OF WORK AND IT CAPEX

The EDPR program of work plans to invest capex, refer Table 1 – IT Capital Expenditure by Category below, in information systems and technologies. This includes [c-i-c] of investments deferred from the previous EDPR 2011 period due to the unplanned introduction of systems to support the National Energy Customer Framework and new tariff pricing structures.

The key principles for determining the capital expenditure are that the investments must be prudent, provide for efficient energy services to the market and be cost effective.

All dollar values represented in this AMP are 2014 real costs.

The strategic initiatives that are reflected in the program of work are:

- Extensions to the Geospatial Information System (GIS) and SCADA system.
- Meter contestability for AMI meters from 2016.
- Develop CRM capabilities for managing and recording interactions with customers.
- Provision of capability to support AMI meter contestability.
- Upgrading the SAP IS-U/Itron and NMS for AMI metering.
- Outage management replacement including AMI alerts and switching instructions, Fault Location, Isolation & Supply Restoration (FLISR) plus integration with IVR and social media publishing.
- Distribution management replacement including integration with Power Quality Management and provision for energy supply contingency analysis and embedded generation control and management.
- Leverage prior investment in business intelligence technologies.
- Establishment of a new data warehouse to manage the increased growth and expansion of data required for reporting and analytical purposes.
- Produce a new distribution network data model for design purposes and decision support.
- Establish platforms to support field mobility capability.
- Ongoing consolidation of systems to simplify systems provisioning, vendor management and drive further efficiency into business processes.
- Provision of solutions that are flexible and can be extended to support growth fluctuations in the customer space driven by changes in customer demographics, new connections and the scale of the distribution network.
- To provide for the extension of systems, remediation of systems and continuous change in the business environment as the energy market constantly changes.
- Ensure the sustainability of existing systems and infrastructure by managing lifecycle upgrades and replacement programs based on good industry practice.

- Planned migration to more efficient and cost effective solutions following the end of each current asset's life.

IT capital expenditure by category is summarised in Table 1 – IT Capital Expenditure by Category below.

Table 1 – IT Capital Expenditure by Category

JEN EDPR IT Capex Plan	Direct Escalated Costs					
Summary By Category	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
Category: Regulatory & Market Services Systems	$994,120	$440,230	$446,638	$453,793	$462,004	**$2,796,784**
Category: Corporate & Office Systems	$1,015,832	$183,903	$474,886	$2,863,605	$192,864	**$4,731,091**
Category: Finance & Accounting	$689,683	$374,373	$144,173	$146,399	$248,320	**$1,602,949**
Category: Human Resources, Safety & Incident Management	$1,307,455	$631,854	$272,327	$276,532	$281,430	**$2,769,598**
Category: SAP Lifecycle Management	$1,280,058	$392,154	$1,171,267	$658,752	$756,931	**$4,259,162**
Category: Customer Systems	$2,790,362	$1,185,384	$58,618	$839,950	$160,065	**$5,034,379**
Category: Outage Management (OMS) + Distribution Management (DMS) + Emergency Management	$1,677,482	$4,638,211	$6,204,782	$1,065,400	$1,000,193	**$14,586,068**
Category: Business Intelligence, Reporting & Data Warehouse Systems	$228,722	$232,136	$2,453,392	$2,491,309	$863,436	**$6,268,996**
Category: Document, Records & Content Management Systems	$1,275,563	$920,572	$611,595	$1,325,935	$923,800	**$5,057,466**
Category: Geospatial Systems & Mapping & Asset Imaging	$933,011	$2,059,806	$611,241	$2,020,088	$3,448,676	**$9,072,823**
Category: Asset Construction & Field Services Systems	$3,351,879	$3,901,206	$1,322,071	$626,060	$1,166,876	**$10,368,091**
Category: IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement)	$5,486,978	$7,212,198	$8,011,936	$3,301,856	$2,942,948	**$26,955,915**
Category: Metering - Standard Control Systems Metering	$321,842	$799,038	$328,886	$2,205,594	$4,221,204	**$7,876,564**
Category: Metering - Ongoing Advanced Metering for Contestability	$7,368	$7,279	$167,276	$169,668	$2,078,303	**$2,429,893**
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**

Table 2 – Escalation Cost Factors

CPI indexes (real to nominal)	CY14	CY15	CY16	CY17	CY18	CY19	CY20
Real 2014	1.0000	1.0231	1.0494	1.0763	1.1040	1.1324	1.1615

The major projects and investments summary listed below represent 59% of all capital expenditure over the next EDPR period. The remaining 41% represents growth, system upgrades as well as extensions, remediation investments and a forecast of the funding supporting regulatory and business environment changes. The major projects represent a mix of replacement projects and the introduction of new capability for JEN. The purpose of establishing new system capabilities in JEN is to deliver services and efficiencies in accordance with current benchmarks set by Australian distribution energy businesses and to align JEN with good industry practice in IT management. The proposed changes reflect customer and market expectations for measurement of good industry practice and efficiencies expected of contemporary energy services organisations.

The major projects are as listed in Table 3 – Project Investment Summary below:

Table 3 – Project Investment Summary

Project	Investment Description
1. Desktop/Laptop Standard Operating Environment Replacement	The lifecycle replacement of the devices and standard operating environment at the end of their economic life, for security risk mitigation, at the end of technical life and due to obsolescence.
2. Customer Relationship	New capability and extend the current customer management services.

Project	Investment Description
Management	
3. Outage Management and Distribution Management	The upgrade and/or replacement of the current Outage Management System as it reaches end of life. The addition of Distribution Management capability. Capability for outage and phase identification from smart devices on the network.
4. Business Analytics	Replace end of life business intelligence technologies, extend capability and leverage the AMI data to improve the energy distribution services through analytics and decision support information.
5. Data Warehouse Replacement Project	Replace and extend the current AMI Data Warehouse to all of JEN.
6. Document and Records Management	Archiving and decommissioning of obsolete data and tools.
7. Geospatial Information Systems	Improved capability and safety measures with the addition of new tools and consolidation information through integration with systems sources for asset and image data.
8. Corporate and Field Mobility	New capability that provides devices, network communications and integration to IT systems to support provision of services to customers.
9. Standard Control Systems (SCS) metering – Network Management System Upgrade	This project is a system lifecycle upgrade for a large complex system.
10. AMI Metering contestability	New capability to meet new AER regulations and market services to make AMI meters contestable.
11. Contestable Metering – Network Management System Upgrade (Shared system with SCS Metering above.	This project is a system lifecycle upgrade for a system shared with SCS Metering. NB: costs for the contestable metering project will be the subject of a pass-through exercise.
12. IT Infrastructure - Asset Lifecycle Projects	Sustain the current capability largely with replacement and some upgrades.
13. Data Storage - SAN Replacement	Systems replacement at end of life. Part of the IT Infrastructure plan
14. Provision for Growth	To meet market and business growth for software licenses and capacity growth.
15. Provision to Extend, Remediate and Change	Meet demand and plans for greater usage of existing IT systems Improve existing services to be more efficient Remediate systems to ensure sustainable performance standards Respond to continuous external changes made necessary by the market

Project	Investment Description
	and business environment.

The major projects and investments by capex value are summarised in Table 4 – IT Capital Expenditure by Major Investments.

Table 4 – IT Capital Expenditure by Major Investments

Major Projects		Direct Escalated Costs					
Project ID	Project Name	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
28	Desktop Tools Lifecycle Management - Replacement	[c-i-c]					
82	SAP Lifecycle Management - Technical Improvements Provision						
102	Customer Relationship Management Project						
128	Outage Management Systems Replacement & Distribution Management Project						
136	Outage & Phase Identification Project & Tools						
158	Business Intelligence Project - Stage 2						
166	Data Warehouse - Replacement						
186	Document and Records - Archiving and Decommissioning Project						
198	Geospatial Information Systems - Upgrade						
246	SAP Works Management - Change Provision						
262	Field Mobility Project - Stage 2 Inspections and Works Management						
264	Field Mobility Project - Stage 3 Implementation & Completion						
272	Field Mobility Project - Communications & Truck Hot Spots						
302	Software Application Upgrade - NMS (SCS)						
306	Software Application Upgrade & Merge the 2 SAP Systems						
320	Software Application Upgrade - NMS (ACS)						
Sub Total		**$3,719,398**	**$10,008,611**	**$8,821,488**	**$7,833,002**	**$5,795,225**	**$36,177,723**
IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement)		$5,486,978	$7,212,198	$8,011,936	$3,301,856	$2,942,948	**$26,955,915**
Total Major Investments		**$9,206,376**	**$17,220,809**	**$16,833,423**	**$11,134,858**	**$8,738,173**	**$63,133,638**
All Other Investments		$12,153,981	$5,757,535	$5,445,665	$7,310,083	$10,008,876	**$40,676,140**
Total IT Program of Work		**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**

Investments by type of investment are detailed in Table 5 – IT Capital Expenditure by Type of Investment.

Table 5 – IT Capital Expenditure by Type of Investment

Category	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total	% Share
New Capability	$9,126,215	$4,179,612	$2,513,837	$2,552,022	$2,453,997	**$20,825,682**	20%
Systems Replacement & Retirement	$4,923,233	$10,940,197	$13,679,271	$7,667,032	$1,960,751	**$39,170,483**	38%
IT Asset Upgrade	$3,158,666	$3,618,147	$1,574,075	$3,653,616	$9,483,809	**$21,488,312**	21%
Extend, Remediate & Change	$3,770,941	$3,809,088	$3,880,458	$4,059,298	$4,340,416	**$19,860,200**	19%
Growth	$381,302	$431,301	$631,449	$512,972	$508,077	**$2,465,100**	2%
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**	**100%**

IT OPERATIONS

The JEN EDPR 2016 IT opex forecast is based on the current 2013/14 actual plus forecast costs as the baseline cost.

1. INTRODUCTION

1.1 PURPOSE

The purpose of this document is to define the Information Technology Asset Management Plan (IT AMP) for the Jemena Electricity Network (JEN). The IT AMP primarily focuses on the 2016 – 2020 regulatory submission period, but also includes a 20-year financial forecast to 2035.

JEN provides electricity distribution services to more than 310,000 customers in a geographic region covering over 950 square kilometres of north-west greater Melbourne.

The IT AMP provides a summary of the proposed capital program of work that will be undertaken to service customers across the Jemena Electricity Network.

The AMP excludes non-regulated IT assets and capital projects.

Jemena operates a shared IT service model for provision and delivery of IT Operations and supporting the IT Capital Program of Work. From 2010 Jemena IT (JIT) had engaged EB Services to provide support services for IT operations and shared capital projects. EB Services was formed by Jemena's parent company Singapore Power International in 2009/10 to share IT operational systems, systems development and costs for its subsidiaries Jemena and SP Ausnet. Effective from 1 October 2014, staff required to support Jemena IT requirements have been transitioned from EB Services across to Jemena IT.

1.2 PLANNING PRINCIPLES

For each asset group, the plan focuses on optimising the lifecycle costs for that asset group. This encompasses asset acquisition, creation, operation, maintenance, renewal and disposal. The plan makes provision for the number of assets and services required to meet all obligations in accordance with the defined business requirements, service levels, ensure capacity to meet future demand and that costs, risks and system performance is maintained throughout the asset lifecycle phases.

The AMP covers the 6-year period up to and including CY 2020 i.e. the completion of the current EDPR 2011 and the future EDPR 2016 period.

1.3 IT CAPITAL PROGRAM DEVELOPMENT

The IT capital program has been prepared based on good industry practice for asset lifecycle management. The methodologies adopted ensure that assets can be sustained in good working order and remain capable of providing optimal performance and returns over the full lifecycle of the asset. These processes are governed and managed in accordance with a combination of Jemena IT Strategy, IT policies and application and infrastructure roadmaps. IT capital program development takes into consideration a range of factors including risk, availability of vendor support, serviceable technology platforms, licensing, security and maintenance costs. The outcome of the assessment process also informs what assets are to be retained or replaced at the end of their useful or economic life.

This 6-year plan coincides with the JEN EDPR 2016 prices reset submission to the Australian Energy Regulator which consists of the calendar years 2016 through to 2020.

Each asset category plan is developed to optimise the entire lifecycle management process including performance, cost to acquire, cost to operate and likely migration or upgrade path.

The asset categories have whole of life asset management plans with the following types of program work and capital investment.

1.3.1 NEW IT CAPABILITY

The acquisition, development and implementation of new system assets to meet a business purpose not currently enabled or supported by information technologies.

1.3.2 IT ASSET EXTENSIONS, REMEDIATION AND CHANGES

The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

1.3.3 IT ASSET GROWTH

The provision for growth encompasses increased needs to meet:

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

The growth is driven by new customers and connections, network growth, increased energy demand and increased usage of current IT systems, information and data.

JEN's weighted average growth has typically been about 2% per annum over the EDPR 2011 period excluding the addition of new systems capability. This growth percentage translates as 1% growth in users, devices, and licenses due to economies of scale. The business and IT demand is growing faster than the JEN work force.

Additionally, data and storage capacity growth is averaging 15% compound rate per annum as at 2014 resulting from greater use of information and data taking place as well as the cumulative effects of data retention reflecting a major IT industry trend.

1.3.4 IT ASSET UPGRADES

This type of expenditure is to perform upgrades on existing IT assets and does not involve any replacement of an asset.

Software application assets are upgraded based on 3 to 5-year cycles depending on the assets and the policies of the vendors for the frequency of upgrades.

Most IT Infrastructure assets are replacements rather than upgrades for three reasons:

- The economic business case makes replacement more cost efficient.

- 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.

Upgrade costs have been estimated at 10% of the original asset creation costs including acquisition, development and implementation.

1.3.5 IT ASSET REPLACEMENT AND RETIREMENTS

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 also be triggered where an economic justification can be made where the cost of retention is greater than the cost of replacement.

In some instances assets may become redundant due to systems consolidation, new strategies and new technologies where the existing asset is shut down and disposed of without the need for replacement.

2. BACKGROUND

2.1 IT SERVICE PROVISION

Jemena Business Solution capabilities are delivered via a range of Information Technologies and Business Solutions. This blend of solutions supports both the unique electricity requirements and the enterprise requirement of Jemena. These solutions can be broadly categorised into four sets of core services which are:

- Business Process Automation.
- Information and Records Provision.
- Connecting with Customers.
- Productivity Tools.

The provision of IT services is based on a shared services model with funding and resourcing of services split across the Jemena Group of companies. The cost of service provision and solutions that are solely applicable to the electricity business are fully allocated to JEN.

Several IT systems under management which are referenced in this section are unique to JEN while others are enterprise based solutions and used by multiple business divisions. A fully defined Cost Allocation Methodology is used to both define and apply costs in a fully transparent manner. A new IT cost allocation model was recently developed using 2013/14 actual financials, number of users, IT inventory and data demands at a more detailed level of granularity for IT measures and costs. The new model has been applied from 1 July 2014.

JEN is one of the major distribution assets owned and operated by Jemena. JIT manages the provision of all IT capability, operations and program delivery. IT services are provided via a combination of internal and external parties, in summary external service provision supports:

- Large projects that are primarily delivered using external systems integrators selected by market tender.
- Small scale projects which are subject to competition and delivered by a blend of in-house staff, external IT solutions development organisations and contractors.
- Legacy maintenance agreements and services which will be moved to standard support agreements based on adoption of new technologies.
- Communications links and services currently outsourced to Telstra.

2.2 IT ASSETS DESCRIPTION

2.2.1 ASSET CATEGORIES AND EXPENDITURE TYPES

The Information Technologies are described by category that reflects the business purpose of those systems. The categories are:

1. Regulatory Requirements and Market Operation Services

The regulatory and market services encompass information systems functions and facilities required to meet regulatory obligations and to comply with all non-energy government regulations.

JEN provides a range of service to the electricity energy market via demand, supply and load management systems and for the short term trading market.

2. Corporate and Office Systems

The corporate and office systems encompass the corporate and back office functions of JEN. The enterprise systems cover IT solutions used by the entire business including office systems, intranet and general reference information. The functions include corporate desk top tools and mobility devices.

3. Finance and Accounting Systems

The finance and accounting systems encompass the corporate and back office functions of JEN. The enterprise systems cover IT solutions used by the entire business including governance, risk and compliance tools and SAP financial systems.

4. Human Resources, Safety and Incident Management Systems

The human resource, safety and incident management systems encompass the corporate and back office functions of JEN. The enterprise systems cover IT solutions used by the entire business including management of human capital, self-service HR management, learning systems, payroll, environment, health and safety and incident management.

5. SAP Lifecycle Management

The SAP lifecycle management systems encompass the corporate and back office functions of JEN. The enterprise systems cover IT solutions used by the entire business including application lifecycle initiatives, data management, archiving extensions and retirements and SAP alignment.

6. Customer Systems

The customer systems encompass all interaction with JEN's customers including the end consumer of energy. The Customer systems consist of those systems required to engage with and service end customers, retailers, providers and transmission businesses.

The customer systems include systems devoted to the protection of assets from third party interaction with the asset.

7. Outage Management (OMS), Distribution Management (DMS) and Emergency Management Systems

The OMS, DMS and emergency management systems encompass all interaction with JEN's management of the performance of the network as a physical asset and to distribute electricity. The systems consist of outage, distribution management, demand and emergency management capabilities businesses.

8. Business Intelligence, Reporting and Data Warehouse Systems

The business intelligence, reporting and data warehouse systems encompass corporate and back office functions of JEN. The systems cover IT solutions used by the entire business to manage data collection, storage and presentation for internal and external requirements

9. Document, Records and Content management Systems

The document, records and content management systems encompass corporate and back office functions of JEN. The systems cover IT solutions used by the entire business to manage, maintain and enable access to documents (be they reports, drawings, photographs or the like) required to manage the business.

10. Geospatial Systems, Mapping and Asset Imaging Systems

The geospatial asset class encompasses all systems solutions that provide geospatial location information, mapping, asset images, aerial images, geological images, geospatial related asset data and integration with external parties. Those parties include Government departments, service providers, sub-contractors and construction partners.

11. Asset Construction and Field Services Systems

The asset construction systems assets encompass program, portfolio and project management solutions. The field services assets are those software applications and mobility technologies used by managers, supervisors and workers in the field for planning, construction and for works management including maintenance, inspections, outages and materials management.

12. IT Infrastructure Management

The IT infrastructure category encompasses all hardware technology platforms, communications, operating environments and data systems needs to operate the application solutions. IT Infrastructure has been broken down into sub-categories of:

- Data Storage and Management
- Platforms and Processing
- End User Services
- Security Services
- Systems Management and Operations
- Communications and IT Network Services
- Facilities and Data Centres
- Systems Capacity Growth

13. Integration with the Supervisory Control and Data Acquisition (SCADA) and Real Time Systems (RTS)

The SCADA and RTS solutions are the subject of an independent EDPR 2016 submission category and assessed by the AER separately to IT Systems. There is however a very close relationship between the network assets supported by SCADA, Corporate and Asset IT systems.

Currently JEN's SCADA-RTS systems are operated and managed as standalone solutions from JEN's IT systems but they are still required to share common data between them. This is facilitated by manual intervention and file transfer processes and lacks real time integration benefits.

Jemena's IT division provides technology platforms and communication for real time systems including SCADA and network performance management. The SCADA solutions are managed by the Network Operations and RTS support team.

A core part of the overall JEN technology strategies for the EDPR 2016 is to gain the benefits which are yet to be realised of converging IT and OT systems enabled by:

- A consistent approach to data management and usage across IT and SCADA-RTS systems.

- Establishment of authoritative sources of data, including the management, data provision, data analytics and management reporting can be exchanged in real time or near real time, between dependant systems.
- Convergence over time in the management of IT infrastructure, facilities, network communications, security, and enabling technologies of SCADA and IT systems at the time of replacement to gain economies of scale benefits and simplified IT operations management.
- Increase the business intelligence and decision making capability by having SCADA, GIS, OMS, DMS and NMS all consolidating information in the one data warehouse for enhanced data analysis.

By converging and integrating IT and SCADA systems JEN will be in a position to better manage and operate the network.

14. Metering Infrastructure (SCS)

The metering systems encompass all functions relating to the provision of electricity meters, their operation, maintenance and support and meter data in a contestable environment.

15. Metering Infrastructure (CROIC)

The metering systems encompass all functions relating to the provision of electricity meters, their operation, maintenance and support and meter data in a non-contestable environment.

At the conclusion of the metering derogation, electricity meters are to become contestable from January 2016.

JEN currently believes that current systems can be leveraged with new billing and data distribution capability provided to new market participants. The capex required is likely to be made a pass through cost by the Australian Energy Regulator.

The Contestable Metering Project will be part of the JEN Program of Work taking highest priority as a mandatory regulatory initiative and obligation.

Once the detailed Contestable Metering rules and requirements are released by the AER and the role and systems proposed for AEMO is defined, JEN will provide a detailed project plan and costings to support the initiative.

3. STRATEGY

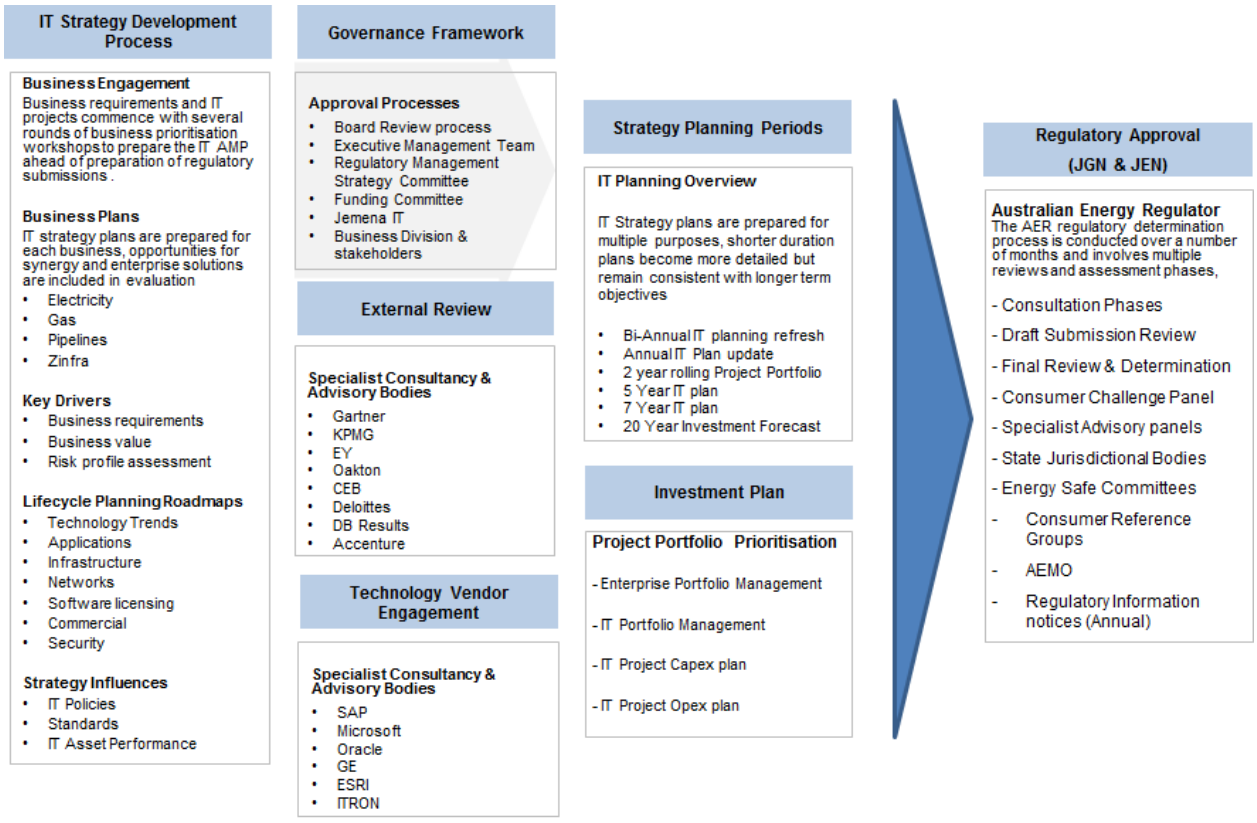
3.1 JEMENA ELECTRICITY NETWORK'S BUSINESS STRATEGY

The strategy for the period 2016-2020 focuses on initially establishing a foundation for the future operation of the organisation which can be further enhanced to achieve the vision to be a world class owner and manager of energy delivery assets and further extended to capitalise on new opportunities that arise. Key IT implications and expectations of JEN business plans are summarised below:

- Respond to changing regulation, pricing and other compliance.
- Implement new capability that brings JEN up to the level of most Australian Energy Distribution businesses with the extension of Geospatial Information Systems, data warehouse and analytics and field mobility.
- Continue the successful simplification of the operating model by enabling the next stages with improved information, management of human capital, new systems and technologies.
- Leverage social technology platforms to expand communication mediums during emergency management events.
- Deploy Field workforce mobility solutions to improve outage response and asset and works management.
- Leverage platforms for office collaboration and productivity.

The process and methodologies to develop the SGSPAA IT Strategy have multiple dimensions refer Figure 1 that are reflected throughout the development of the JEN IT strategy.

Figure 1 – Processes and Methodologies to Formulate the IT Strategy



3.2 TECHNOLOGY TRENDS

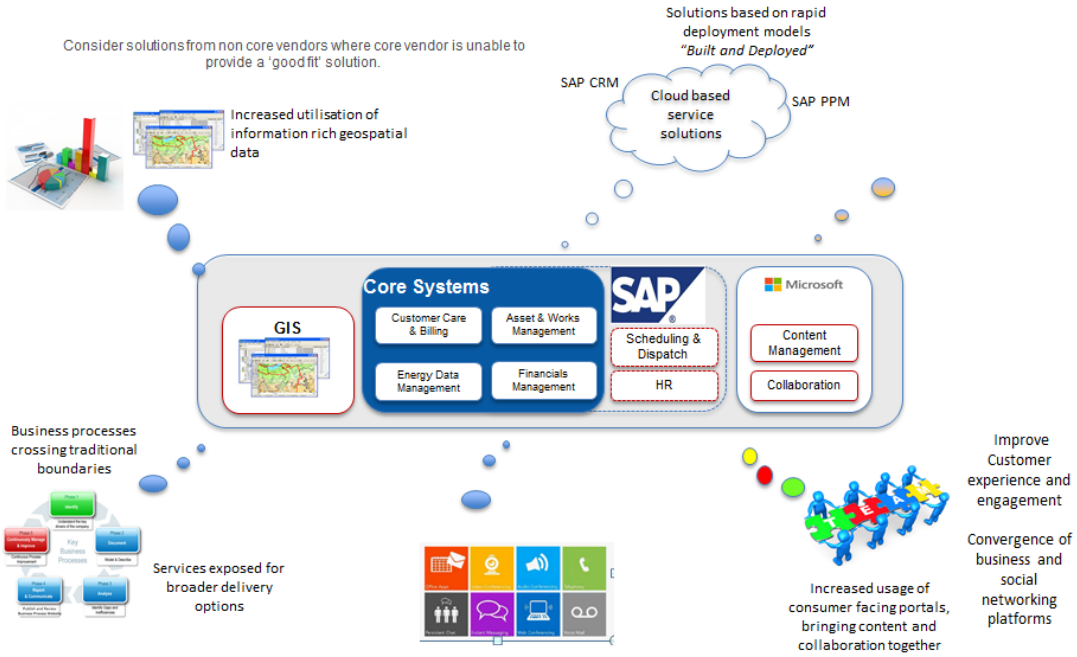
The following technology trends refer Figure 2 and disruptive technologies contribute to the challenges in developing the IT strategy.

Figure 2 – Technology Trends

3.3 FOCUS TOWARDS 2020

Towards 2020, the shift and focus is to deliver new capability rapidly “around the edges” of core IT assets refer Figure 3 – Investment in New Capability around the Core.

Figure 3 – Investment in New Capability around the Core



3.4 STRATEGIC BUSINESS OBJECTIVES

The Jemena business plan identifies the following strategic objectives:

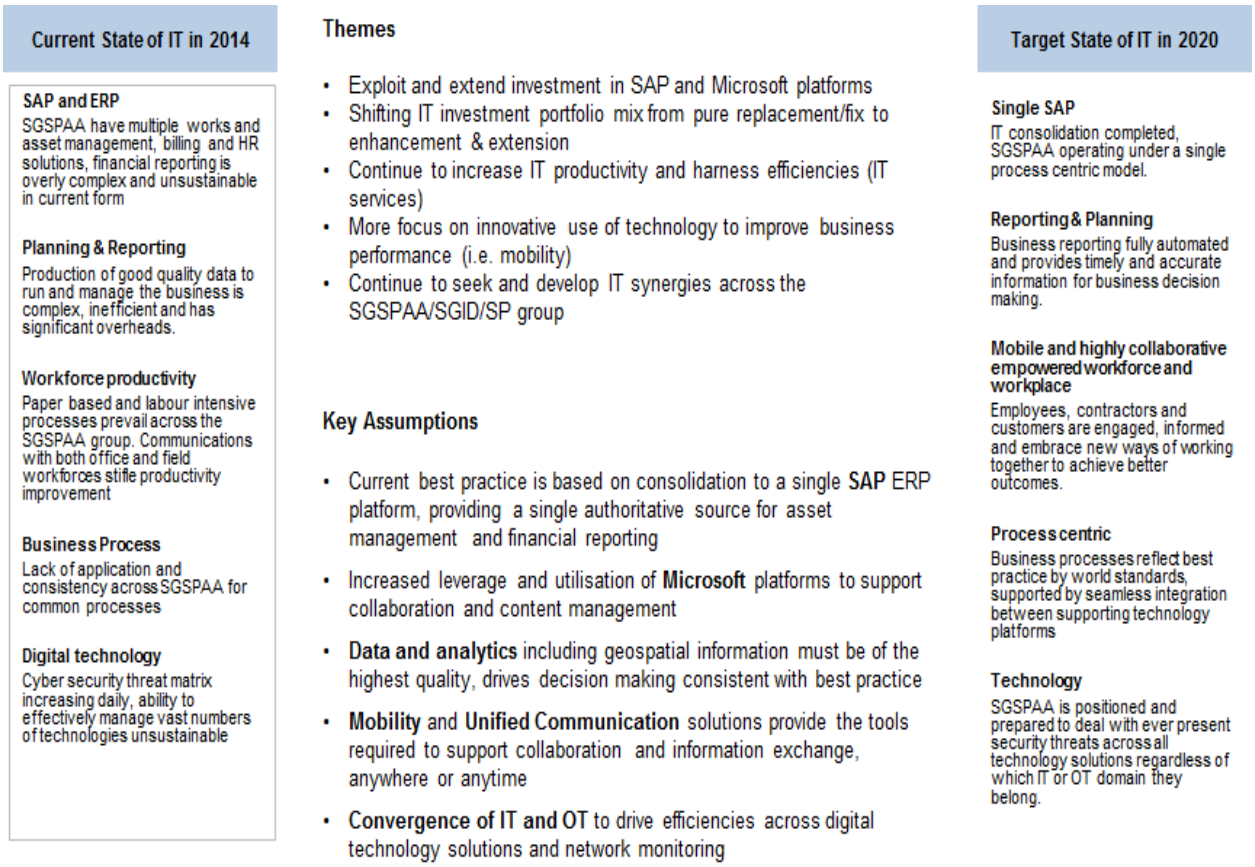
- Safety – embed a world class safety culture.
- Employees – be a high performing and engaged workplace that attracts, develops and retains industry leaders.
- Customers – deliver customer focused operational excellence.
- Asset Management – have highly efficient operations, be an influential market leader with strong customer, regulatory, stakeholder and community relationships, and achieve regulatory outcomes aligned to the business plan.
- Return on Investment – deliver financial performance that is superior to industry peers.

3.5 IT STRATEGIC OBJECTIVES

Jemena IT manages the IT assets and associated technology risks to provide a systems environment that supports the Jemena business and ensures regulatory obligations are met.

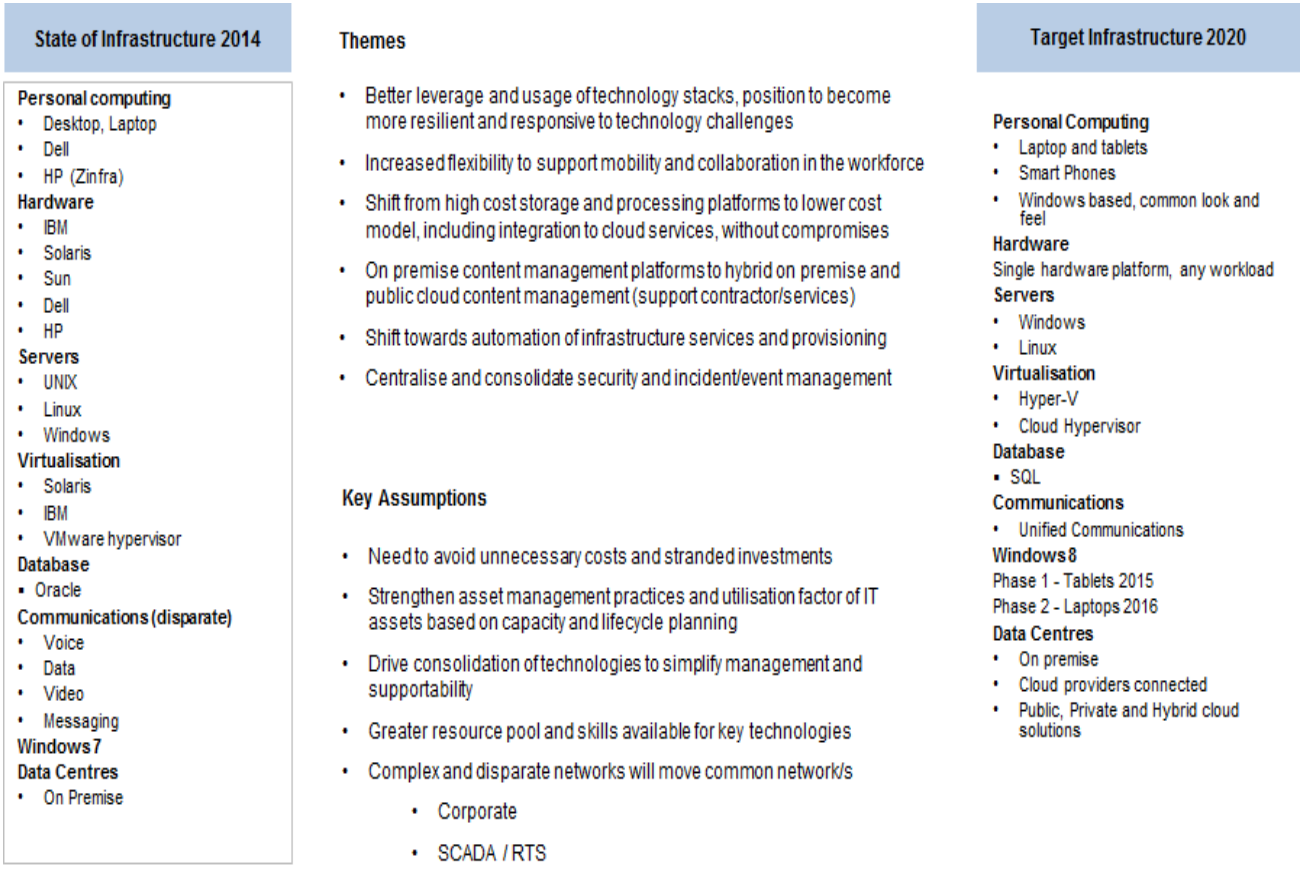
In summary the JEN IT objectives are centred on the following themes and key assumptions identified in Figure 4 below.

Figure 4 – IT Themes and Assumptions



The technical infrastructure directions that will guide the strategy are detailed Figure 5 below.

Figure 5 – IT Technical Infrastructure Directions



Infrastructure will be developed to deliver the directional themes identified for the target infrastructure.

3.6 IT ALIGNMENT TO BUSINESS OBJECTIVES

The IT Strategy aligns to the business strategy by providing the solutions and enabling technologies to support business plans and energy market growth while providing sustainable low risk information and operating technologies.

The primary aims of the EDPR 2016 period are to:

- Provide the capability for AER requirements for customer relationship management and supporting data.
- Comply with new metering contestability market and rules.
- Provide new and extended system capability to support improved Governance and Risk Management.
- Bring Jemena Information Technology capabilities up to equivalent Australian energy distribution businesses with the improvements to its Geospatial Information System, Data Warehouse, Digital Analytics and Field Mobility.
- Continue the rationalisation and consolidation of systems to improve information management and support further workflow automation.
- Implement systems deferred from the EDPR 2011 period due to the time, work effort and funding required to support new AER requirements post determination.

3.7 GUIDING PRINCIPLES

Jemena's IT strategy focuses on initiatives and processes that align the objectives of the business and IT capabilities to deliver superior business outcomes and deliver greater benefits to customers.

Guiding principles are used to ensure that prudent investments are made in IT and that the business systems, infrastructure platforms and services deliver better outcomes.

The overarching strategic principles that apply to JEN include:

- Operate as a portfolio model of separate, integrated businesses, leveraging scale and enterprise capabilities.
- Ensure logical data separation whilst leveraging enterprise investments.
- First seek to adopt industry best practices available through package software offerings to deliver business requirements.
- Simplify and standardise processes and technology.
- Implement an architecture based on an appropriately balanced mix of fixed and variable cost infrastructure.
- Be operationally efficient, customer focussed and commercially strong.
- Investments are measured by Total Cost of Ownership (TCO).
- Business decisions will help guide investment decisions.

3.8 IT STRATEGIC PLAN

To enable the business to be an industry best practice asset management organisation JEN will focus on:

- Efficient services to meet obligations – managing exceptions rather than business as usual activities.
- Being process focussed – understanding the end to end service and effectiveness.
- Being customer centric – enabled through solutions to suit customer needs and deliver on obligations (e.g. new connections).

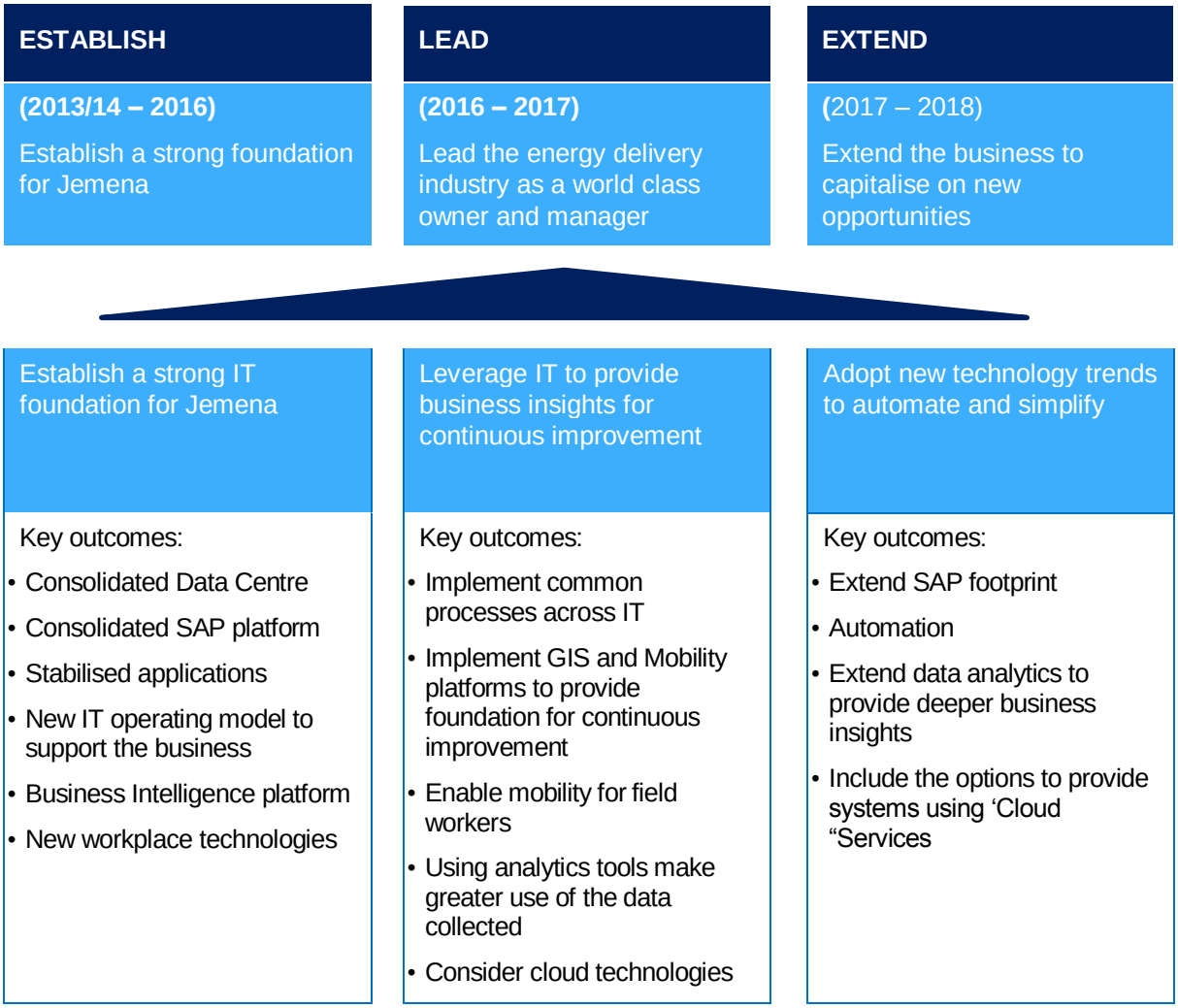
The IT plan delivers key outcomes that aligns and supports Jemena's business plan across the three phases of Establish, Lead and Extend. The IT Plan will deliver:

- New foundation capabilities such as field mobility, governance and risk management, data warehousing, Program and Portfolio Management, employee management, skills and learning management and Customer Relationship Management.
- Information consolidation and convergence through establishment of common information models, taxonomies and deployment of data warehousing and BI capabilities.
- Process models and system architectures managed via a dedicated ARIS repository, ensuring alignment of processes to IT services and systems and management of intellectual property.
- Reduced risk and ensure currency of technology through lifecycle upgrades, maintenance and enhancements.
- Required capabilities and enhancements to manage regulatory compliance including metering contestability and Power of Choice.

- Convergence in the management of Information Technology and Operational Technology to drive operational efficiencies.
- Adoption of new technologies to deliver data analytics and predictive analysis capabilities, leverage cloud service opportunities such as Infrastructure as a Service (IaaS) and SaaS (Software as a Service).
- Support for multichannel integration and enhanced mobility platforms to support BYOD (Bring Your Own Device), customer portals, Field and Corporate Mobility.

The IT plan delivers key outcomes that align and support Jemena's business plan across the three phases of establish, lead and extend. The IT strategic planning phases are represented in Figure 6 below.

Figure 6 – IT Plan Phases



Establish

Over the past several years, IT has focused on building a strong technology foundation to support the Jemena business centred around:

- SAP as a core platform.
- De-cluttering through harmonising applications across assets.

- Consolidation of data centres and uplift and modernisation of Infrastructure capability.

Work already undertaken has resulted in a stabilisation of applications and a significant decrease in the number of incidents effecting business operations.

Lead

The intent of the Strategic plan is to build on the foundation that has been established and leverage new functionality and data available to provide insights into the business.

Embedding common processes resulting from the business transformation will begin to deliver process efficiencies. Metrics related to new processes can be collected and monitored for ongoing opportunities for continuous improvements.

As the business operating model changes are implemented and the move to a new location occurs there is an opportunity to build a workplace for the future that engages employees through the use of a mobility enabled platform and collaboration tools to improve efficiencies for Jemena employees.

Extend

The next stage of the IT plan extends the established leader position with new technology trends to automate and simplify processes further.

The investment in SAP can be further leveraged with particular focus on building new capability for customer relationship management and potential to leverage the data components of the platform.

The process centric focused business model and gathering metrics will identify areas where opportunities exist to further refine and automate end to end processes. This will enable Jemena to focus on managing exceptions rather than business as usual type.

Extending data analytics to provider deeper business insights will be an ongoing process where availability of additional data feeds and consolidation of OT and IT data can be brought together for proactive complex analytics in order to improve asset maintenance and management.

3.8.1 IT ASSETS STRATEGY

The core strategies for JEN for the EDPR 2016 have been defined and are underpinned by the regulatory requirement of delivering prudent and efficient capital investments. These strategies are:

- Comply with current and new regulations by providing enabling systems solutions.
- Continue the journey that brings JEN up to the capability of Australian energy distribution services providers by implementing and using contemporary IT systems solutions and applications.
- Continue the enhancements and replacement of current systems solutions as a key enabler of ongoing business improvements in services to the Australian energy market and end consumers of energy.
- Manage risk and avoid cost increases by conducting a rolling systems upgrade and replacement program to have all systems supported by vendors.
- Continue to consolidate multiple and overlapping systems by replacement to achieve fewer systems, less complex delivery and maintenance resulting in a lower business and IT cost to serve overall and per unit of service.
- Take advantage of proven new services and technologies tested by energy market benefits, business cases, competitive market tender and affordability.

- Mature the systems solutions to best practice standards for energy business and systems as defined by leading and recognised research organisations.

JEN will continue to improve BAU processes to support regulatory and delivery forecasting, building on the major achievements enabled by replacement and new IT systems.

Infrastructure and applications will continue to be managed through well-defined and updated Infrastructure Roadmap, Lifecycle Management Framework and business unit cost allocations.

Jemena requires reliable and timely forecasting and planning for IT infrastructure spend to ensure accurate and traceable regulatory submissions. The infrastructure roadmap will be reviewed and updated on an annual basis to underpin this. The creation and implementation of a Lifecycle Management Framework allows for clear understanding of upcoming capital allocation for infrastructure for the respective regulatory submissions.

3.8.2 IT OPERATIONS STRATEGY

Jemena has committed to becoming a process centric organisation. This, from an IT systems perspective, means that all business processes are mapped to IT services that support them. The benefits of this approach will be recognised via:

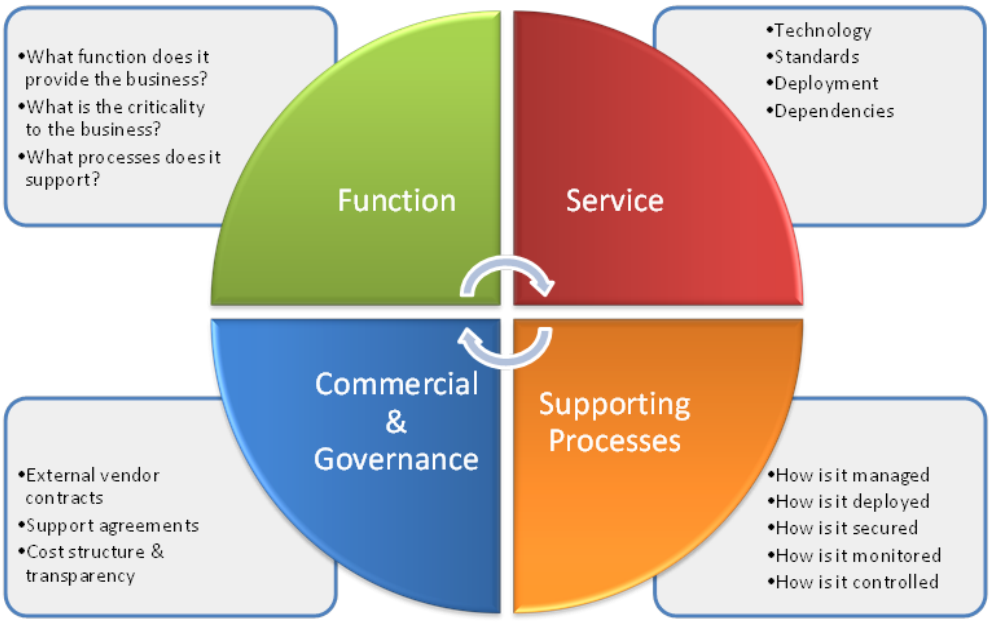
- Predictive change modelling with the ability to perform top down and bottom up reviews.
- A single authoritative source of truth and change management for Infrastructure, Architecture, Services, Applications and Business Processes.
- The capture of Intellectual Property maintained in a dedicated repository.
- Further benefits flowing from change impact assessments, risk analysis, design implications or project delivery dependencies and greater agility during implementation of change with less risk.
- A Technical Reference Model (TRM) to support the infrastructure meta-model for the Enterprise Architecture tool. TRM will describe infrastructure services and functions provided along with the current standards followed.

JIT maintains Services, Software Applications and Infrastructure Services agreements based on a set of services standards and recurrent IT activities. This process is to be enhanced by creating a Services Catalogue, documenting Capital and Operational costs of infrastructure services over a 5-year lifecycle by service.

- JEN continuously focuses on pursuit of operational efficiencies and scrutinising project evaluation decisions. A primary step in achieving both these outcomes is the constant drive towards cost transparency. Understanding where IT infrastructure costs lie and how they relate to business is fundamental to cost transparency, and is an iterative process as services and technologies change.
- To aid assigning IT costs to applications, the Infrastructure Service Catalogue will be reviewed and updated, documenting Capital and Operational costs of infrastructure services over a 5-year lifecycle, and used in conjunction with the Enterprise Architecture tool that maps applications to infrastructure, direct IT asset costs can be attributed to applications or used as inputs into cost / benefit analysis for project decisions.

The maintenance cycle components, planning required and considerations are represented in Figure 7 below.

Figure 7 – Maintain Cycle



3.8.3 STRATEGIC APPLICATION SOLUTIONS

Jemena currently uses the following strategic products that have originally been selected by competitive tender:

- SAP - Enterprise Resource Planning Solutions.
- Microsoft – Office application and productivity tools, systems development tools and document management systems.

The strategic products are mature systems solutions of best practice standards and widely used in energy businesses as demonstrated in research and benchmarking defined by leading research organisations such as Gartner.

3.8.4 IT SYSTEMS CURRENT STATE

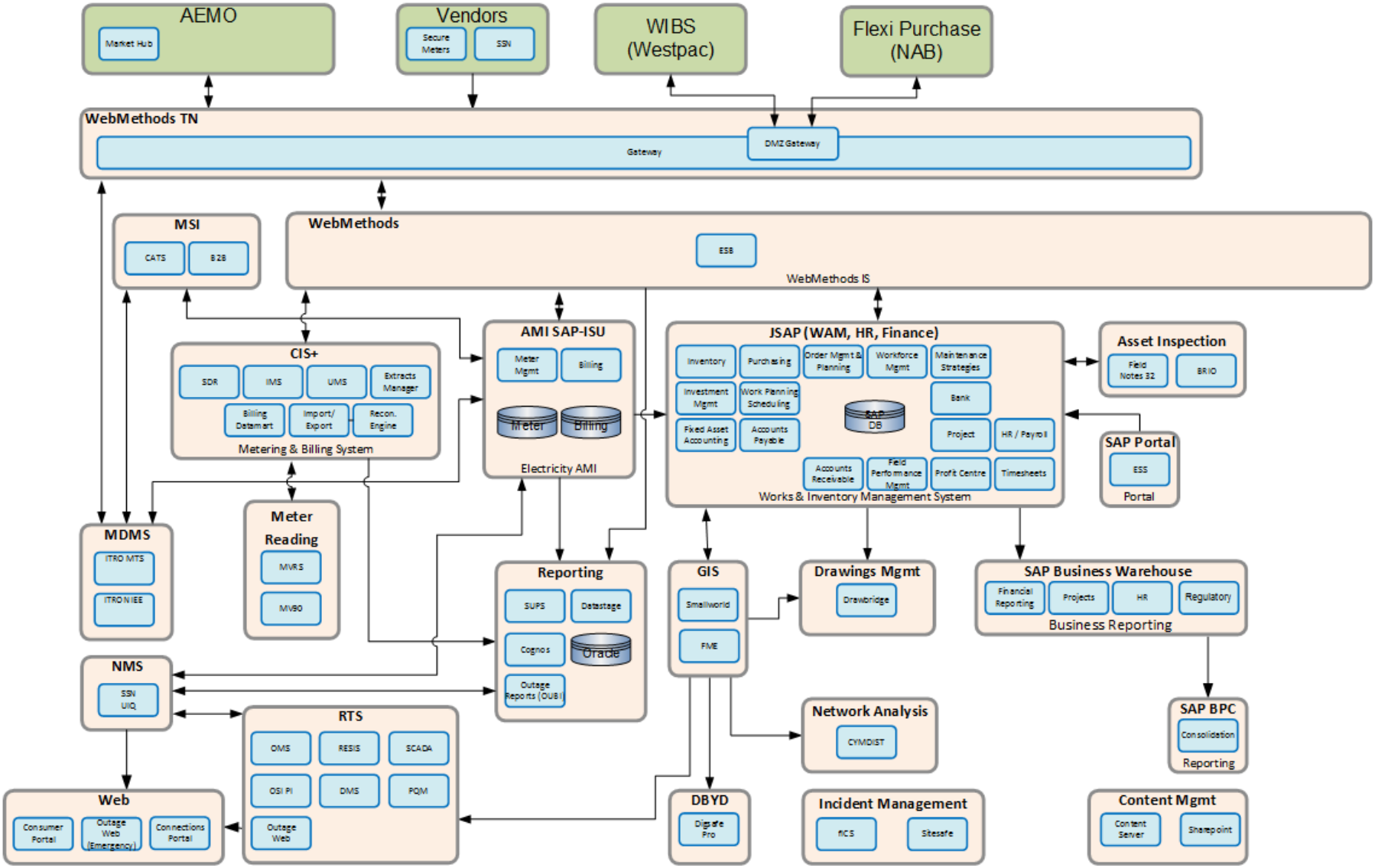
The JEN IT strategy for the current EDPR 2011 period has focused on simplifying the operating model, rationalisation of applications and reducing complexity and costs. These have been achieved in conjunction with delivery of major programs and establishing foundational capabilities to support the business. Key highlights, achievements to date are:

- SAP implementation and modernisation.
- Material improvements in IT opex progressively from 2009/10 through to 2013/14.
- Progressive simplification of the applications and technology landscape by systems, vendor and product consolidation.
- Complete the retirement of legacy systems including:
  - CIS+ customer, metering and billing solution.
  - Business Intelligence tools.

- Incident Management.
- Standalone human resources applications.

The current state IT architecture described in Figure 8 – Current State Logical Architecture, below, provides an illustration of the complexity of the separate solutions and the diversified applications implemented during the past 25 years.

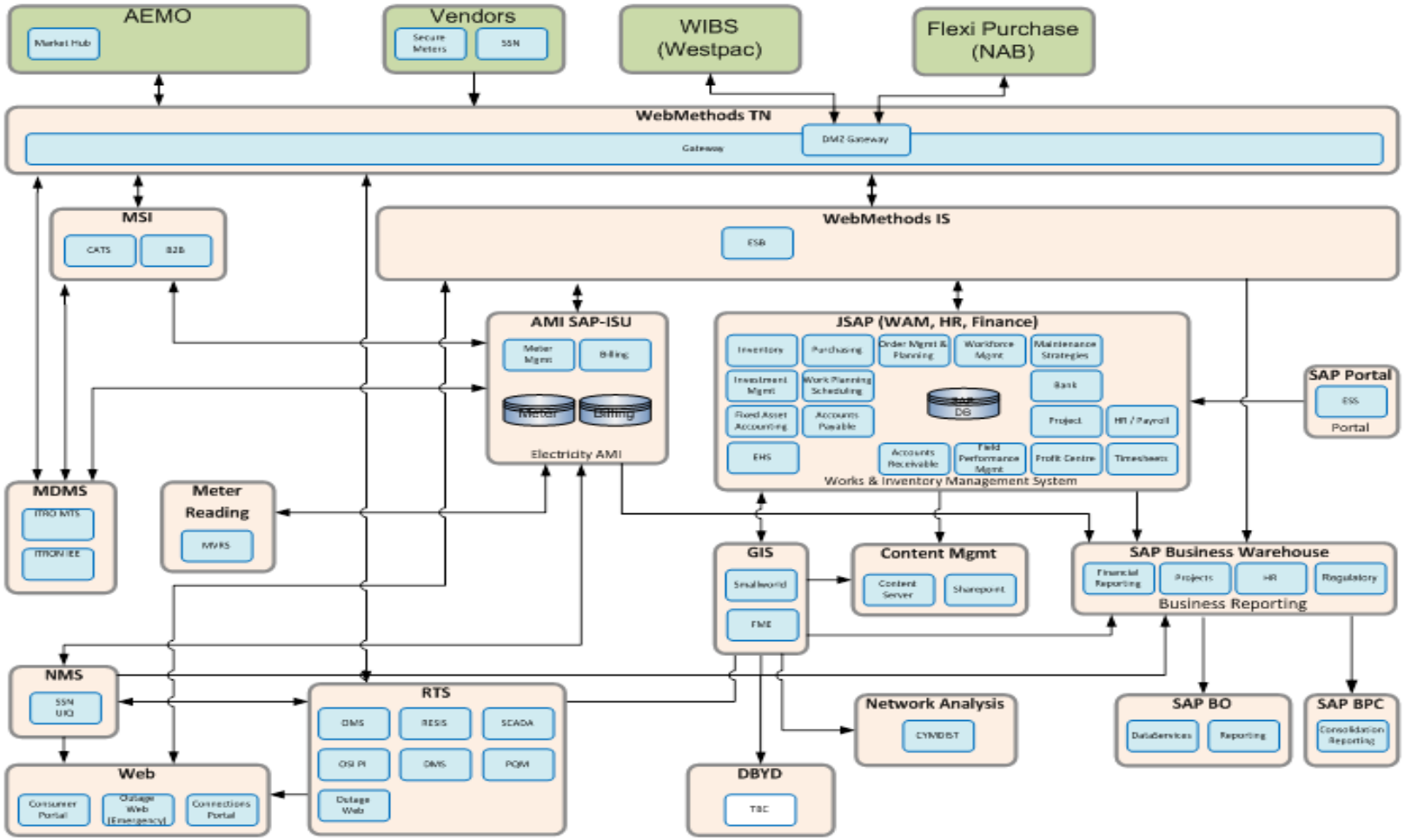
Figure 8 – Current State Logical Architecture



3.8.5 FUTURE STATE IT ARCHITECTURE 2020

Figure 9 below represents the planned future state of systems applications to be used by JEN as at the end of the EDPR 2016 period in 2020. Comparing the future state solutions to the current state demonstrates the consolidation of systems based on the SAP software applications.

Figure 9 – Future State Logical Architecture

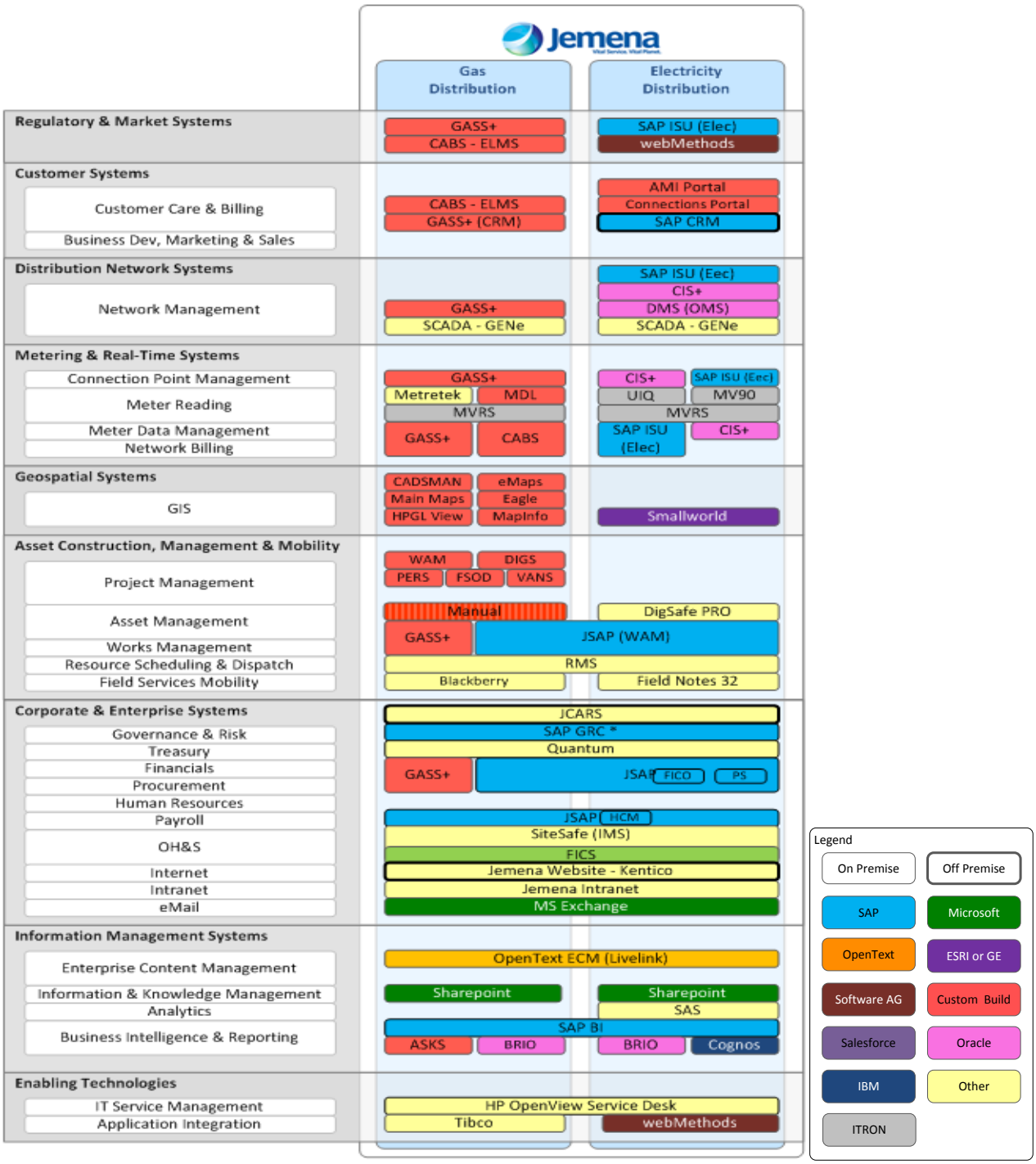


3.8.6 IT APPLICATION CONSOLIDATION

The application consolidation process is at the core of Jemena's prudent and efficient investment resulting in a streamlined application environment with fewer vendors. It also simplifies integration and upgrade paths and consolidates licensing costs and management.

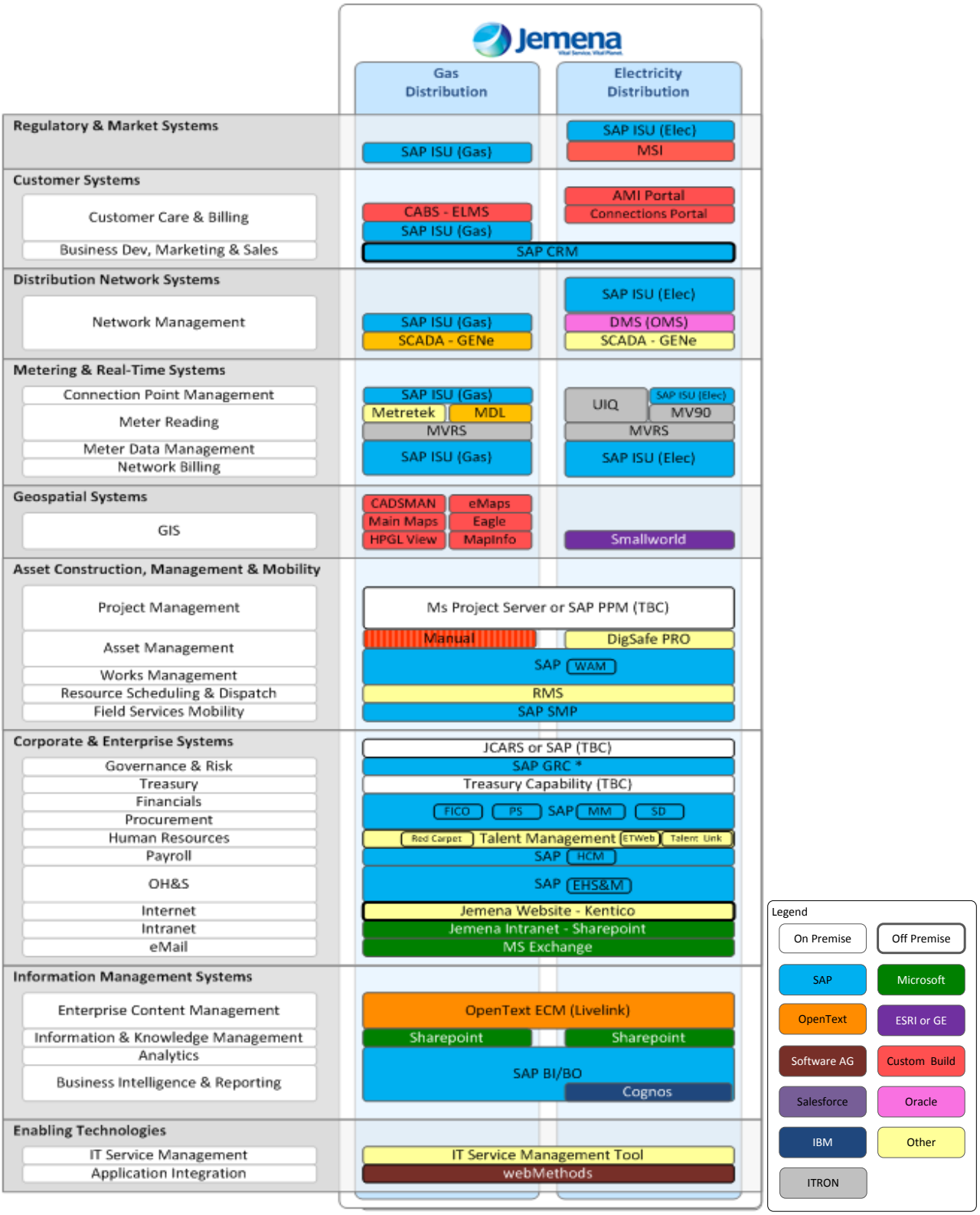
By the end of 2014 Jemena will have completed the JSAP relocation, consolidated data centres and commenced the transition of GASS+ to OneSAP refer Figure 10.

Figure 10 – Application Consolidation at 2014



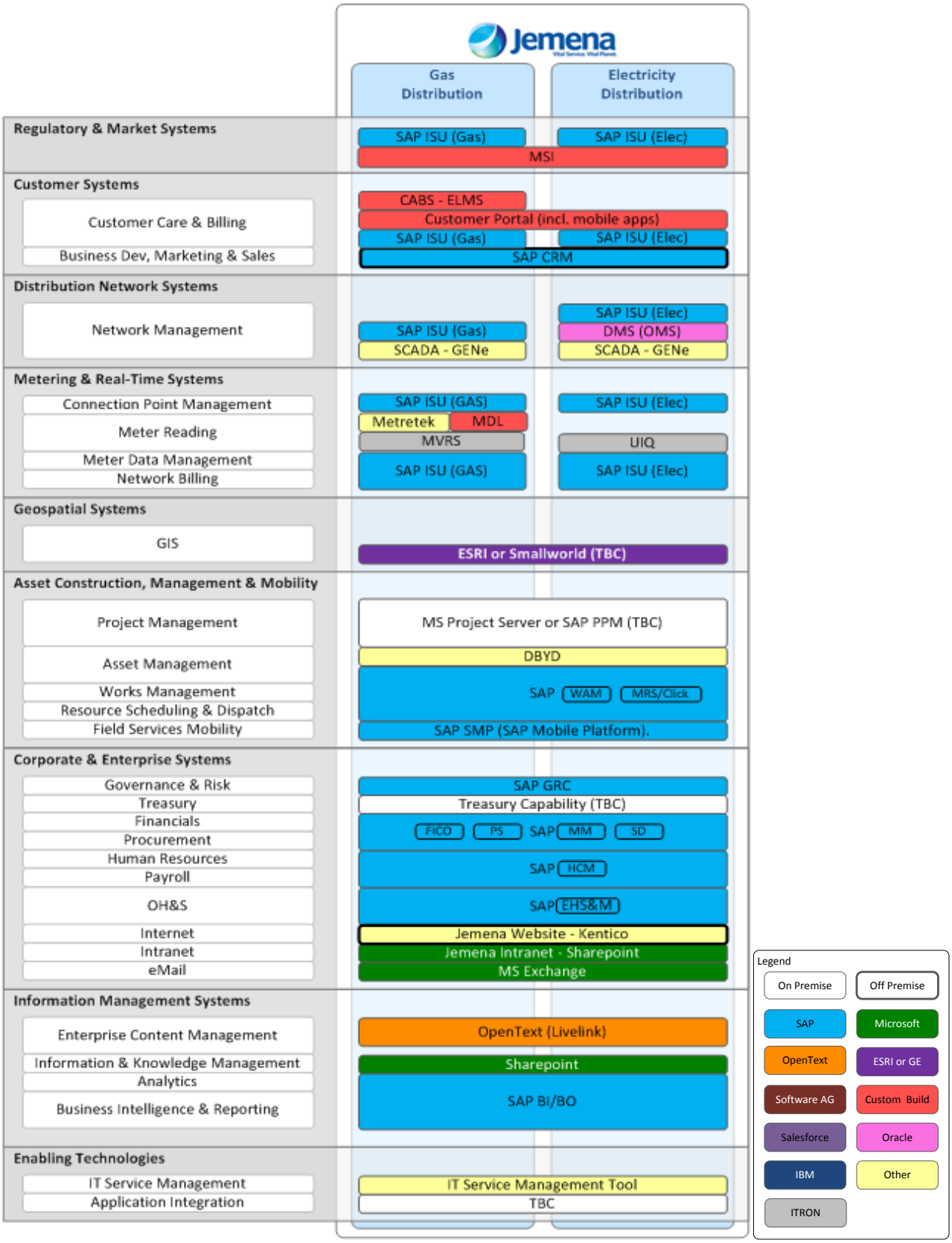
By the end of 2016, the foundation, using SAP and Microsoft product as core vendors, will be in place and aligned with IT Strategy Principles refer Figure 11.

Figure 11 – Application Consolidation at 2016



By 2020, the consolidation program will leave SGSPAA with approximately eight key IT partners which will reduce cost and complexity refer Figure 12.

Figure 12 – Application Consolidation at 2020



3.8.7 IT INFRASTRUCTURE STRATEGY

The infrastructure strategy focuses on major strategic infrastructure initiatives and their relationship to business goals and objectives described in respective business plans, regulatory submissions and Information Technology Strategy.

The scope of the infrastructure strategy is on the planning, implementation, operations and management of IT infrastructure services.

The following strategic principles are being used to provide guidance for the infrastructure strategy over the next several years:

- Convergence of IT and Operational Technology (OT) infrastructure from a procurement, process and technology perspective.
- Standardisation on commodity based infrastructure services.
- Further investment in orchestration and automation, including internal and external cloud services.
- Enterprise adoption and application of process centric based services.

3.8.8 COMMODITY BASED INFRASTRUCTURE SERVICES

JEN is making a strategic move towards commodity based infrastructure services for application enablement.

There is a worldwide trend towards the adoption of commodity based infrastructure services. This trend was initially being driven by software and hardware vendors responding to the pressure on IT capex and opex along with strong competition driven by businesses tender processes. Opportunities for functional improvements are now resulting in new value propositions for adoption of commodity based infrastructure services. In this scenario platforms become modular assemblages of lower cost hardware, operating systems and layered software with industry compatible technology.

The maturing profile of commodity based infrastructure services provides JEN with an increased number of options to manage growth in capacity and new infrastructure requirements. These options will be included for assessment in all business cases requiring additional IT infrastructure capacity. Capability assessment will be evaluated as a service provided by the vendor or providers of cloud computing services. The progressive move to environments based upon commodity services also greatly facilitates future adoption of cloud based services such as “Infrastructure as a Service” (IaaS) and “Platform as a Service” (PaaS).

For JEN this means meeting customer demand growth, higher rates of data usage and retention and the provision of new functionality at a much lower marginal cost, that might otherwise not be affordable or cost effective. An example is data storage demand is increasing at 15%-20% per annum but storage cost per unit has declined to offset the demand. It also introduces choice and flexibility to select different technologies at one layer without impacting other infrastructure services.

3.8.9 PREPARING FOR CLOUD BASED IT INFRASTRUCTURE

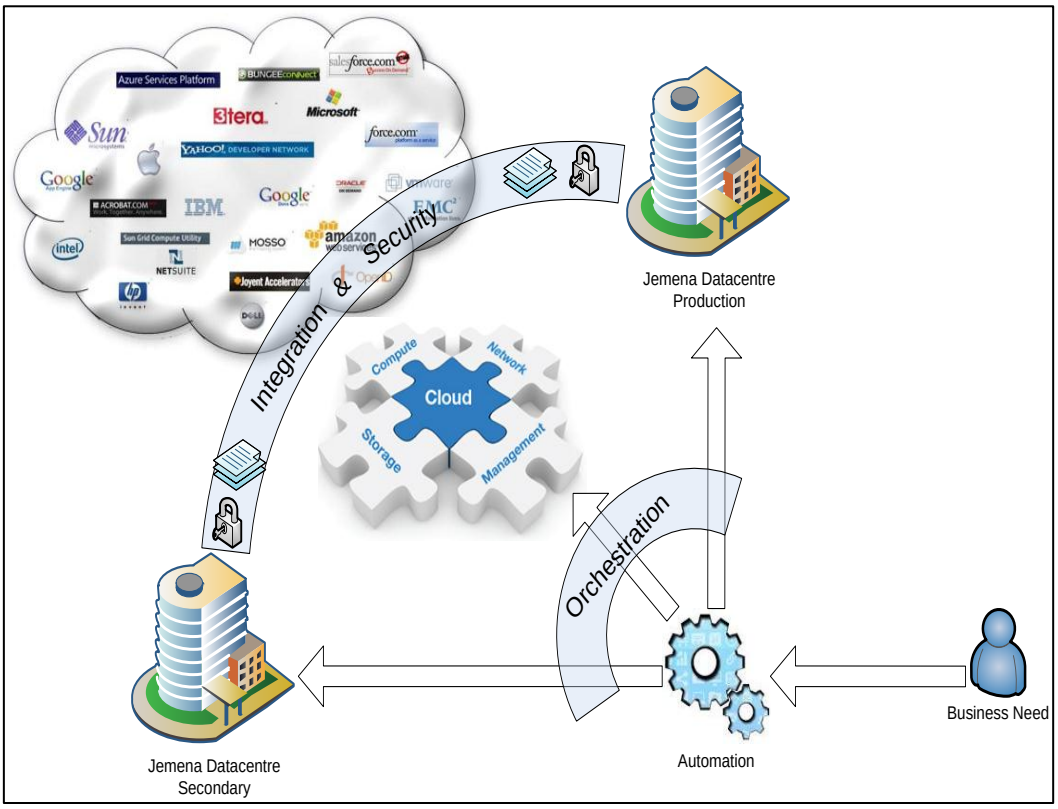
Jemena will continue to monitor and assess the viability of infrastructure in the cloud to ensure automation and orchestration services, integration options and security will be ready to adopt cloud services when it is prudent and efficient to do so. The automation and orchestration tools will integrate with cloud services seamlessly and appear as if they were on Jemena owned infrastructure.

Figure 13 – Preparing for Cloud Based Infrastructure below illustrates the major providers of cloud based IT Infrastructure services now on offer to the Australian IT market including a mix of local and internationally resident IT facilities. The cloud in the diagram shows the many vendors now in the market and demonstrates the major new service providers such as Google in addition to the traditional IT vendors such as IBM.

The key challenges are:

- Obtaining a mature and flexible service that is timely in its ability to add to changes in IT Infrastructure.
- A service management process that is efficient and not costly to manage.
- Efficiently integrating with Jemena's in-house systems and partner systems.
- Satisfying the security needs of having market services critical operation outside of Jemena's own operations and controls.

Figure 13 – Preparing for Cloud Based Infrastructure



Jemena has performed a major consolidation and rationalisation of infrastructure services through its recent performance improvement initiatives enabled by new technologies, market competition and rationalisation of vendors. This consolidation and rationalisation will further drive into Operational Technologies (OT) including SCADA and Real Time Systems (RTS) and result in consistent and repeatable processes for commercial arrangements, technology standards and supporting infrastructure services. This will include the replacement of legacy infrastructure technologies no longer adding value or being performed more cost effectively by new technologies.

3.8.10 FIELD MOBILITY

Field mobility is the capability to access actionable information anywhere, at any place and at any time.

To deploy a field mobility solution Jemena will need to manage information security, connectivity and deliver mobility for a multiple of different user styles.

For field workers, mobility objectives would be to:

- Reduce cycle times of work.

- Uplift information management through minimising data input and reducing manual touch points.
- Integrate data exchange.
- Increased flexibility for Jemena's in-field workers for fault despatch and job closure.
- Provide improved business intelligence and operational reporting through live work status reporting.

Jemena plans to complete a mobility blueprint and business case as part of the finalisation of the EDPR 2011 and to deploy mobility tools to the workforce during the EDPR 2016.

4. GOVERNANCE AND PROGRAM DELIVERY

4.1 OVERVIEW

Jemena's IT governance is a supplement to the core business governance and program delivery model and defines, for IT projects, who have input and who is accountable for implementing those decisions. The IT governance is an integral part of Jemena's corporate governance and requires alignment between the business and IT. The IT governance enables Jemena to make and implement IT decisions faster. It ensures that the Board, senior executives and managers have a standard and structured view of the IT programs of work, work in progress and status to make decisions with the necessary 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 environment and required project changes.

The IT governance operates through a framework of accountabilities, processes, and auditable and measurable controls that encourage the desired behaviour in the deployment and use of IT.

4.2 OBJECTIVES

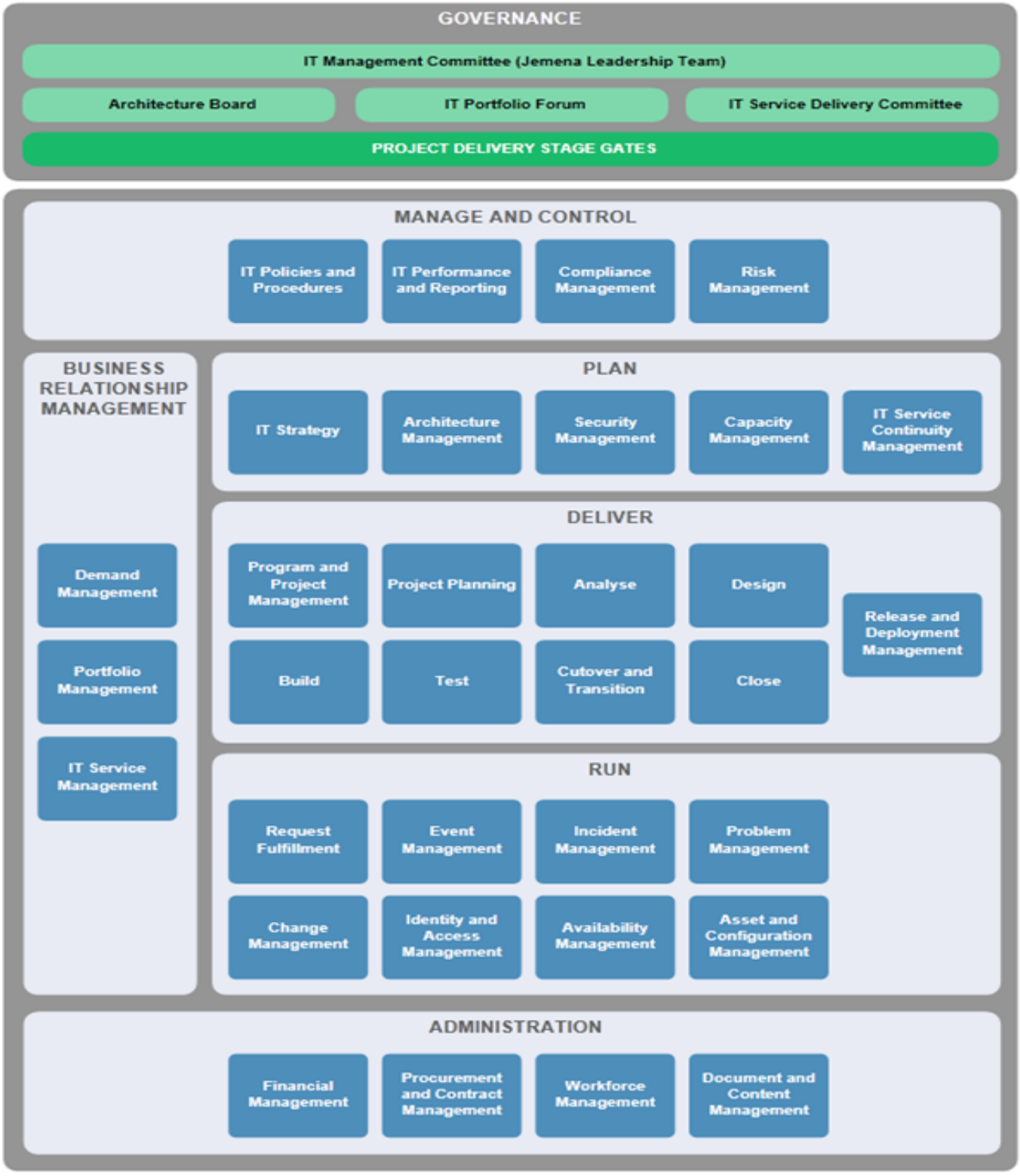
Jemena IT's objectives for recently updating the IT governance model are to:

- Confirm the model for IT Governance supporting the large-scale strategic business programs enabled by new and replacement technologies.
- 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.
- Ensure governance forums provide rigour, visibility and transparency on how IT will address business needs.

4.3 GOVERNANCE FRAMEWORK

Figure 14 – IT Governance Framework sets out the Governance Framework components described in this sub-section.

Figure 14 – IT Governance Framework



4.4 PROJECT DELIVERY AND GATES

The Project Delivery Methodology (PDM) has set review and approval points (gates) to ensure all Jemena IT projects are appropriately managed and governed in a consistent manner to ensure a quality outcome. The PDM is maintained by the Jemena IT Program Management Office (PMO) who also oversees the prioritisation of the annual project work and governance through the project lifecycle.

As the PMO identifies new or emerging technology changes it re-prioritises and adjusts the annual program of work as shown in Figure 15 – Project Prioritisation Process below.

Figure 15 – Project Prioritisation Process

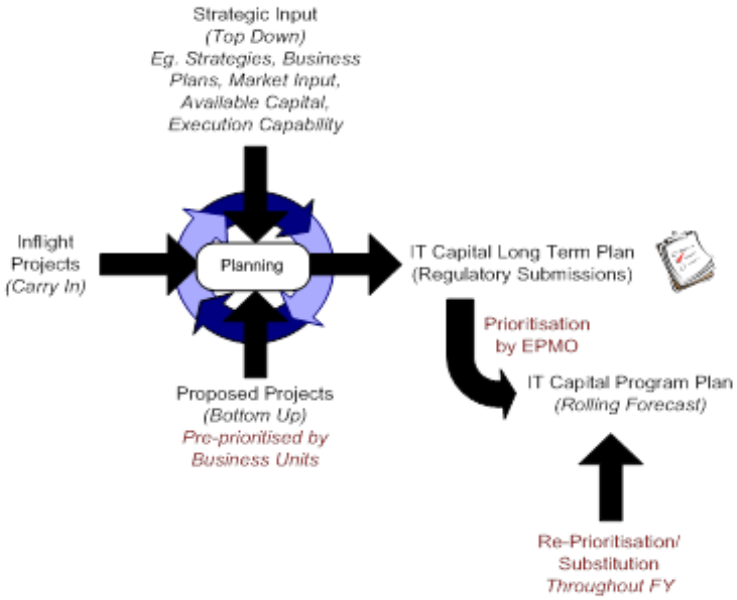
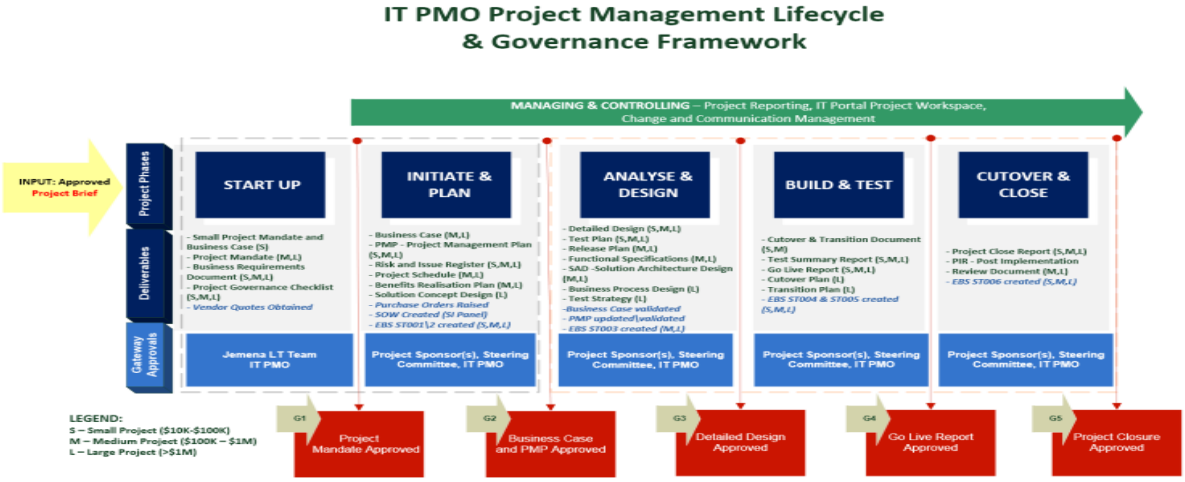


Figure 16 – IT PMO Lifecycle and Governance framework shows the project lifecycle and approval gates for the initiation and delivery of systems projects through to completion.

Figure 16 – IT PMO Lifecycle and Governance framework



4.4.1 PROJECT STAGE GATE 1 – COMMENCEMENT OF INITIATE AND PLAN STAGE

The approval of the Project Mandate by the Jemena Leadership Team, or IT Portfolio Forum for projects less than $2M, indicates the commencement of the Initiate and Plan stage of the project. The Project Mandate provides funding for the preparation of the business case, Project Management Plan (PMP) and conceptual architecture. Where necessary, the Project Mandate may also provide funding to undertake relevant procurement activities such as Request for Information (RFI) or Request for Tender (RFT).

4.4.2 PROJECT STAGE GATE 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, Project Management Plan (PMP), benefits realisation plan and conceptual architecture. Where relevant, procurement activities performed in the Initiate and Plan stage result in vendor signed contracts ready for execution.

The purpose of the Business Case is to present a compelling scenario to obtain executive approval and funding for the remaining activities of the project. It concentrates on the 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 $2M, and approved by members of the Jemena leadership team or business steering committee within their respective Delegated Financial Authority (DFA). All IT projects are required to follow and conform to the Jemena DFA and Jemena Procurement Policy at all times.

Upon approval of the Business Case, the Project Steering Committee (PSC) is 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 Business Case and PMP is the stage gate to move from Initiate and Plan into Analysis and Design.

During the Initiate and Plan stage, the Conceptual Architecture is presented to the Architecture Board for approval.

4.4.3 PROJECT STAGE GATE 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 / Design Stage of the project, the Project Manager reviews the following to provide information for the next stage (Build / 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 assesses if the PMP and Business Case need 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 will need to be reapproved 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.

4.4.4 PROJECT STAGE GATE 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 Project Management Plan 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 / Test stage and ensure that inter-project dependencies are identified.

4.4.5 PROJECT STAGE GATE 5 – END OF CUTOVER AND CLOSE STAGE

As the project comes to a close the Project Manager will notify the Jemena 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.

4.5 SUPPORTING INFORMATION FOR PROJECTS AND EXPENDITURE

The projects require an initial project mandate with approved initial funding to commence the project to be followed by a business and project blueprint before the project is approved for delivery and completion.

The program of work for EDPR 2016 is supported by:

- Past business cases where that project will be replicated as part of the end of life replacement in future years such as the IT Infrastructure Refresh and SOE replacement projects.
- Growth plans provided by the business which have also had input from external consulting specialists in energy demand and demographics.
- The existing business case for the Geospatial Information System project deferred from EDPR 2011 to EDPR 2016.
- Formal studies into the solutions and options available with cost estimates for those projects that are pre business case or have no prior history with Jemena.
- Project profiles that provide a business case style project definition with options analysis and costs model. The project profiles are provided with this EDPR 2016 Asset Management Plan as supporting documentation.
- For items that are incremental capital expenditure such as additional licenses and capacity current cost rates, current purchasing agreements or recent acquisition history are applied.
- Consulting organisations providing advice and data for IT and energy industry trends, metrics and benchmarking.

4.6 PROCUREMENT POLICY AND PROCESS

Jemena's procurement policy underpins the various procurement activities undertaken across the business. Jemena is committed to developing innovative and sound procurement practices in support of its strategic goal to be recognised as a leader of infrastructure management and development services.

The Jemena Procurement Policy document is attached to provide the detailed process, practices and rules for all IT procurement.

5. DETERMINING THE PROGRAM OF WORK

5.1 STRATEGIC PLANNING

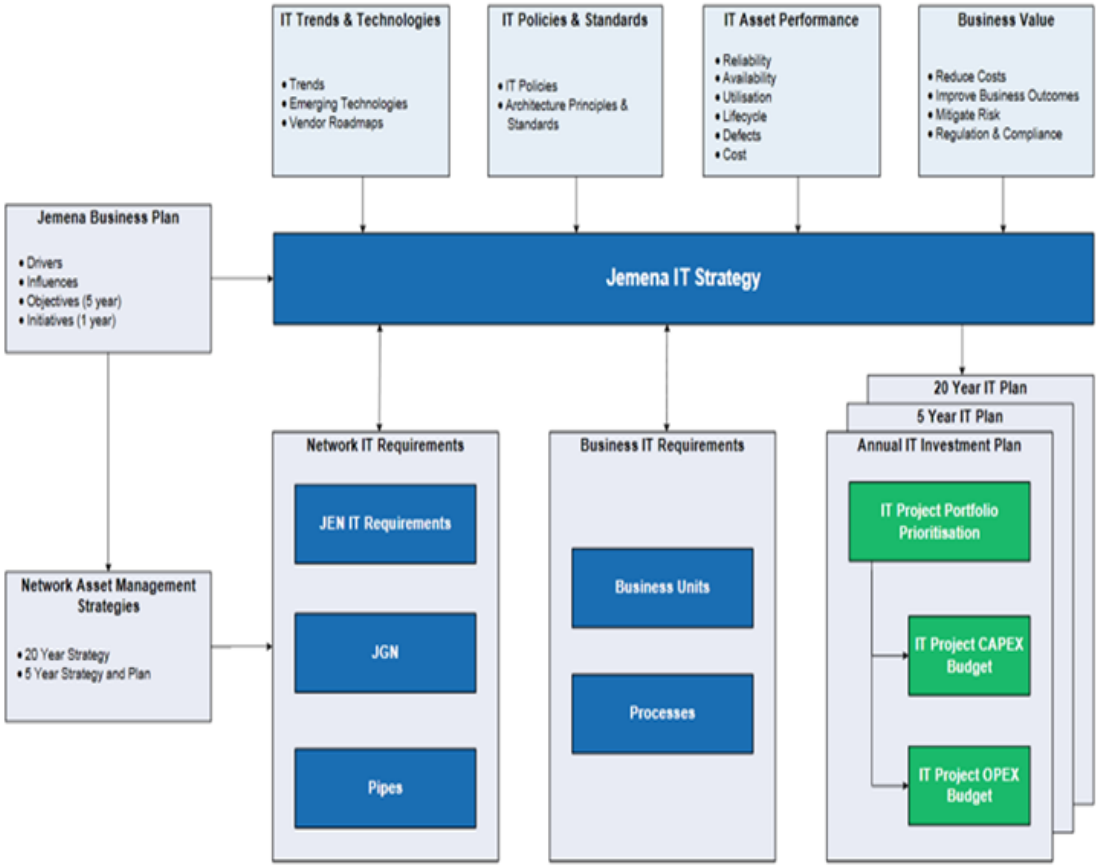
The development of the Asset Management Program of work is directed and guided by the business and IT strategies. The IT Strategy defines the short and long term IT vision and strategy for Jemena, including evaluating industry trends and new technology in the market. The strategy setting process focuses on defining future requirements (at an Enterprise level or for specific business/network areas) and involves aligning the IT vision and strategy with the overall business vision and strategy. The key objectives for implementing the IT Strategy process are:

- Engaging with business and senior management in aligning IT strategic planning with current and future business needs.
- Ensuring the business has an understanding and appreciation of the potential value of IT to the business.
- Aligning all aspects of the IT strategy (such as infrastructure, applications and services) with the business strategy, network asset strategies and annual business plans, regularly re-examined to maintain alignment.
- Understanding the current IT capabilities and asset performance, with a view to what will be required in the future.
- Ensuring the IT strategy is cost effective, appropriate, realistic, achievable, business-focused, balanced, and timely.
- Developing clear and concrete short term goals (which are then to be translated into annual and operational plans) which are derived from and are traceable back to specific long term plans and objectives.

The IT strategy, stakeholders and process is represented in the diagram below. The business units conduct extensive consultations with customers and end consumers on their needs and desires with the results becoming part of the business strategy which in turn informs the IT strategic plan.

The IT strategic planning process is set out in Figure 17 – IT Strategic Program Planning below.

Figure 17 – IT Strategic Program Planning



5.2 PROGRAM OF WORK DEVELOPMENT STEPS

JEN develops an IT Strategy each year with a detailed asset management plan. IT capex and opex budgets are produced each year with 5-year forecast and a 20-year financial outlook.

The approach to the production of the IT Asset Management Plan and Program of Work centres on determining current systems status and known future IT systems needs for JEN that require capital investment and asset management funding in the EDPR 2016 window. The primary steps and decisions that need to be made by JEN and Jemena IT that form the approach to the development of the IT Asset Management Plan are as follows:

- Step 1 Define the energy market economic environment, regulatory compliance requirements for the EDPR 2016 period.
- Step 2 Assess the asset condition and suitability of current IT assets capability to service the energy market.
- Step 3 Define the changes to be made to existing systems to deliver the EDPR 2016 needs and sustain the assets.
- Step 4 Identify new capability requirements to meet market expectations and regulatory compliance.
- Step 5 Provide for growth and/ or changes in customers and market demand.

- Step 6 Determine the prudent investments required to sustain the systems, meet service standards and mitigate risk.
- Step 7 Determine the most efficient and financially effective means of delivery of the IT systems to serve the market.
- Step 8 Define the program of work taking into consideration financial impact on services pricing and capital limitations.

For EDPR submissions and determinations the asset management plan covers in detail the remaining year of the current 5-year EDPR period and the subsequent 5-year EDPR period. There are 6 asset planning and program considerations made in determining the IT Assets and the program of work to be delivered for the EDPR 2016:

1. The increase in IT systems capacity and licenses to meet energy market and services growth.
2. Determining which systems and technologies need to be retired. Retirement dates for systems are predicated by the end of their economic life, unacceptable risk due to the inability to provide adequate vendor or alternative support or that they are no longer suitable for a changing energy market and business.
3. Determining the current IT applications, technologies and systems and services that will be ongoing and the useful or economic life of those assets.
4. Identifying the new systems that are required to:
   - Meet new regulatory obligations.
   - Meet market expectations beyond current capability and standards.
   - Support Jemena's business strategy.
1. Defining the options for current and new systems provision with cost benefits studies. This requires a consideration of the new and proven technologies not currently used by JEN that can improve service efficiency, deliver costs efficiencies, improved market services and lower risks.
2. Developing plans to extend the usage of current IT assets to:
   - Remediate an asset's performance where it is working at less than optimal performance.
   - Avoid or mitigate risk.
   - Change existing assets to align with market changes and the business environment.

5.3 CURRENT ASSETS CONDITION AND SUSTAINABILITY ASSESSMENT

IT assets do not tend to deteriorate in terms of physical condition apart from mobile technologies such as hand held devices, mobile phones and the few assets exposed to the elements. The major assessment is based on the asset's ability to be economically efficient, meet performance standards with growth and ability to meet changing business needs. The IT asset's condition is 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.

- Ability of the products to be maintained and supported by the vendors and the supply of skilled market resources in terms of availability and economic cost.
- Economic condition in terms of cost to operate changes in terms of increasing maintenance costs as the system ages and compared to replacement or alternatives.
- The number and severity of defects requiring remediation.
- Frequency of defects occurring.
- Number of service calls relating to operational problems.
- Current ability to meet ongoing business working environment and changes causing it to be obsolete or made redundant.
- Physical condition including damage and natural wear and tear.

5.4 IT ASSET UPGRADES

Jemena upgrades software applications to new versions of the product on a rolling 3, 4 and 5-year basis depending on the vendors upgrade cycle and the need to upgrade.

Jemena does not allow market sourced products to go out of vendor support unless the vendor goes out of business or the product has no viable replacement. In exceptional circumstances, Jemena will support the product by in-house means or a third party agreement for some legacy systems.

The upgrade plan keeps systems current by upgrading to the current version but no older than current version minus 2. The plan to upgrade a system must still be supported by a business case and risk assessment to support the investment based upon:

- Risk mitigation reasons to rectify software flaws and ensure continuity of vendor support.
- Meeting new regulation provided by changes to the software made available in the upgrade version.
- Gaining access to new functionality and features to be applied by JEN.
- Cost avoidance where not upgrading increases maintenance and support costs.
- Technical necessity to be compatible with a total systems solution.

Competing investment priorities mean that not all systems due for upgrade can take place due to financial and technical constraints and the time available. Therefore upgrade priorities are determined by the level of risk.

5.5 IT ASSET LIFE BY TECHNOLOGY TYPE

Jemena has produced for each software system solution and/or its technology components a plan from 2012/13 through to their end of life, replacement or continuity of the capability to one year beyond the end of the EDPR 2016. In the 6-year time frame all IT Infrastructure is replaced, except for communications. Communications are replaced by the outsourced communications service provider as new technologies are deployed for Australia more generally.

The most common reasons for replacing an IT asset are:

- It is no longer economic to keep an asset compared to replacing it with a new one because maintenance costs will increase once it is deemed to be an aged asset for vendor support purposes.

- The vendor no longer supports the product because it is too old to maintain the product with resources that have become scarce making it an unacceptable risk to all parties.
- It is more cost effective to replace an asset with a new technology.
- The asset can no longer expand or extend to meet business growth and usage demand.
- The asset can no longer be upgraded to allow new systems developments to take place that need to be coupled with newer technologies such as hardware and environments.

All asset replacements are still subject to a business case that includes options analysis, cost benefit justification and risk assessments. The asset replacement forecasts based on IT industry trends and Jemena history backed by business cases are based on the following asset lifecycles.

5.5.1 SOFTWARE APPLICATIONS STANDARD ASSET LIFE

• Office systems	5 years
• Records/document management systems	7 Years
• Geospatial Information Systems	8-10 years
• SCADA	12 Years
• Distribution Management Systems	12 Years
• Metering systems	8-10 Years depending on the specific technologies
• Enterprise Resource Planning Systems (SAP)	12 years

5.5.2 IT INFRASTRUCTURE STANDARD ASSET LIFE

• Desktop, Laptop & Tablets	3 Years
• Mobility Devices	3 Years
• Data Storage	4 Years
• Processing	5 Years
• Telecommunications	Planned as required

Jemena does not own the communications networks. However, project capex is required for replacement technologies resulting from the retirement of the State Government analogue radio network and possible moves to the NBN network.

5.6 ASSET MAINTENANCE AND SUPPORT

The asset maintenance agreements with vendors are based on the following cost rates:

- For mission critical assets requiring 24 hour by 7 days per week vendor support maintenance agreements are 20%-25% of the software license cost depending on the vendor.
- For business hours vendor standard support maintenance agreements are 20% and for 24 x 7 is 25% of the software license per annum.

- For IT Infrastructure technologies maintenance agreements are based on 20% of the original purchase price depending on the technology.
- In some instances such as Microsoft an annual licensing and maintenance agreement fee is negotiated and paid in advance every 3 years.
- By applying market competition pressure, maintenance agreements wherever possible are based on a percentage of the original licenses cost plus Australian CPI or Cost of Living Adjustment (COLA). Unless formally agreed in the licensing sale agreement software vendors reserve the right to use list price as the basis of annual maintenance agreements. This is applied infrequently due to market and relationship pressures when costs increase greater than CPI increments.
- A decrease in the value of the Australian dollar can cause maintenance agreements to increase above CPI, as most technologies are sourced overseas.

5.7 SYSTEMS GROWTH

The growth in systems, usage and costs is determined by the following metrics:

- The growth in customers in terms of IT demand is determined by the number of customer connections. The growth that increases the use of IT results from:
  - Natural population growth creating new customers and housing developments.
  - New customer business growth.
  - Demand for electricity.
  - Energy usage data collection and reporting.
- The extension of existing systems usage within the business to meet increased compliance needs and gain more efficiencies.
- The addition of new systems that will have ongoing growth needs including licensing, support and data storage.
- The ability to take advantage of economies of scale with staff and therefore user numbers typically growing at a slower rate than the network, customer connections and energy demand.
- The growth in data and therefore data storage needs as more information is required, collected, stored and made possible by newer information and data intensive technologies. The higher data storage volume systems include geospatial systems, asset imaging, business intelligence and increasing compliance records for energy and non-energy functions.
- Demand for IT Infrastructure capacity increases at a greater rate than business growth. However, the benefits of new technologies and economies of scale mean the overall IT cost increases at a slower rate than business growth.
- IT data and infrastructure capacity demands for the addition of new systems solutions and the greater use of existing systems as they penetrate further into the business.

JEN has forecast the following demand and growth through to 2020 with consulting advice from ACIL Tasman consulting services.

For the EDPR 2016 period JEN has applied the following growth metrics:

- Customer and customer connection software licenses – 1.2% average over 5 years.

Software licenses for distribution and metering is based on the number of connections.

- Number of users growth = (Business growth 1.2% – Productivity gain of 0.5%) equals 0.7%.

Most corporate and enterprise software licensing is based on separate rates for the number of primary users and end users. Some user licenses have a lower cost read-only license.

The productivity gain is due to economies of scale benefits.

- Data collection and retention based on 2013 actual growth for existing systems – 15%.
- IT Infrastructure = (Business Growth 1.2% – New Technology Improvements 0.5%) equals 0.7%.

As infrastructure is retired the new replacement technologies typically provide greater processing or throughput for the equivalent amount of capital investment. With data storage planned for replacement on a 4-year cycle this means a 0.7% gain per annum.

5.8 NEW SYSTEMS ADDITIONS AND INCREASED CAPACITY NEEDS

Capacity and capital investment planning takes into account the addition of new systems capability. The following new and additional systems are planned to be added to the current IT asset base for the EDPR 2016 period:

- Security Technologies
- AMI meter contestability
- A Customer Relationship Management System
- Field mobility technologies

Greater capacity or usage needs for the following current and/or replacement systems have also been planned within the EDPR 2016 period.

- SAP consolidation and extension
- Document and records management data
- Outage and Distribution management
- Geospatial Information System
- Business intelligence data
- Regulatory reporting
- Social media
- Contestable meters

6. IT CAPEX COSTS PLANNING AND FORECASTING METHODOLOGY

6.1 IT CAPEX COSTING AND FORECASTING

The cost methods and metrics applied to cost the program of work are:

- Business cases for projects and investments that are already in progress at the beginning of the EDPR 2016 period.
- Solution options and project studies with cost estimates conducted by Jemena and with external advisory organisations for pre business case projects.
- Systems upgrades are calculated at 10% of the original project cost for the more recently implemented solutions. For legacy systems and in-house developed systems the costs of an upgrade has been calculated by the project teams work days and daily rate per for each system or technology.
- Extend, remediate and change provisions are based on 3% per annum of the most recent project cost to implement the solution. For legacy systems this type of expenditure is calculated by the number of full time equivalent staff members or contractors required times the daily rate based on the recent historical trend in demand and actual expenditure per system.
- The growth factors are based on the following cost drivers and metrics:
  - For customers and connections, software and technical licensing is a one to one relationship. For the EDPR 2016 period customers and connections are forecast to growth by an average of 1.2% even though energy consumption demand is forecast to fall.
  - The number of internal users is the most common mechanism used by software application vendors for charging for licenses. The EDPR 2016 asset management plan assumes that user growth will be 0.7% average for the 5-year period. Therefore the productivity gain is reflected in our forecasts in a lower per unit cost.

6.2 IT OPERATIONS COSTS PLANNING AND FORECASTING

The AER is applying a base year cost + trend costs + step changes as defined under the regulatory definition of eligible step changes incurred that are in essence caused by a change in regulation or external circumstances beyond JEN's control.

6.3 PROJECT STAFF AND CONTRACTOR COSTS

Operating staff costs are based on the 2013/14 actual baseline costs.

The capital projects costs are based on 2 average costs per day, excluding overheads, reflecting:

- Highly specialised projects based on solutions such as SAP, Geospatial Information Systems, Business Intelligence, Market Systems and Infrastructure projects are costed at an average daily rate per project team of [c-i-c] per day.
- More widely and commonly used and less complex software applications such as Microsoft based systems development, office systems, records management and document management. These projects are costed at an average project team cost of [c-i-c] per day.

- The daily rates are a mix of in-house employees at a total cost of employment calculation + external contract and services company staff.
- Jemena's ratio of internal to external, contract staff depends on the nature of the project with a [c-i-c] [c-i-c] ratio on complex applications where specialised skills are required. These are generally also the projects where the higher rate is incurred. The ratio of internal to external staff comes down to [c-i-c] [c-i-c] on more standardised and recurrent projects such as infrastructure upgrades, client device updates, etc.

6.4 IT SHARED SERVICES COST ALLOCATIONS

Jemena Electricity Network's systems are a mix of dedicated electricity solutions and shared enterprise wide systems used by multiple assets with the Jemena group.

The cost allocations for systems shared by the Jemena group of businesses are based on the following principles and calculations:

- Operational Costs:
  - Direct costing for all systems and technologies only used by that business.
  - Direct costing for systems, technologies and services that are attributable for staff members who only work on the one specific business.
  - Service agreements backed by time sheets for shared staff working on operational services including maintenance and support.
  - Indirect costs such as maintenance agreements, external services not labour based and consumable items are allocated according to a cost model based on a combination of usage metrics and the business benefiting from the systems.
  - The cost allocation model where costs are not directly attributable includes measurement and metrics for:
    - Customer connections and meters where licensing based maintenance is based on those metrics.
    - Numbers of full time equivalent staff allocated per Jemena business.
    - Number of direct users where licensing based maintenance and work effort reflects the numbers of users.
    - Number of desktop and laptop computers.
    - Number of devices.
    - The number and range of systems applications used by each system and their weighted average costs to operate, maintain and support, based on a very large, large, medium and small classification.
    - Data storage capacity.
- Capital Costs:
    - Project costs are allocated on a case by case based using a combination of usage metrics and which businesses in the Jemena group benefit from the project and solutions delivered.

- Cost rates and time sheets are provided by internal and external staff and tracked against plans and budgets.

- Incremental costs for capital items purchased that are not projects, such as systems licenses and more data storage capacity are allocated according to the percentages in the table below.

Enterprise solutions and IT Infrastructure is shared across the Jemena group of energy business as shown in Table 6 – EDPR 2016 Cost Allocation below.

Table 6 – EDPR 2016 Cost Allocation

Jemena IT Cost Allocations 2014
[c-i-c]

The IT operating cost allocation percentages shown in the table are determined annually reflecting changes in IT usage by each of the Jemena energy assets. For the financial year 2013/14 the costing model was redeveloped with the assistance of Oakton Consulting.

The IT Infrastructure cost allocations above were calculated for the recent Data Centres and IT Infrastructure Refresh Project and business case conducted in 2012/13 and 2013/14.

7. 2016-20 CAPITAL INVESTMENT

7.1 OVERVIEW

Table 1 – IT Capital Expenditure by Category (executive summary, above) details JEN's investment plans for the period 2016 to 2020. The investments are costed in real $2015.

Table 7 – IT Capital Investment by Expenditure Category, below, details the split by category.

Table 7 – IT Capital Investment by Expenditure Category

Summary By Category	Internal Labour	External Labour/ Services	Software Licences	Hardware	Projects' Acc'n & Expenses
Category: Regulatory & Market Services Systems					
Category: Corporate & Office Systems					
Category: Finance & Accounting					
Category: Human Resources, Safety & Incident Management					
Category: SAP Lifecycle Management					
Category: Customer Systems					
Category: Outage Management (OMS) + Distribution Management (DMS) + Emergency Management					
Category: Business Intelligence, Reporting & Data Warehouse Systems					
Category: Document, Records & Content Management Systems					
Category: Geospatial Systems & Mapping & Asset Imaging					
Category: Asset Construction & Field Services Systems					
Category: IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement)					
Category: Metering - Standard Control Systems Metering					
Category: Metering - Ongoing Advanced Metering for Contestability					
JEN IT Total					

[c-i-c]

The key elements determining the level of IT capex expenditure for the EDPR 2016 period are:

- The capital investment for deferred projects from EDPR 2011 included:
  - Field Mobility
  - A Distribution Management System
- Enhanced real-time RIN reporting requirements set by the AER.
- Contestability of meters from January 2016.
- B2B Customer relationship management tools to enable Jemena to interact with large customer businesses via the web.
- Ongoing provision for RIN data collection and reporting as the electricity market changes and the AER requirements continue to evolve over time.
- Introduce, develop and Implement additional data warehouse capability to provide greater analytical and decision making support as well as become more efficient in the management of data and information.
- Introduce, acquire and develop new mobility capability to become more efficient with improved services by having the provision of information and systems in the field and for all staff members wherever they need to work.
- Provision for growth in customers, connections and the scale of the distribution network to meet demand and respond to growth in the use of electricity.
- Provision for systems extensions, the optimising of systems performance and respond to change as the energy market and business environment constantly changes and evolves.

- The funding required for asset lifecycle management to upgrade systems and replace end of life systems.

Jemena's investments for recurrent expenditure represent 72% of total expenditure which includes market growth, ongoing change, upgrades and systems replacements. New capability represents 28% of total investments to bring Jemena up to the IT capabilities of Australian energy distribution companies by 2020. The current and non-recurrent profile is consistent with Australian and international capital investments required to sustain current capability while progressing market services with efficient new technologies.

Major projects represent some 59% of total investments. The remaining 41% consists of smaller upgrade projects, growth and changes to existing systems. Approximately [c-i-c] of investments was deferred from the EDPR 2011 period, as a result of reprioritisation of the capital expenditure program.

The major investments have a balance of upgrading systems and the introduction of new capability consisting of, field mobility and enhanced data warehouse and reporting solution and meter contestability in 2016. This brings Jemena up to the level of solutions and technologies in place at most of our contemporary Australian energy distribution businesses.

7.2 MAJOR PROJECTS AND CAPITAL EXPENDITURE

The major IT projects and incremental capital investments for extensions, upgrades and growth planned for the next EDPR period are a mix of:

- Sustaining the ongoing asset base through upgrades, optimising asset performance and providing for energy market growth.
- Implementing projects deferred from the EDPR 2011.
- Replacing systems that have come to the end of their useful or economic life.
- Retiring end of life systems and technologies that have gradually become redundant as new systems replace their business and technical purpose.
- Adding new systems and technologies to bring JEN up to the capability level of Australian energy distribution businesses. JEN currently has gaps in IT solutions and technology capabilities when benchmarked against comparable and best practice Australian and international energy distributors in the areas of Field Mobility including GIS linkages, Business Intelligence and Analytics.

The major projects with material value of more than $1M in capital expenditures are outlined in the following paragraphs.

- **Desktop/Laptop Standard Operating Environment Replacement**: Desktop and laptop computers are planned for replacement on a rolling cycle once they have been used for 3 years. The replacement is driven by the economic business case of replacement compared to maintenance cost increases and compatibility of retention and will include the movement to tablet and mobility options for part of the replacement program to meet field data and performance objectives.
- **Customer Relationship Management**: The AER has issued new guidelines for the management and interaction with customers that require new information, service engagement obligations and tracking along with analysis and reporting. To meet the new obligations JEN will introduce new IT capabilities including the SAP Customer Relationship Management system, customer portal and extend current customer contact functionality.
- **OMS/DMS Integration with SCADA**: The OMS and DMS were intended to be separate systems based on market solutions available during the EDPR 2011 period. The current era of systems providing Outage Management and Distribution Management functionality are intrinsically linked to the SCADA and Real Time Systems for the source of the data and for network control.

Business Intelligence and Analytics

- In the EDPR 2011 period, JEN implemented the advance metering systems and capability including the collection of large scale interval data to give JEN a new base for planning, analysis, decision making, and information for customers informed choice and consumption management. JEN plans to leverage the data and information collected by putting in place new and extended BI solutions using SAP Business Objects as the analytics platform for JEN, coupled with a new SAP DW. This will be the major enabling solution for decision making across the JEN business and will drive further opportunities to expand into data analytics and predictive analysis. The project will move Jemena towards the development of an enterprise capability consistent across all regulated assets.
- Data Warehouse Project: The data warehouse project provides replacement and new capability using the SAP business data warehouse product. The data warehouse coupled with the business intelligence tools provide by SAP Business Objects products will be the:
  - Primary source of data across the JEN business combing and matching data across multiple application systems and data repositories into the one place. The data warehouse becomes the most authoritative source of information with consistency of dates of effect, translation of meaning and manages information by the most efficient means.
  - Major enabling solution for decision making in most parts of JEN for corporate, financial management, meter data, network modelling, predictive analysis, and analytics including data mining.

JEN will maintain relative performance to Australian energy distributors and support improved services, improved risk management and achieve efficiencies by continuing to apply contemporary analytics capability and methods.

- **Archiving:** The project to archive data and decommission obsolete tools, including MS Excel and Access databases, is a major project in the consolidation of systems.
- **Geospatial Systems Upgrade:** The upgrade of the GIS is a major project due to the complexity of the software applications, the scale of the data, the progression in functionality, the increased level of integration with SAP ERP and Field Mobility solutions and the extent of regression testing required. The major upgrades are limited to every 4 years due to the magnitude of the projects. Smaller releases are implemented every 2 years as an operational cost.
- **Field Mobility**: The Field mobility solution builds on the works delivery capability provided by the SAP Electricity system and the Geospatial Information Systems. The project delivers information into the field using laptops and tablets via wireless communications including trucks as hot spots and downloaded information. The usage is applied to asset management including construction, maintenance, emergency management, materials management, asset remediation and replacements.
- **Regulatory changes**: Regulatory change is a constant for JEN with allowances made for further change as the AER refines the demand for operational and comparative data.
- **IT Infrastructure - Asset Lifecycle Projects**: IT Infrastructure consists of a large collection of hardware, communications links and technical operating software. A significant percentage of the IT Infrastructure investments are small scale and incremental purchases. Therefore this capital investment consists of bundles of capital works to form projects and many item purchases not requiring a project.
- **Data Storage**: Data storage is planned to be replaced at the end of 4 to 5 years subject to business case when the cost of technical upgrades and increased maintenance agreements becomes uneconomic compared to replacement. Typically advances in technology means replacement technologies are more powerful and provide greater volume of storage per dollar than current data storage.
- **Provision for Growth**: Funds are required to provide additional software licenses and infrastructure capacity for market growth for new customers, additional connections as well as cumulative retention of information, records and data for compliance and/or ongoing usage.

- **Provision to Extend Remediate and Change**: The funding is required to extend the use of current systems, ensure optimal performance and change systems as the market and economic environment constantly changes.
- **AMI Meter Contestability**: AMI meters become contestable from January 2016. Changes will need to be made to systems to meet obligations for contestability as and when the AEMC completes the rewrite of market rules including Chapters 2, 5, 7 & 8 to define the rules ahead of procedure development in collaboration with AEMO and market participants.

Table 8 – IT Capital Expenditure by Major Investments, below, lists the 11 major projects and the aggregate cost of smaller scale projects. The smaller scale projects and costs include incremental capital acquisitions for increased capacity.

Table 8 – IT Capital Expenditure by Major Investments

Major Projects		Direct Escalated Costs					
Project ID	Project Name	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
28	Desktop Tools Lifecycle Management - Replacement	[c-i-c]					
82	SAP Lifecycle Management - Technical Improvements Provision						
102	Customer Relationship Management Project						
128	Outage Management Systems Replacement & Distribution Management Project						
136	Outage & Phase Identification Project & Tools						
158	Business Intelligence Project - Stage 2						
166	Data Warehouse - Replacement						
186	Document and Records - Archiving and Decommissioning Project						
198	Geospatial Information Systems - Upgrade						
246	SAP Works Management - Change Provision						
262	Field Mobility Project - Stage 2 Inspections and Works Management						
264	Field Mobility Project - Stage 3 Implementation & Completion						
272	Field Mobility Project - Communications & Truck Hot Spots						
302	Software Application Upgrade - NMS (SCS)						
306	Software Application Upgrade & Merge the 2 SAP Systems						
320	Software Application Upgrade - NMS (ACS)						
Sub Total		**$3,719,398**	**$10,008,611**	**$8,821,488**	**$7,833,002**	**$5,795,225**	**$36,177,723**
IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement)		$5,486,978	$7,212,198	$8,011,936	$3,301,856	$2,942,948	**$26,955,915**
Total Major Investments		**$9,206,376**	**$17,220,809**	**$16,833,423**	**$11,134,858**	**$8,738,173**	**$63,133,638**
All Other Investments		$12,153,981	$5,757,535	$5,445,665	$7,310,083	$10,008,876	**$40,676,140**
Total IT Program of Work		**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**

7.3 CAPITAL EXPENDITURE BY INVESTMENT TYPE

Table 9 – Capital Investment by Investment Type, below, summarises the investments in IT application solutions and IT Infrastructure by investment type. The table demonstrates that new capability represents 28% of all IT capex and 72% represents lifecycle investments to sustain and replace current capability.

Growth at 2% reflects the natural growth in the business in response to the market, increased take up of systems, data growth and the additional growth that will be required for new systems.

The 17% provision for extensions, remediation and changes to existing systems largely reflects JEN leveraging the newer investments in existing systems, such as the SAP capability, applying unused functionality without the need to invest in new licenses. This investment type also includes the cost of adapting to the continuous change in the external business environment and market as well as continuous improvements and remediation.

Replacements represent 19% of all IT capex as JEN completes the replacement of legacy systems and of IT Infrastructure which is largely replaced within any one 5-year period.

Table 9 – Capital Investment by Investment Type represents the capital investment types relative to software solutions and It infrastructure and as a share of overall IT capex.

Table 9 – Capital Investment by Investment Type

Category	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total	% Share
New Capability	$9,126,215	$4,179,612	$2,513,837	$2,552,022	$2,453,997	**$20,825,682**	20%
Systems Replacement & Retirement	$4,923,233	$10,940,197	$13,679,271	$7,667,032	$1,960,751	**$39,170,483**	38%
IT Asset Upgrade	$3,158,666	$3,618,147	$1,574,075	$3,653,616	$9,483,809	**$21,488,312**	21%
Extend, Remediate & Change	$3,770,941	$3,809,088	$3,880,458	$4,059,298	$4,340,416	**$19,860,200**	19%
Growth	$381,302	$431,301	$631,449	$512,972	$508,077	**$2,465,100**	2%
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**	**100%**

Table 10 – Capital Investment by Replacement verses Extension of current applications and as a share of overall IT capex.

Table 10 – Capital Investment by Replacement verses Extension

Replacement vs. Extension	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total	% Share
Replacement	$4,923,233	$10,940,197	$13,679,271	$7,667,032	$1,960,751	**$39,170,483**	38%
Extension	$16,437,124	$12,038,147	$8,599,818	$10,777,908	$16,786,298	**$64,639,295**	62%
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**	**100%**

Table 11 – Capital Investment by Recurrent verses Non Recurrent expenditure and as a share of overall IT capex.

Table 11 – Capital Investment by Recurrent verses Non Recurrent

Recurrent vs. Non-Recurrent	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total	% Share
End User Devices (Recurrent)	$1,651,764	$1,547,878	$1,053,431	$2,454,661	$496,261	**$7,203,995**	7%
Recurrent	$10,582,377	$17,250,854	$18,711,821	$13,438,258	$15,796,792	**$75,780,101**	73%
Non-Recurrent	$9,126,215	$4,179,612	$2,513,837	$2,552,022	$2,453,997	**$20,825,682**	20%
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**	**100%**

Table 12 – Capital Investment by Mandatory, Prudent and Beneficial expenditure and as a share of overall IT capex.

Table 12 – Capital Investment by Mandatory, Prudent and Beneficial

Mandatory, Prudent or Beneficial	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total	% Share
Mandatory	$5,481,742	$2,482,316	$1,844,598	$2,383,549	$1,793,161	**$13,985,365**	13%
Prudent	$14,757,939	$20,432,842	$19,670,540	$13,817,174	$13,921,053	**$82,599,549**	80%
Beneficial	$1,120,676	$63,185	$763,951	$2,244,217	$3,032,834	**$7,224,864**	7%
Total	**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**	**100%**

7.4 CAPITAL EXPENDITURE BY COST CATEGORY

Internal and external labour is largely driven by supply and demand factors influence by the changes in demographics, immigration and retirement of the workforce. Software and hardware are also heavily influenced by supply and demand with the value of the Australian dollar also influencing these largely imported products.

External services costs for IT are primarily influenced by the demand and supply for staff to work on legacy systems or the most recent technologies. Over time, aging systems become harder to service or develop as those skills diminish in the market due to retirement or people moving on to careers with newer technologies. The more rapid take-up of new technologies creates an excess of demand over supply until such time as the market can develop the skills and resource levels required. Legacy systems are retired as a service risk exceeds acceptable manageable levels and replaced with new proven technologies that can be supported at a reasonable cost with sufficient numbers of skilled resources are available, thus reducing exposure to higher market rate fluctuations.

7.5 CAPITAL EXPENDITURE 20-YEAR FORECAST 2016 TO 2035

JEN can forecast an IT plan with a high degree of confidence out to 2020 due to 75-80% of expenditure based on sustaining the current asset base and providing for energy market growth. The remaining 20 to 25% of costs is invested to meet regulation compliance, changing market needs and introducing new solution and technologies proven in the market place.

However, predicting and forecasting new IT Technologies to be introduced to JEN and how systems are to be provided beyond 2020 is not possible with any degree of confidence. This point is demonstrated by the rapid emergence of new mobility technologies such as smart phones and tablets with their many apps and “cloud based services” as has occurred during the EDPR 2011 period. Therefore from 2021 onwards to 2035 the plan is to follow the lifecycle management principles set out in Section 1.1 that defines how IT assets are to be sustained and when then they are to be replaced. The replacement solutions and technologies are not nominated but assumed for the purposed of the 20 year plan to be a similar investment and maintenance cost as the most recent replacement of the solution or technology with allowances for CPI increases.

Table 13 – IT CAPEX 20-Year View, below, shows a relatively constant investment in IT systems over 20 years based on the current asset base and plan to 2020. This reflects the program of work for EDPR 2016 achieving comprehensive systems capability and maturity. The 20-year outlook implies IT capex as a percentage of overall JEN capex will reduce as the business grows the network, customers and connections.

Table 13 – IT CAPEX 20-Year View

Summary By Category	EDPR 2016	EDPR 2021	EDPR 2026	EDPR 2031
Category: Regulatory & Market Services Systems		[c-i-c]		
Category: Corporate & Office Systems				
Category: Finance & Accounting				
Category: Human Resources, Safety & Incident Management				
Category: SAP Lifecycle Management				
Category: Customer Systems				
Category: Outage Management (OMS) + Distribution Management				
Category: Business Intelligence, Reporting & Data Warehouse				
Category: Document, Records & Content Management Systems				
Category: Geospatial Systems & Mapping & Asset Imaging				
Category: Asset Construction & Field Services Systems				
Category: IT Infrastructure (Lifecycle Upgrades, Replacement &				
Category: Metering - Standard Control Systems Metering				
Category: Metering - Ongoing Advanced Metering for Contestability				
Total				

20 Year IT CAPEX																			
CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024	CY 2025	CY 2026	CY 2027	CY 2028	CY 2029	CY 2030	CY 2031	CY 2032	CY 2033	CY 2034	CY 2035
[c-i-c]																			

8. EDPR 2011 ASSET MANAGEMENT PROGRAM, DELIVERY AND COMPLETION

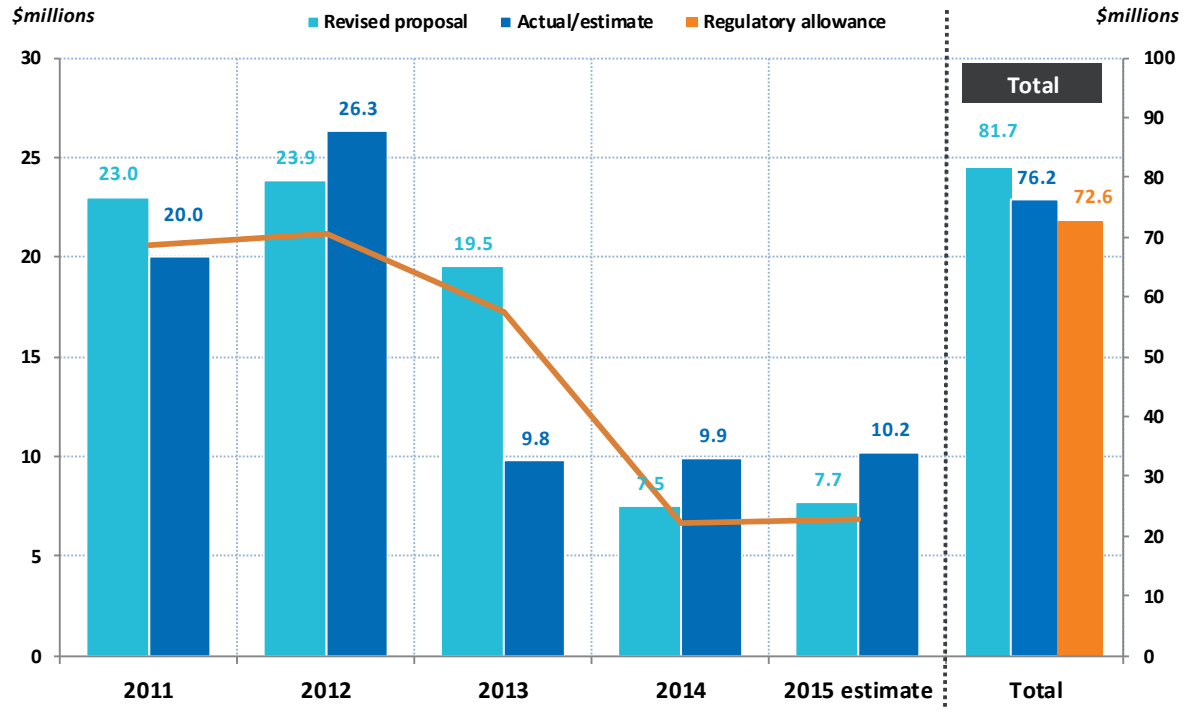
8.1 OVERVIEW

JEN will largely deliver the EDPR 2011 IT Program of Work committed. Actual plus Forecast capex is projected at $76.2M compared to an allowance of $72.6M, a variance of $3.6M or 5%.

Table 14 – EDPR 2011 CAPEX Comparison to Allowances ($2015, $M)

	2011	2012	2013	2014	2015 estimate	Total	Variance to actual/ forecast
Revised proposal	23.0	23.9	19.5	7.5	7.7	81.7	5.5
Regulatory allowance (incl. Merits review outcomes)	20.6	21.2	17.3	6.7	6.9	72.6	-3.6
Actual/estimate	20.0	26.3	9.8	9.9	10.2	76.2	-
Actual/forecast less regulatory allowance	-0.6	5.1	-7.5	3.2	3.4	3.6	

Figure 18 – Actual to Forecast Capital Spend for EDPR 2011



8.2 PROGRAM DELIVERY STATUS 2011 TO 2014

From the commencement of the EDPR 2011 period in 2011 to October 2014 JEN has undertaken and completed the following major projects:

- Replaced the legacy SAP systems more than 12-years old that provided capability for enterprise management, asset management as well as financial management and accounting.
- Retired legacy systems applications as a result of the SAP program including SAP and non-SAP applications.
- Developed and commissioned the AMI advanced meter systems based on SAP IS-U/Itron IEE MDM and Silver Spring UIQ, NMS, which was subject to separate allowances but a major part of the overall JEN program of work.
- Complied with AMI and National Energy Customer Framework market and regulatory obligations as well as met non energy regulation obligations and changes.
- Relocated from the legacy data centres infrastructure platforms and services that had reached end of life due to constraints on expansion. The transition was completed in 2012/13 into 2 outsourced data centres.
- Replaced the core IT Infrastructure including a back log of end of life systems with new technologies to be more efficient and more cost effective.
- Replaced the desktop and laptop standard operating environments as well as the Microsoft Office application solutions.
- Conducted a number of systems consolidations, replacements and retirements enabled by new technologies, cloud based software as a service and the new capability introduced by the above project.

8.3 PLANNED ASSET MANAGEMENT PROGRAM COMPLETION IN 2015

The IT capex plan for 2015 provides $10M of budget for IT projects which are consistent with the completion of the EDPR 2011 asset management plan submission, determination and capex allowances:

- Implement Stage 1 of a 3 stage longer term business intelligence, analytics and data warehouse program from 2015 to 2018.
- Implemented the first of the new Cloud Computing based services using the SAP solutions recently made available in their Australian based data centres.
- Increased JEN's defences against a long term increase in security risks and threats maliciously aimed at damaging, disabling and shutting down energy networks. This includes implementing a new Security Information and Event Management system capability along with a 24 x 7 security alert monitoring service. This investment is a necessary initiative and major investment beyond what was planned at the time of the JEN EDPR 2011 determination.
- SAP Financial Management – Provides for continuous change to financial management, accounting and reporting as the market and business environment constantly changes.
- SiteSafe Incident management system upgrade.
- Records and document management development to meet obligations.
- Retirement of legacy meters (type 4, manually read type 5 + 6 and type 7 metered and unmetered) remaining from the rollout of AMI meters.
- Piloting new mobility technologies and applications solutions that work with JEN existing applications.

- Lifecycle growth and replacement projects for IT Infrastructure will take place for:
  - Data storage
  - Infrastructure services
  - Platforms and processing
  - End user services
  - Organic growth as the market and business grows

8.4 DEFERRED PROJECTS

The following projects and investments were deferred by JEN until JEN EDPR 2016:

- The Distribution Management System
- Field Mobility System and associated Business Process Re-engineering Project

The Distribution Management System implementation was deferred as a result of the end of systems sharing with United Energy Distribution making the original solution and project cost unviable. JEN decided to defer the project until the EDPR 2016 period and conduct the project together with the Outage Management System upgrade/replacement as a more efficient and cost effective approach. Concurrently, the systems vendors have been converging OMS/DMS solutions into an integrated product further supporting a delay in project timing.

The original Field Mobility and Business Process Re-engineering project was defined in 2010 for the EDPR 2011 using laptop technologies, communications available at the time and systems applications that were not built for a mobile and field based workforce. In a few short years following the EDPR 2011 determination the information systems industry entered a new era of smart internet and new communications based mobility technologies that has revolutionised the way the public uses technology and business is conducted. These rapidly deployed technologies and their take up by both consumers and businesses has changed the efficiency opportunities and expectations of energy customers, consumers and JENs workforce along with our ability to manage and respond to emergencies and the need for information anywhere anytime.

The new information technology era is also characterised by a rapid take-up of new smart and mobile technologies accompanied by new mobility software applications by both new vendors as well as existing vendors extending their products with additional mobility solution capability. JEN's core solutions systems vendors (primarily SAP, Microsoft and GE respectively) have released new mobility application products that work with the existing core application solutions that JEN has implemented.

New vendors and services companies are offering mobility solutions using "Cloud Computing" based services on an agreed service level or flexible usage level, including on demand, that has now matured to become viable and financially effective for JEN's needs.

None of these technologies existed in 2010 and cloud computing services were in their infancy in Australia and were considered too immature to be included in the JEN EDPR 2011 submission and determination. JEN has therefore decided to carefully re-define mobility strategies and plans as well as the program for work for the EDPR 2011. The mobility program has not stopped but has been slowed down and pushed back to ensure all of the research, planning and pilot projects can be undertaken to make the right technology and process change decisions, with the most suitable investment levels for the energy market. The range of solutions and investment costs are substantial due to the technology choices, methods of service delivery and the possibilities for service improvement. This new era of technologies and opportunities requires in depth examination, proof of concept and a pilot projects for a prudent, efficient and cost effective result.

Table 15 – JEN 2015 IT CAPEX Plan sets out the projects and capex cost plans for 2015 which completes the EDPR 2011 Period. The plan is consistent with the EDPR 2011 Asset Management Plan and determination.

Table 15 – JEN 2015 IT CAPEX Plan

2015 IT Projects			
Project Name	**Project Description**	**Recurrent or Non-Recurrent**	**CY 2015**
End user computing	Laptop and desktop replacements Tablet equipment for Corporate & Field Mobility trials Desktop software updates New hardware associated with office move	Recurrent	[c-i-c]
Recurrent IT Projects	Updates and maintenance on application systems & infrastructure	Recurrent	
Non-Recurrent IT Projects	Replacement and new systems	Non-Recurrent	
Total			**$10,230,769**

9. EDPR 2016 IT PROGRAM BY PROJECT CATEGORY

9.1 OVERVIEW

In the following section the asset management plan provides a profile and listing of the IT Investment projects by business category. The categories represent the business purpose. By nature, the applications cover large parts of the business. Therefore, the same application solutions are involved in some projects multiple times and in more than one business category, such as the SAP core system.

SAP corporate and financial solution and the SAP electricity solutions are at the core of most of the JEN program. IT Infrastructure in terms of processing, data storage and communications apply to most projects. Jemena's consolidation of applications and infrastructure means:

- Larger scale and fewer solutions.
- Less integration development.
- Fewer processing and data storage devices.

Consolidation results in:

- Lower systems build costs and implementation costs.
- Lower work effort and cost to maintain systems.
- Cost advantages of economies of scale.

Capital projects are numbered for reference and tracking by Jemena Budget sections and used in this document for cross referencing to the IT capex Plans and Models. This includes the 2015 budget and plans from 2016 out to 2035. Projects that do not occur during the 6-year asset management plan are omitted and so are projects already completed in 2013/14, therefore there are gaps in the project numbering sequence.

For each system, application or suite of systems, provision has been made, where applicable, for recurrent projects and capex for:

- New capability implemented for the first time.
- Ongoing development, extended usage and change as the working environment changes.
- Growth in licenses, staff and capacity as the business and distribution network grows.
- Systems upgrades.
- Systems replacements and retirements.

The IT program of work 2014-2020 can be summarised to represent the following four themes:

- Delivering new capabilities to the business that are aligned to market trends and changing industry focus.
- Improving existing capabilities to minimise risk and drive efficiencies.
- Enabling business transformation as a key to delivering the business plan.
- Responding to business needs in terms of implementing capabilities and enabling solutions that drive regulatory and other priorities.

The initiatives within the above four themes aim to deliver the following outcomes to Jemena business:

- New opportunities and operational / process efficiencies.
- Centricity of information/data.
- Advanced analytical capabilities leading to better decision making.
- Reliable infrastructure, systems and environment that is up-to-date, secure and efficient.
- Provision for growth and continuous change as the regulatory and business environment changes.

The IT program of work capex for EDPR 2016 by business category is summarised in Table 1 – IT Capital Expenditure by Category (Executive Summary, above) and detailed in Appendix A.

9.2 BUSINESS AND IT NEEDS

JEN's IT program of work is determined by the following business and economic environment for the energy industry and IT industry.

- **Regulatory Environment and Change**: The regulated Australian energy market and industry continues to change, evolve and diversify with the AER consistently responding with new and refined regulation to change circumstances to:
  - Ensure the market operates as intended.
  - Put into effect the policies of Federal and State Governments.

JEN must conform to new and changed regulation change to meet its market obligations and to stay in business as a regulatory compliant organisation. Enabling regulatory compliance in most cases requires new or changed systems capability.

- **Customer Expectations**: JEN's customers directly and indirectly consist of the retailers, end consumer and energy transmission business that provide energy to the Australian market. The customer expectations evolve over time and need to be met in terms of:
  - Defined services standards, determined by regulation.
  - Customer engagement and customer expectation satisfaction.
- **Sustainability and Risk Management**: The IT asset management plan must provide sustainable solutions that are:
  - Low risk.
  - 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, cease to be relevant or are no longer economic to operate compared to alternatives. The asset management plan provides for all systems and technologies to be manageable at low risk or be replaced.

- **Network and Demand Growth**: The Victorian economy and population continues to grow the network and customers while energy consumption, the demand for electricity, has started to flatten. JEN is also impacted by major corporate energy consumers closing, becoming more efficient or relocating outside Victoria. The IT asset management plan provides for a combination of natural growth, network growth and peak energy consumption where applicable in terms of:
  - Transaction volumes and data capacity.

- Licenses for additional users.
- New connection points.
- The introduction of new systems.

- Cost Drivers and Affordability: Information technologies are sensitive to price changes that fluctuate according to the:
  - Relative value of the Australian dollar.
  - Market position of vendors and competition.
  - Age of current systems.
  - Cost of skilled resources based on supply and demand.

- Opportunities Presented by New Technologies: IT continues to introduce new technologies and solutions that have:
  - High adoption rates in Australia.
  - Proven to be robust.
  - Supported in relatively short time frames, often well within JEN's 6-year asset management plan time frames.

Relevant proven technologies include mobility solutions, smart phones, tablets and the provision of services and data via cloud computing, for example cloud infrastructure and Software as a Service (SaaS). These technologies and services have been considered and continue to be considered for the 6-year plan but only those with relevant priority have been included as strategies.

9.3 NEW CAPABILITIES

The IT plan aims to deliver the following major or key new capabilities over the IT strategy period:

- **Field Mobility**: This major initiative enables delivery of information into the field using laptops and tablets via wireless communications including trucks as hot spots.
- **Outage and distribution managements**: Consolidate the technologies to enhance the operational capability to manage the network.
- **AMI Contestable Meters**: Deploy systems changes to meet the contestability obligations for AMI meters from 2016.
- **Data warehousing and Analytics**: Implement SAP BI as the analytics platform for Jemena coupled with extended SAP business data warehouse. This will be the major enabling solution for decision making across the business and will drive further opportunities to expand into data analytics and predictive analysis.
- **Drawings Management**: Implement a new drawings management system.
- **Customer**: Deliver SAP based Customer Relationship Management solution.
- **Market**: Deliver capabilities to manage market power of choice initiatives and market data management.
- **Asset Management**: SAP Portfolio management for consolidating projects, managing and accounting for large programs of work.

- **Employee Management**: Enhance SAP HCM and SAP Learning Management solutions with self service capabilities as the platform for employee information, skills and training management.
- **Governance and Risk**: Deliver SAP based Governance and Risk Management capabilities.
- **Infrastructure and other**:
  - Enable mobility, virtualisation infrastructure and infrastructure to manage and control mobile devices from a security, privacy and risk perspective.
  - Identity and access management infrastructure and implement a SIEM tool (Security Information and Event Management).
  - Infrastructure automation capabilities.

9.4 SIMPLIFY JEN OPERATIONS ENABLED BY INFORMATION TECHNOLOGY

Jemena has committed to becoming a process centric focused organisation. This, from an IT systems perspective, means that all business processes are mapped to the IT services that support them. The benefits of this approach will be recognised via:

- Predictive change modelling with the ability to perform top down and bottom up reviews.
- A single authoritative source of truth and change management for Infrastructure, Architecture, Services, Applications and Business Processes.
- The capture of Intellectual Property maintained in a dedicated ARIS repository.
- Further benefits flowing from change impact assessments, risk analysis, design implications or project delivery dependencies and greater agility during implementation of change with less risk.
- A Technical Reference Model (TRM) to support the infrastructure meta-model for the Enterprise Architecture tool. TRM will describe infrastructure services and functions to be provided along with the current performance standards.

9.5 IMPROVING EXISTING CAPABILITIES

IT assets are constantly monitored for performance to standards and for defects. The assets are also subject to constant change as the business changes. Maintenance contracts are entered into with the vendor and/or developer of the software application and their associated IT infrastructure. If a product can no longer be maintained by a vendor the product is replaced this can occur where a Vendor reaches a point when they will no longer support a product that has aged or JEN has not consistently upgraded the product to stay reasonable current and applied corrections to known problems. The IT plan includes a number of planned lifecycle upgrades to technology assets over the strategy period. These included upgrades and maintenance of the following key systems:

- **SAP**: As a recently replaced product, SAP is in good condition and requires low levels of maintenance. As the most strategic, powerful and complex solution over the next 7 years SAP requires continuous management of the SAP configuration and reporting as the business continuously changes. SAP ECC7, SAP ECC8 and Solution manager will be upgraded to later versions the 2016 to 2020 EDPR period along with other SAP related module upgrades.
- **Microsoft Office**: Microsoft has very low maintenance requirements typically as a well-established solution within Jemena and as a robust commodity product. In-house support is provided focused mainly on operation problems arising from set up, changing users, new users and changes to the associated IT Infrastructure platforms.

- **The Jemena Web-Site, Customer Portal and Internet**: These undergo continual content change and development requiring IT capitalised and incremental opex services per annum depending on the works scale and cost levels. A refresh of the capability and assets is planned for every 3 years and done as a business and technical upgrade. This approach means large scale replacements are not required instead underlying products and components are progressively replaced.
- **Infrastructure**: The consolidation of the IT Infrastructure, adoption of cloud based services and replacement with newer and fewer technologies means the intended lifecycle becomes more achievable and cost efficient over time. The replacement of legacy systems, virtualisation and reduction in systems are all simplifying the asset management, maintenance and support. The current strategy is to have all IT infrastructure assets managed according to their standard lifecycle without a backlog by 2017.

The IT Capital projects detailed in Appendix A provide a comprehensive asset management plan that encompasses:

- New capability to be implemented.
- Ongoing investment in existing systems including increased take up by the business and optimising efficiencies.
- Provision for continuous change as the regulatory and business environment changes.
- Provision for natural economic growth, network growth and customer growth.
- Upgrades to systems to manage risk and performance.
- Replacement and retirements of end of life systems.

JEN will continue to improve BAU process to support regulatory and delivery forecasts, building on the major achievements enabled by replacement and new IT systems.

Infrastructure and applications will continue to be managed through a well-defined and updated Infrastructure Roadmap, Lifecycle Management Framework and business unit cost allocations.

Jemena requires reliable and timely forecasting and planning for IT infrastructure spend to ensure accurate and traceable regulatory submissions. The infrastructure roadmap will be reviewed and updated on an annual basis to underpin this assertion. The creation and implementation of a Lifecycle Management Framework allows for clear understanding of upcoming infrastructure capital allocation for regulatory submissions.

In the following sub-sections the IT capital program of work by business category is detailed describing each project as well as incremental work and acquisitions required to sustain the current systems and provided for growth.

9.6 REGULATORY AND MARKET SERVICE SYSTEMS

The regulatory and market systems detailed in Appendix A, encompass information systems, functions and facilities required to:

- Comply with AER regulation and rules.
- Provide the services and integration for the energy market to operate via AEMO.
- Comply with all non-energy Federal and State Government regulation.

9.6.1 ASSET CONDITION

The assessment of asset condition, for the purposes of IT systems, is defined as:

- Being fit for purpose.
- Being economically efficient.
- Being technically current with low incidence and risk of failure.
- Having low levels of systems outage.
- Meeting performance standards.

9.6.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan - Change

The following regulatory capital projects are planned to be inflight during 2015.

- **Energy Regulation and Market Operation** **Projects 10, 12 & 20**

  Provision is made for regulation and market operations changes, based on historical spend experience, for any new requirements that may emerge between 2016 and 2020.

  Provision is made for ongoing development and modification as circumstances change for:

  - Project 10 & 12 – Regulatory Reporting.
  - Project 20 – Non-energy regulation changes.

- **RIN Reporting** **Project 14**

  The RIN Reporting investments is an ongoing annual provision for changes to reporting required by the AER for all RIN related data, information and reports.

- **Energy Market Services** **Project 16**

  JEN provides a range of software functionality to support market operations and integrate with AEMO systems. AEMO has flagged the need to replace their ageing systems in the foreseeable future and to continue to evolve the market services. The strategies, projects and initiatives including AEMO replacement systems are not yet defined. Therefore a provision based on recent trends has been made in this AMP until more specific needs become known.

Provision is made for changes and development of AEMO's systems and the integration with Jemena.

- **Customer Engagement Provision** **Project 18**

  A capital provision for the anticipated investment required to meet the ongoing changes to customer rules and obligations.

- **Non-Energy Regulation Change** **Project 20**

  This investment makes provision for changes to regulations that are not energy related for all levels of Government that require systems support to change. The provisions exclude Finance, Tax, Environment and OHS which are provided in the relevant categories for those ongoing needs.

- **New Pricing Structures, Methods & Reporting** **Project 22**

  Develop pricing structure, methods and systems to comply with new power of choice regulations, options and market requirements, including capacity and demand pricing.

Maintenance Plan

The IT assets are constantly monitored for performance to standards and for defects. The assets are also subject to constant change as the business changes. Maintenance contracts are entered into with the vendor and/or developer of the software application and their associated IT infrastructure. If a product can no longer be maintained by a vendor the product is replaced or alternative support arrangements are sourced. Vendors will inevitably reach a point when they will no longer support a product that has aged or where the organisation has not consistently upgraded the product to stay reasonably current and applied corrections to known problems.

The maintenance status for each of the regulatory systems is:

- **SAP**: The product has first line support and configuration change maintained in-house with the software application maintained by the vendor SAP.
- **AEMO Integration**: The software is developed, maintained, changed and supported in-house by Jemena.

A summary of capex is provided in Appendix A - Regulation and Market Systems.

9.7 CORPORATE AND OFFICE SYSTEMS

The corporate and office systems detailed in Appendix A, encompass the corporate and back office functions of JEN. The enterprise systems cover IT solutions used by the entire business including office systems, intranet and general reference information. The functions supported by the corporate and enterprise systems are:

- Executive and General Management
- Operational portal
- Office administration and productivity tools
- Internet and Intranet
- Corporate Communications

- Mobility tools

The assets used to service the above functions are a combination of the following IT assets and their associated IT Infrastructure.

- **SAP Portal**: The application to enable staff to access SAP based capabilities for transaction, control and reporting responsibilities.
- **Microsoft Solutions**: A range of Microsoft office applications are used for planning, administration and the more general document production including spread sheets, design tools and presentation information.
- **Tablets and other tools:** The tools are to support the move to greater individual mobility to connect and interface to corporate systems on an "anywhere any time" basis and are to be procured during the EDPR period.

9.7.1 ASSET CONDITION

- **SAP Portal:** The SAP portal is the entry mechanism for all Jemena staff and external parties who need to access the SAP systems, data or functionality to complete their work tasks. Significant new and changed functionality will be deployed in SAP (PPM, CRM, HR, Safety and Incident Management) through the EDPR period such that an upgrade of the portal is planned to support the increased functionality.
- **Microsoft Office Solutions**: The Microsoft assets are current version as at 2014 and in good condition and performing to standard.

9.7.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan – New Assets and Capability

- **Corporate Mobility** **Projects 36, 38 & 40**

The objective of the corporate mobility projects is to provide personnel with technologies that ensure they have access to up to date information regardless of location. For corporate this involves, Human Resource requests, timesheets, email, safety information, purchase requisitions and approvals. The mobility projects solutions include changes made necessary by business change, growth and upgrades to the current applications reflected by change to operational processes by the user base.

Capital Plan – Current Systems Assets

- **Office Systems** **Projects 24-34**

Jemena has no major projects planned for the Microsoft corporate application until replacement in 5 years planned for 2019. Replacement is more likely to be driven by the business demand for proven new technologies rather than risk, asset condition or economic reasons. Those technologies include mobility solutions, tablets, touch screens and "smart applications" creating new software applications and a new SOE. Note that there are plans for a Microsoft based content, records and document management application described in that asset class in a following subsection.

Capital projects for the office solutions will include changes made necessary by business change, growth and upgrades to remediate problems or enhance the current suite. Replacements for some application tools are expected within the Microsoft SOE.

The Jemena web-site, internet and intranet systems facilities for non-customer development are included in Office systems with provision for ongoing development, change and growth.

The SAP portal will be enhanced and upgraded in line with the implementation of new SAP functionality described in later sections and standard upgrade cycles.

Maintenance Plan

- SAP requires a significant level of skills and competencies to support the scale, complexity and mission critical importance of the SAP suite of assets. First line support for SAP is currently being provided by JIT.

  As a recently replaced product SAP is in good condition and requires low levels of maintenance. SAP is a strategic, powerful and highly complex ERP solution that will be used over the next 7 years. By nature, it requires continuous management of the SAP configuration and reporting as the business continuously changes. Small scale changes that are incremental and low cost are not capitalised.

- Microsoft has very low maintenance requirements typically as a well-established solution within Jemena and as a robust commodity product. In-house support is provided focused mainly on operation problems arising from set up, changing users, new users and changes to the associated IT Infrastructure platforms.

A summary of capex is provided in Appendix A – Corporate and Enterprise Systems.

9.8 FINANCE AND ACCOUNTING

The finance and accounting systems projects detailed in Appendix A, encompass the functions used by the entire business including accounting, credit management, capital and asset accounting, treasury management, Business plans, governance, risk and compliance, and labour and cost allocation models and general reference information. The functions supported by the systems are:

- Executive and General Management
- Governance and Risk Management
- Financial Management and Accounting
- Procurement
- Credit management
- Treasury

The assets used to serve the above functions are a combination of the following IT assets and their associated IT Infrastructure.

- **SAP ERP System**: The software solution is the strategic application for the functions of Finance and Accounting, Human Resources, Payroll, OHS and general corporate operations reporting.
- **Allocation models:** The labour model is used by Jemena to allocate corporate functions to the operational businesses, while the corporate allocation model allocates corporate capital and operational expenditure across the Jemena business.
- **Quantum**: This software application is the primary product, in conjunction with financial accounting SAP systems and MS Excel spread sheets, used for Treasury purposes.

9.8.1 ASSET CONDITION

- **SAP ERP System**: The SAP solution was implemented as a very large project from 2011 to 2013 as a complete replacement of the preceding SAP solution, which had passed end of life. The solution is therefore current and in robust condition with an expected life of at least 12 years out to 2024. The solution is continually being developed, configured and adapted to the business.
- **Quantum**: The Quantum software application is performing well and meets current needs with no development plans in the foreseeable future. It is routinely upgraded on a 5-year cycle.

9.8.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan – New Assets and Capability

- **SAP Business Planning and Consolidation** **Projects 48**

  The business has an ongoing requirement to deliver timely and accurate financial, management and regulatory reporting across all Jemena business units. To deliver the level of automation, quality and timeliness of the data JEN proposes to introduce new capabilities to the business by extending the SAP platform to include business planning and consolidation processes.

Capital Plan – Current Systems Assets

- **SAP** **Projects 42-56**

  Jemena will implement the following SAP based change initiatives in the EDPR 2016 period.

  - **Extend, Remediate and Change.** The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.
    - **Project 44:** Governance, Risk and Compliance – Deploy interface fixes between AMI SAP and JSAP.
    - **Project 50:** Accounting – Ongoing changes to support market changes.
    - **Project 52:** Credit Management – SAP capacity to automate AR Dunning (Dunning is the process of methodically communicating with customers to ensure the collection of accounts receivable).
    - **Project 54:** Capital and Asset Accounting – Balance sheet reconciliation tool.
    - Standardised BI reporting for fixed assets and intercompany balancing reports.
    - **Project 56:** Treasury Management – Interface the Quantum treasury system to SAP.
    - **Project 42:** Lifecycle and Growth standard upgrades to the SAP modules (Risk and Compliance) is planned for the EDPR period based on Jemena's standard upgrade cycle.

Capital Plan – Capability Automation

- **Labour Model** **Project 60**

  Jemena will extend the footprint and overall usage of SAP to drive more efficiency, remediate problem areas and avoid custom development by automating the labour model using SAP BI.

- **Quantum**

  There are no current capital projects planned for the Treasury solution beyond upgrades and change capital expenditure. Replacement is not planned at present and will be guided by the plans of the vendor.

Maintenance Plan

- SAP requires a significant level of skills and competencies to support the scale, complexity and mission critical importance of the SAP suite of assets. First line support for SAP is currently being provided by JIT.

  As a recently replaced product, SAP is in good condition and requires low levels of maintenance. SAP is a strategic, powerful and highly complex ERP solution that will be used over the next 7 years. By nature, it requires continuous management of the SAP configuration and reporting as the business continuously changes. Small scale changes that are incremental and low cost are not capitalised.

- Quantum support and maintenance is provided by the vendor who is managed by Jemena.

A table of capex is provided in Appendix A – Finance and Accounting.

9.9 HUMAN RESOURCES, SAFETY AND INCIDENT MANAGEMENT

The Human Resource systems projects detailed in Appendix A, encompass human resource, safety and incident management functions of JEN. The enterprise systems cover IT solutions used by the entire business. The functions supported by the human resource systems are:

- Human capital management
- Managed Self Service
- Learning management
- Environment Health and Safety
- Incident management
- Payroll

The assets used to service the above functions are a combination of the following IT assets and their associated IT Infrastructure.

- **SAP System**: The software solution is the strategic application for human resource functions including modules for Human capital management, learning, payroll, OHS and incident management.

9.9.1 ASSET CONDITION

- **SAP System**: The SAP solution was implemented as a very large project from 2011 to 2013 as a complete replacement of the preceding SAP solution which had passed end of life. The solution is therefore current and in robust condition with an expected life of at least 12 years out to 2024. The solution is continually being developed, configured and adapted to the business.

9.9.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan – New Assets and Capability

- **Human Capital** **Project 64**

  Human capital management is maintained through six different systems plus different portals, multiple vendors, support arrangements and licence agreements (Talent Link, Red Carpet, ET Web, and SAP) to enable recruitment, on boarding, remuneration performance management through to departure.

  The current systems lead to manual reporting across multiple systems and a lack of 'end to end' management of staff with a manual link of each system to the SAP ERP. The project will consolidate each of these disparate systems onto a single integrated SAP platform to enable a fully integrated end to end 'Hire to Retire' set of business processes with integrated analytics.

- **Managed Self Service** **Project 68**

  JEN has deployed SAP ESS (employee self-service) which enables the online creation of timesheet, leave requests and other personnel data but does not enable management approval workflows or analytics. The deployment of the SAP MMS module for managed self-service will enable the expansion of capabilities to provide management workflow and analytics.

- **Learning Systems** **Project 72**

  Jemena's current learning suite includes the RMS and SALT applications which are standalone solutions that do not deliver a full suite of learning management capabilities nor integrate to performance management systems. JEN intend to deploy the SAP Leaning Management Solution to integrate the learning processes with management and development of JEN's human capital.

Capital Plan –Deployed System Assets

- **SAP** **Projects 66, 70 & 74-80**

  Jemena will implement the following SAP based change initiatives in the EDPR 2016 period.

  - **Extend, Remediate and Change.** The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

    Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

    The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

    Upgrade plans projects include:

    - **Project 76:** Upgrade to Human Capital Management application.
    - **Project 78:** Upgrade to Payroll application.

    Change projects include:

- **Project 66: Changes to Human Capital Management application.**
- **Project 70: Changes to Managed Self Service application.**
- **Project 74: Changes to Learning Management application.**
- **Project 80: Changes to the EH&S SAP module.**

Maintenance Plan

- SAP requires a significant level of skills and competencies to support the scale, complexity and mission critical importance of the SAP suite of assets. First line support for SAP is currently being provided by JIT.

  As a recently replaced product, SAP is in good condition and requires low levels of maintenance. SAP is a strategic, powerful and highly complex ERP solution that will be used over the next 7 years. By nature, it requires continuous management of the SAP configuration and reporting as the business continuously changes. Small scale changes that are incremental and low cost are not capitalised.

A summary of capex is provided in Appendix A – Human Resources, Safety and Incident Management.

9.10 SAP LIFECYCLE MANAGEMENT

The SAP lifecycle projects detailed in Appendix A, encompass SAP ERP system and associated modules used by the entire business. The functions supported within the corporate environment are:

- Procurement and logistics
- Works and Asset management
- Customer Management
- Resource management
- Operations analytics

The SAP Lifecycle Management category specifically excludes finance and accounting and human resources which have been described in earlier sections and form part of the integrated SAP ERP system.

The assets used to service the above functions are:

- **SAP ERP System**: The software solution is the strategic application for the functions of Finance and Accounting, Human Resources, Payroll, OHS and general corporate operations reporting.

9.10.1 ASSET CONDITION

- **SAP ERP System**: The SAP solution was implemented as a very large project from 2011 to 2013 as a complete replacement of the preceding SAP solution which had passed end of life. The solution is therefore current and in robust condition with an expected life of at least 12 years out to 2024. The solution is continually being developed, configured and adapted to the business.

9.10.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan – New Capability

- **Data Volume** **Project 84**

  Data is growing at a rate of 43% per annum within the JSAP ECC6 Environment. SAP business warehouse data is growing at a rate of 128% per annum. This results in the following:

  - Longer backup, restore, upgrade, and administration times.
  - Extended runtimes for overnight batch jobs.
  - Longer times to replicate SAP databases.
  - Increased hardware costs.

  JEN will deploy SAP DVM encompassing Application Lifecycle Management (ALM) and Information Life Cycle (ILM)) to provide assessment, implementation, operation and continuous improvement of data management, capacity management and archiving.

- **Archiving Management** **Project 86**

  JEN will implement SAP data archive solution to limit performance degradation due to the size and growth of the database tables and log and audit files.

Capital Plan – Current Systems Assets

- **SAP** **Projects 82 & 88-96**

  Jemena will implement the following SAP based new initiatives and technical improvements over the EDPR Period. The planned projects are:

  - **Extend, Remediate and Change**

    The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

    Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

    The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

  - **Project 92 – Enhancement Pack 8.** This upgrade project recurs every 2-3 years and consists of the vendor, SAP, providing functional and technical upgrades to the product solution.
  - **Project 94 – Solution Manager Upgrade.** This project recurs every 3 years and consists of enhancements to enable improved proactive technical and business process monitoring of the SAP solution.
  - **Projects 82 & 96 – Remediation and Technical Improvements.** The scale and complexity of the SAP solutions means Jemena will continue to invest in optimising the use and operational efficiency of the modules including the enabling of improved business processes.
  - **Project 88 – Retirement of the legacy SAP System.** To be shut down with the deployment of the SAP Archiving and Data management projects which enable availability of past information and transactions.
  - **Projects 90 –** Growth in user licenses consistent with growth in JEN's business operations.

Maintenance Plan

- SAP requires a significant level of skills and competencies to support the scale, complexity and mission critical importance of the SAP suite of assets. First line support for SAP is currently being provided by JIT.
- As a recently replaced product SAP is in good condition and requires low levels of maintenance. SAP is a strategic, powerful and highly complex ERP solution that will be used over the next 7 years. By nature, it requires continuous management of the SAP configuration and reporting as the business continuously changes. Small scale changes that are incremental and low cost are not capitalised.

A summary of capex is provided in Appendix A – SAP Lifecycle Management.

9.11 CUSTOMER SYSTEMS

The Customer Systems projects detailed in Appendix A, encompass functionality used by the business to support:

- System based customer relationship management
- Customer engagement solutions
- Customer safety through Dial Before you Dig

The assets used to service the above functions are:

- **Customer Relationship Management**

  Jen currently uses a combination of manual processes and information support from multiple systems to meet market based customer relationship management obligations. JEN seeks to consolidate processes and systems to manage, control, track and support all interactions with customers.

- **Jemena Web Site, Call Centre Technology and Social Media Tools**

  A combination of IT facilities provides customer access to information and issue resolution via the web. These include call centre and social media for transactions, outage notifications, emergency information and Jemena service information.

- **Dial Before You Dig**

  DigSafe Pro is the current application supporting the dial before you dig functionality for JEN.

9.11.1 ASSET CONDITION

Customer relationship management is managed without a single view of the customer requiring manual interventions and information exchange. As obligations increase the continued use of the current system is resulting in declining customer service and increasing cost to serve customer requirements. The applications in use have not been designed to provide a customer experience; rather they provide point information relating to a customer's interaction with JEN.

The Jemena web site, customer portal and Internet based services to the market are kept constantly up to date and therefore in prime condition. The use of all Internet enabling technologies will experience increased demand with new customer regulation and growth in the use of web-enabled facilities driven by a population that is now increasingly Internet and technology dependent.

Dig Safe Pro: is a single purpose solution that is no longer supported in the current version and is planned for replacement.

9.11.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan – New Assets and Capability

- **Customer Relationship Management System (CRM)** **Project 102**

  New capability for customer relationship management will be implemented using the SAP CRM module. This solution is to be delivered through a cloud based SaaS facility and deployment.

Capital Plan – Current Systems Assets

- **Call Centre IVR** **Project 116**

  System replacements are planned to achieve significant improvements in quality of service integrated to SAP as the single user interface, to improve call management including caller identification, call routing on business data, screen pre-population, staff status management.

  JEN plans to deploy a full-featured solution for managing customer voice contacts with all the benefits of the converged IP telephony architecture integrated to Interactive Voice Response (IVR) services fully integrated to SAP CRM.

- **Dial Before You Dig (DBYD)** **Project 108**

  The project is required to replace the legacy current DBYD solution. The legacy solution has reached end of life, requires replacement and is struggling to cope with increased demands and volume of inquiries on a daily basis.

- **Extend, Remediate and Change** **Projects 104, 106,110–114, 118, 120 & 124**

The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

- **Projects 104 & 112 – Change.** These projects enable the CRM and Dial Before you Dig applications to be modified to ensure the solutions meet both market and customer expectations.
- **Project 110 – Upgrade**. An upgrade for and Dial Before you Dig is planned to occur every 3 years and consists of enhancements to the applications for functionality, version management and security.
- **Project 106, 114 & 124. Growth.** Planned growth in licenses for CRM and Dial Before you Dig users consistent with growth in JEN's business operations, as a provision to add more user licences as the business grows in response to customer growth.

- **Project 118 & 120. Social Media and Customer Claims Tracking.** The project involves the continued development of customer claims tracking, web and social media as a result of the evolving way customers are seeking to interact with the business and the increased use of data technologies as the first point of business contact.

Maintenance Plan

SAP CRM

- SAP requires a significant level of skills and competencies to support the scale, complexity and mission critical importance of the SAP suite of assets. First line support for SAP is currently being provided by JIT.

  As a recently replaced product SAP is in good condition and requires low levels of maintenance. SAP is a strategic, powerful and highly complex ERP solution that will be used over the next 7 years. By nature, it requires continuous management of the SAP configuration and reporting as the business continuously changes. Small scale changes that are incremental and low cost are not capitalised.

Dial Before you Dig

The solution is a point solution and will be managed within the application portfolio as per JEN's policies for change, upgrade and replacement and be supported by the vendor.

IVR Application

The IVR is to be integrated to SAP and the Outage Management System and will be supported under established vendor arrangements.

Customer tracking and Social Media

The applications will be functionally managed internally to a planned change process supported by application upgrade and replacement cycles consistent with Jemena policy.

A summary of capex is provided in Appendix A – Customer Systems.

9.12 OUTAGE MANAGEMENT, DISTRIBUTION MANAGEMENT AND EMERGENCY MANAGEMENT

The projects under this category are detailed in Appendix A – OMS and DMS. The distribution network systems for the purposes of this asset class are those systems that manage the network as a physical asset and to distribute electricity. The systems manage the electricity from the point of advice by the retailer to provide the service, to receiving the energy from the transmission businesses and through to the end consumer. The systems assets in this class are:

- Outage Management - Current IT systems that manages the disruption or failure of the network to supply electricity.
- Distribution Management - New capability that improved the routing and load management of electricity through the network.
- Integrity Management Tool - New and replacement technology that monitors the networks condition and ability to distribute electricity.
- Operational Technologies (OT) - Outage and Phase Identification Tools.

- New and replacement technologies to monitor, track and predict outages.
- Demand and Emergency Load Management - Increased capability leveraging advanced metering data to improve the matching and management of demand and supply.
- Emergency load management is the controlled reduction of energy load to minimise harm to consumer businesses.
- Relay Equipment Setting Information System (RESIS) to an existing system.
- Emergency Management - Improved IT systems support for emergencies enabled by new mobility, intelligence and communications technologies.

9.12.1 ASSET CONDITION

The Outage Management System will reach its end of life during the EDPR 2016 period.

To sustain the system to the necessary performance standards, ongoing investment in upgrades and replacement are required to sustain the capability to meet the services and performance obligations as well as mitigate risks to an acceptable level.

The current emergency management systems assets are in good condition. However, the frequency and severity of emergencies and the availability of the new technologies in the field improve the response and recovery capability to help contain the impact and damage to end consumers, the market, energy assets and JEN's operations including costs.

9.12.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Outage Management and Distribution Management** **Projects 126-132**

Outage management and distribution management are now provided in software solutions market as a combined product.

The outage management component of the system manages the tracking and alerts from the time energy distribution is disrupted or fails completely, including the integration with customers for providing outage information and communications

The distribution management component of the system manages the routing of electricity supply and distribution throughout the network using combinations of demand, load and outage information. This function is currently performed using SCADA systems without the advantages of the distribution management systems functionality.

The distribution management system capability was deferred from the EDPR 2011 period due to no longer sharing systems with United Energy Distribution making the plan to implement not financially viable. The systems market now provides integrated suites of outage management and distribution systems coupled with SCADA solutions providing the capability to implement a fully integrated set of network control systems.

The current outage management system is expected to reach its end of its economic, technical and security life in the EDPR 2016 period. At that time JEN will assess the options of using the current vendor's replacement product with the advantages of the preserving current data or move to a new product and vendor based on competitive tender and business case.

- **Integrity Management Tool** **Project 134**

The tool provides new continuous monitoring and testing capability of the network to help anticipate and ensure the network condition will meet the energy demands, supply and distribution.

- **Operational Technologies – Outage and Phase Identification Tools Project 136**

The electricity network uses a range of operational technologies to support energy supply located throughout the network. These devices have typically been stand alone "black boxes" of hardware with fixed software applications that cannot be modified. The outage and phase identification tools are new and replacement technologies that help identify outages or possible outages and the distribution phases throughout the network linked back to central operations.

- **Demand and Emergency Load Management Projects 138 - 142**

The demand and emergency load projects are for standard systems upgrades and provision for change.

The demand management system component includes the management of the consumer demand and load on the network using a combination of forecasts, purchased supply and actual demand.

Emergency load management is the controlled reduction of energy load in parts of the network during and emergency driven need to reduce load interacting with major consumers to not cause harm to their business.

- **Relay Equipment Setting Information System (RESIS) Project 144**

The investment makes for provision for ongoing change to an existing system. As the network increases in scale, extends its geographical footprint and grows, including in-fill growth, the RESIS capability needs to change and extend.

- **Emergency Management Projects 146-152**

Emergency management systems increases the level of capability available to support JEN's emergency response and recovery teams for major emergency events including bushfires, floods, storms and the possibility of malicious events causing major outages through destruction of energy assets. The emergency management projects are:

  - **Project 146**: The project extends the capability of the existing emergency management systems by providing more, data, analytics and situational information to and from the emergency location via mobile devices and communications. The project includes extending the current dashboard information available to emergency controllers and response teams using the additional systems capability consolidated from multiple sources and new systems capability tools such as geospatial systems and information analytics tools for predictive analysis. JEN currently uses the emergency management application system "Whisper" which remains the core product solution along with outage management, works management and asset management applications.
  - **Project 148**: The project investment implements mobile satellite communications that can be used in emergencies when the public communications networks are rendered not operational by catastrophic events or are overloaded by public demand. The projects assumes the limited number of satellites dishes are leased or rented and provided as part of a service by emergency management specialists organisations, such as those used by the State of Victoria Emergency Services. The Satellite dishes are truck mounted and portable giving flexibility depending on the circumstances.

- **Project 150**: The project provides for ongoing change and development as the network changes and the nature of JEN's geographical area changes in respect to hazards, risks, population and demographics. In addition, JEN builds up intelligence information and data over time from emergency events which can be used to improve and continuously focus on the areas of most need, risk and occurrences.
- **Project 152:** The project provides for a standard cyclical upgrade to the current surveying system to stay current, compatible with related technologies and as mitigation for security risks applicable to retaining older technologies.

Maintenance Plan

All of the outage, demand and emergency management products are market-sourced, specialised systems applications and technologies. They have small scale in-house support due to their specialised nature and all have maintenance agreements with the vendors. The outage management systems are upgraded on a 4 year cycle due to their scale and complexity with all other systems in this category upgraded on a 3 year cycle.

A summary of capex is provided in Appendix A – OMS, DMS and Emergency Management.

9.13 BUSINESS INTELLIGENCE, REPORTING AND DATA WAREHOUSE SYSTEMS

The BI, Data Warehouse and Reporting projects detailed in Appendix A, encompass functionality used by the business to support:

- Sourcing, management and provision of data.
- Business analytics.
- Executive and management reporting.

The application assets used to service the above functions are:

- **Business Intelligence and Management reporting**

For business intelligence JEN uses BRIO, Cognos and SAP BI.

- **Data Warehouse**

The applications systems currently used by JEN for the management of content, documents and records are used together and include:

- Microsoft applications:
  - MS Office 2010.
  - OpenText Livelink with ECMS (Electronic Content Management System).
  - SharePoint.

9.13.1 ASSET CONDITION

All Microsoft office applications were refreshed and brought up to date as at 2012 to be in prime condition and fully supported.

The following applications are out at the end of their economic life and planned for replacement:

- BRIO and Cognos

9.13.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Business Intelligence** **Project 158**

JEN plans to supplement business intelligence technologies using SAP Business Objects. The additional new tools will support technology integration with the Data Warehouse project.

- **Data Warehouse** **Project 166**

The data warehouse project introduces new capability using the SAP business data warehouse solution with licenses already owned as part of the SAP licensing agreement. The data warehouse coupled with the business intelligence tools provided by SAP Business Objects products will be the major enabling solution for decision making in most parts of JEN for corporate, financial management, meter data, network modelling, predictive analysis, and analytics including data mining.

- **Extend, Remediate and Change**

The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

- **Project 160 & 168 – Change.** These projects occur continually for the BI and Data Warehouse applications to ensure the solutions meet market obligations and customer expectations.
- **Project 162 & 172 – Upgrade**. The projects for BI and Data Warehouse recur every 3 years and consist of enhancements to the applications for functionality, version management and security.
- **Project 164 & 170 – Growth.** Planned growth in user licenses for BI and Data Warehouse users consistent with growth in JEN's business operations.
- **Project 174 – Management Reporting**. Provision has been made for ongoing development and change of Board, Executive and Enterprise management reporting.

Maintenance Plan

First line support is provided by Jemena and is subsequently provided by the vendors where there are maintenance agreements still offered by the vendor.

Second line support is already provided in-house by Jemena for the SAP business objects product.

In future second line support is anticipated to be provided in-house by JIT.

A summary of capex is provided in Appendix A – Business Intelligence, Reporting and Data Warehouse.

9.14 DOCUMENT, RECORDS AND CONTENT MANAGEMENT SYSTEMS

The Document, Records and Content Management projects detailed in Appendix A, encompass functionality used by the business to support:

- Content management in terms of information sources, taxonomy, currency and redundancy of information.
- Document and Records Management including regulatory and certifications compliance records.
- Organised and structured administration and control of all information, data and records.
- Drawings including management of drawing versions and their provision to end users.

Photographic storage and provision to users.

The application assets used to service the above functions are:

- **Drawing and Photographic applications**

The applications systems currently used by JEN include:

  - Drawbridge
  - PhotoVault

- **Document Management**

The applications systems currently used by JEN for the management of content, documents and records are used together and include:

  - OpenText Livelink with ECMS (Electronic Content Management System)
  - SharePoint

9.14.1 ASSET CONDITION

All current applications are in line for replacement or upgrade in the EDPR 2016 period.

9.14.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Records and Document Management** **Project 176**

JEN plans to replace the SharePoint and OpenText Server applications with new versions as the current versions have reached the end of their economic life.

- **Information Management** **Project 192**

JEN plans to expand the implementation of an Information management system to structure, describe and govern information assets across the entire organisational and technological boundaries, to improve efficiency, promote transparency and enable business insight for all JEN information artefacts.

- **Document Consolidation and Taxonomy** **Project 184**

The taxonomy and document consolidation project introduces new capability to identify:

- What information, documents and records are to be retained?
- How artefacts are labelled and identified (Taxonomy and Metadata).
- The lifecycle for the artefact.
- Which artefacts are to be retired and which supporting systems are to be decommissioned.

- **Document Archiving and Decommissioning** **Project 186**

The archiving and decommissioning project introduces capability to:

- Overcome existing inconsistencies in information and records by holding a single approved version.
- Consolidate information and records including conversion of some older records to new systems formats for transfer from legacy systems.

- **Drawings Management** **Project 188**

The current software application is reaching end of life and needs replacement. In addition Jemena requires an enterprise wide solution for complete business coverage, consistency and efficiency.

- **Photographic Storage Tools** **Project 196**

JEN plans to change the current application to centralise the control and repository for all photographic material to maximise availability and accessibility of material for efficient management of network assets.

- **Extend, Remediate and Change**

The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

- **Project 178 – Change.** This project occurs continually for the records and document management application to ensure the solutions meet market obligations and customer expectations.
- **Project 180 & 190 – Upgrade**. The project for records and document management and drawings management systems recurs every 3 years and consist of enhancements to the applications for functionality, version management and security.
- **Project 182 & 194 – Growth.** Planned growth in user licenses for records, document and information management users consistent with growth in JEN's business operations.

Maintenance Plan

First line support is provided by Jemena and is subsequently provided by the vendors where there are maintenance agreements with the vendor.

In future second line support is anticipated to be provided in-house by JIT.

The drawing and photographic solutions will be supported by the service desk for first line support with second line from within the Jemena division that own the solutions for business purposes supported where appropriate with vendor agreements.

A summary of capex is provided in Appendix A – Document, Records and Content Management.

9.15 GEOSPATIAL SYSTEMS, MAPPING AND ASSET IMAGING

The geospatial asset class encompasses all systems solutions that provide functions, information and data for the following services to assist the JEN divisions and business partners to design, construct and manage energy and to develop, extend, maintain and change distribution assets:

- Current systems for:
  - Geospatial Information.
  - Mapping.
  - Asset imaging and geological imaging.
  - Government geospatial and topographic information.
  - Geographical information relating to the positioning of the current and future distribution network.
  - Integration with asset management systems.
  - Integration with geospatial information sources including entities such as State Government services and Google Maps.
- New systems and capability for:
  - Common Information Model – To bring together information from disparate sources and consolidate into one common information model for reference, multiple system updating and as a single source of reference for geospatial information and data.
  - Network visualisation tools including:
    - High voltage and sub-transmission schematics.
    - Feature manipulation engine tool.
    - Network Viewer.
  - Extending the use of the GIS systems to incorporate underground assets.

JEN currently uses the following systems assets for geospatial purposes:

- The GE Smallworld software application - Geospatial Systems.
- Surveying systems taking information from in-house and external surveying and imaging service providers.
- LIDAR systems for aerial imagery and mapping.
- Computer Aided Design (CAD).

9.15.1 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **The GE Smallworld GIS System - Lifecycle Management** **Projects 198-202**

The projects provide for the investment required to sustain the GIS solution over the 5 year EDPR 2016 period encompassing:

- A major upgrade of the GIS system is proposed for 2017 that introduces significant new functionality and features as well as staying current with new technologies, increasing defence against security beaches that could otherwise increase by being exposed to older product versions.
- Provision for change as the network changes, new and extended geospatial data is required as the network is extended.
- An increase in license costs for one (1) user that will be required as the network and customers grow over the EDPR 2016 period.

- **Common Information Model** **Project 206**

The project brings bring together information from disparate sources and consolidate them into one common information model for reference, analysis, multiple system updating of the same data and as the single source of reference for geospatial information and data.

High Voltage and Sub-Transmission Schematics **Projects 210 – 212**

The project uses the existing geospatial systems to provide in depth schematic diagrams and images of high voltage and sub-transmission assets to improve and support the design, construction, extension and management of those assets.

- **Geospatial Systems Integration for Mobility** **Projects 208 & 214**

The project develops the ability to transfer geospatial data to and from the field using mobility devices; this extends the capability beyond the pre-existing view and read only access planned for deployment in 2015. This includes the collection of data or changes to data and information directly into the GE Smallworld GIS systems and other geospatial solutions. The project will provide collection that is more efficient, automate data transfer, and provide data integrity assurance and sharing across multiple application systems. The enabling solution is the SAP mobility solution and integrator to GE Smallworld.

- **Feature Manipulation Engine Tool** **Project 216**

The project acquires and implements a tool that provides an integrated collection of Spatial ETL tools for data transformation and data translation. The tool is to be used to consolidate information from multiple sources and formats for consistent and common usage across the **JEN geospatial systems.**

- **GIS Integration Tools Design and Drawings** **Project 220**

The project acquires and implements a tool that provides the ability to import the network's geospatial data directly into JEN's design and drawings tools. The process is currently manual or a replication method.

- **GIS Integration for Tools – Upgrade** **Project 222**

The project provides for a standard cyclical upgrade to the current integration tool to stay current, compatible with related technologies and as mitigation for security risks applicable to retaining older technologies.

- **Network Viewer Upgrade** **Project 224**

The project provides for a standard cyclical upgrade to the current network viewer system to stay current, compatible with related technologies and as mitigation for security risks applicable to retaining older technologies.

- **Underground Network Tool Model Tool and GIS Integration** **Project 226**

The project acquires and implements a specialist geospatial tool for underground assets including the energy network and communications assets. The project integrates the new underground assets information, data, diagrams and images with the overall network geospatial information and images to provide a common view as well as separate views.

The project is also planned and timed as pre-cursor to the “dial before you dig” project.

- **Network Analysis Visualisation Project** **Project 228**

The project uses the new information and data provided by each the projects in this category as well as the current systems and new tools to provide a highly detailed view and asset profile of the network. The consolidated view of the entire network and assets in detail provides the basis for analysing the network for planning, performance, growth, capacity and development purposes. This includes “what if” analysis for future development, changes to existing scenarios and impacts for emergency planning.

- **Surveying System Upgrade** **Project 230**

The project provides for a standard cyclical upgrade to the current surveying systems to stay current, compatible with related technologies and as mitigation for security risks applicable to retaining older technologies.

- **LIDAR systems for aerial imagery and mapping** **Project 232**

The investment is a provision for change as the network changes, new and extended aerial data is required as the energy network is extended.

- **Computer Aided Design (CAD)** **Project 234**

The project provides for a standard cyclical upgrade to the current CAD system to stay current, compatible with related technologies and as mitigation for security risks applicable to retaining older technologies.

Maintenance Plan

All of the geospatial products are market sourced specialised systems applications and technologies. They have small scale in-house support due to their specialised nature and all have maintenance agreements with the vendors. The outage management systems are upgraded on a 4 year cycle due to their scale and complexity with all other systems in this category upgraded on a 3 year cycle.

A summary of capex is provided in Appendix A – Geospatial Systems, Mapping and Asset Imaging.

9.16 ASSET CONSTRUCTION AND FIELD SERVICES SYSTEMS

The Asset Construction and Field Services projects detailed in Appendix A encompass functionality used by the business to support:

- Network asset identification location, condition and capacity, for planning and design capabilities.
- Asset inspection tools.
- Environmental management responsibility component of JEN's OHS capabilities.
- Program and project management.
- Mobile management of Human and physical assets.

The application assets used to service the above functions are:

- **Asset Inspection**

  SAP EH&S and Asset Management are the applications currently used by JEN for asset inspection.

- **Environmental Management**

  SiteSafe is the applications currently used by JEN for the management of environmental requirements and due for replacement by SAP EH&S module.

- **Program and project management**

  It is proposed to deploy an online application to replace in-house scheduling and planning tools.

- **Field Mobility**

  Current tools are for limited specialised processes.

9.16.1 ASSET CONDITION

All applications for asset inspection and environmental management are at the end of their economic life with the environment tool no longer able to meet the regulated management and reporting requirements for JEN.

9.16.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Integrated design Tool** **Project 236**

  A tool is proposed to integrate all data sources including SCADA, GIS and SAP WAM to provide a dynamic view of all network assets in their current operational state both above and below ground. The tool will enable a timely and accurate view of network capacity to identify future asset management and development plans.

- **Environment Management Replacement** **Project 242**

  The SiteSafe application has reached the end of its economic life and will be replaced or upgraded. The optimal solution is to further consolidate vendors and move to the SAP EHS&M module, which is also proposed for the Incident Management requirements for JEN. Environment is an element of

EHS&M, this project will manage the rule changes and data transfers to move to the environment element to EHS&M and for JEN to be system compliant with recent rule changes to environmental responsibilities.

- **SAP PPM Deployment** **Project 248**

  Portfolio and Project Management is a new capability which will enable better control of projects across their life cycles. SAP PPM provides a powerful solution that will allow JEN to employ sophisticated project management methodologies that drive speed and quality in project and program outcomes.

- **Mobility** **Projects 262 & 264**

  Field staff are currently restricted in how they carry out their tasks and activities due to the lack of direct access to corporately held information, when located away from business offices.

  These projects include the deployment of tools and hardware to enable full field based functionality for interacting with the corporate knowledge base and scheduling, managing and finalising field activities without the requirement for fixed location information transfer between staff and the business.

- **SAP Project Management Accounting enhancement** **Project 256**

  Enhance the SAP management accounting module to automate the creation of project accounts and collection of project data.

- **Field Mobility – Communications and truck Hot Spots** **Project 272**

  Provide for hotspot WiFi on trucks to relay internet access to mobile devices.

- **Extend, Remediate and Change**

  The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

  Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

  The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

  - **Projects 244, 246, 252, 258 and 266 – Change.** These projects occurs continually for SAP PPM, mobility, environment management, PPM management accounting and SAP works management to ensure the solutions meet market obligations and customer expectations.

  - **Projects 238, 240, 250 and 268 – Upgrade**. The projects for design and asset inspection tools recur every 3 years and consist of enhancements to the applications for functionality, version management and security.

  - **Projects 254 &270 – Growth.** Planned growth in user licenses for PPM and mobility users consistent with growth in JEN's business operations.

Maintenance Plan

- **Environmental Management**

  The SAP asset solutions to be acquired will be maintained under the current arrangements for SAP products as described in previous sections.

- **Integrated Design and Asset Inspection**

  - First line support will be provided by the service desk.
  - Second line support will be provided by the vendors under maintenance and support agreements.

A summary of capex is provided in Appendix A – Asset Construction and Field Services Systems.

9.17 IT INFRASTRUCTURE (LIFECYCLE, UPGRADES, REPLACEMENT AND RETIREMENT)

The IT infrastructure category encompasses all hardware technology platforms, communications, operating environments and data systems needed to operate the application solutions.

In the 6-year asset management lifecycle the entire IT infrastructure, with the exception of communications, is planned to be replaced due to the assets becoming unsupported by vendors, uneconomic to retain or overtaken by newer more efficient technologies.

The majority of the IT infrastructure investments made during the EDPR 2016 period will be involved in lifecycle replacements of the platforms with some upgrades.

Infrastructure Capital Plan

The IT Infrastructure program consists of some 160 asset projects that range over small, medium and large scale with the following lifecycles all based on economic efficiency:

- Personal computing and telephony 3-year lifecycle sometimes extended to 4 years due to competing priorities.
- Data storage has a 4-year economic cycle and then replacement takes place in the 5th year.
- Systems processing and all other technologies have a 5-year cycle except for communications.
- Communications networks are provided as a service by outsourced telecommunications companies selected by competitive tender. The external communications networks are owned by the outsourced service provider or partner organisation. Replacements, higher capacity with growth and upgrades all require capital projects. The lifecycle is determined by the service provider and external asset owner but is typically 7 years or greater.
- Enabling communications technologies such as routers, switches and other network devices are owned and operated by Jemena. The lifecycle is a minimum of 5 years.

The IT infrastructure plan and program of work is costed at $26.6M over the EDPR 2016 period. The program of work has been further broken down into 8 sub categories listed below:

1. Data Storage and Management.
2. Platforms and Processing.
3. End User Services.

4. Security Services.
5. Systems Management and Operations.
6. Communications and Network Services.
7. Facilities and Data Centres.
8. Business and Systems Growth.

Each sub category has the IT assets within that sub-category listed. For each IT Infrastructure asset an asset lifecycle plan has been defined and described in the subsequent sub-sections. The lifecycle asset management plans commence from sub-section 13.17.1. There are some 160 IT Infrastructure assets in the plan with identical assets listed as 1 asset line item, for the purposes of this IT asset management plan.

Asset Condition

The current condition of the IT Infrastructure is assessed as good and well supported with maintenance and support agreements. However, some IT infrastructure assets are beyond their useful economic life and a significant percentage are reaching end of vendor support in the near future. This means there is a small but significant backlog of infrastructure assets that would have been replaced if the time, funding and priorities were available.

Between 2016 and 2020 all IT infrastructure will complete at least one full lifecycle that includes replacement of every item. The replacement is due to:

- Becoming uneconomic with escalating costs to sustain the products and services being greater than the cost of replacement over time.
- Reaching a state of unacceptable risk due to the vendor or manufacturer no longer providing maintenance and support for the product.
- Being no longer compatible with the application solutions it needs to support in terms of meeting performance standards including capacity and response times.
- The age of the technology means it cannot operate in conjunction with other new applications and technologies and therefore must be upgraded or replaced.

The IT Infrastructure Program capex detailed in Appendix A – IT Infrastructure, represents 24% of the overall IT capex.

In the following sub-sections each IT Infrastructure category is listed by IT asset with its corresponding lifecycle asset management plan and costs from 2016 to 2020.

9.17.1 DATA STORAGE AND MANAGEMENT – PROJECT 274

The data storage management sub-category encompasses all IT assets that store and manage data for all of JEN. The program of work for this sub-category and capital costs of the projects to acquire, build and deploy is set out below. The capital plan includes incremental costs of additional asset units which are treated as small projects largely consisting of procurement and installation work effort.

The data storage hardware is used for 4 years and then replaced, as the cost of retaining the products with higher maintenance agreements costs becomes uneconomic in terms of total cost of ownership. Hardware maintenance agreements are increased after 4 years, at renewal time by the vendor, as the newer technologies consistently improve and can be offered at a lower cost of total ownership per unit of storage.

The data storage investments consist of:

- Replacement of current data storage hardware. This is based on moving to the latest [c-i-c] [c-i-c] . However, Jemena will go to market with a competitive tender for this storage component estimated at up to $3M.
- Upgrade or replacement of the current SQL data management technologies to the most recent version. A business comparison will be made on the planned upgrade compared to the replacement technologies available at the time each hardware item it supports is replaced.
- Retire or upgrade the current Oracle databases and update with the next version of the Oracle products. Provision is made to conduct an annual rolling replacement or upgrade program each year to have a manageable workload over time for these technologies.

The smaller scale investments are described in the table on the next pages.

Replace the Enterprise Storage Platform

The current enterprise storage platform was implemented as part of the data centre relocation project in 2011/12 and hence a systems replacement and retirement project would normally fall due in 2017.

In this case, Jemena plans to extend the life of the current storage platform until 2018. This increases the value returned from the asset while operational impacts from extending the life of the current solution are considered minimal. If a requirement comes up for more modern storage prior to this date, Jemena's current capability for storage virtualisation allows flexibility to integrate newer technologies within the current enterprise storage platform.

A market tender for the replacement will consider multiple sourcing options for the delivery of the products and services including "cloud" based infrastructure, facilities managed or in-house managed.

The cost estimate for this project is based on the previous actuals for the replacement of the enterprise storage platform.

Upgrade and Consolidate Enterprise Database Platform

The consolidation of the enterprise database platform is a Systems Replacement and Retirement project.

Jemena currently has around 500 databases on mainly Oracle and Microsoft SQL Server platforms. The IT infrastructure program of work aims to reduce this number and rationalise the database portfolio through consolidated solutions, fewer applications, retirement of legacy systems and the introduction of a data warehouse with new data analytics and reporting tools.

The IT strategy calls for a single preferred enterprise database platform and, wherever possible, solutions will transition to this single platform as their upgrade/replacement cycles fall due over the coming EDPR 2016 period.

Microsoft SQL Server has been selected as the preferred platform of choice based on the following criteria:

- Support for all Tier 1, 2 and 3 applications.
- Sourced from a Tier 1 vendor from our existing relationships.
- Lowest Total Cost of Ownership over 5 years.
- Support for deployment on commodity based hardware (Intel x86-64).

As a direct result of this consolidation of databases, Jemena expects to reduce both future capital and maintenance costs of database implementations by up to 50%.

Storage Capacity Growth

JEN experienced large increases in year-on-year data storage growth and requirements during the current EDPR 2011 period. Data growth is driven by the following factors:

- Introduction of new and additional systems capability.
- Greater use of image and video data types requiring much larger storage, such as Geospatial Information Systems and Learning Systems.
- The cumulative effect of data retention rather than hard-copy offsite archiving.
- Increased regulation, both energy and non-energy, requiring new information, more tracking and documentary evidence held electronically.
- Greater use of personal and mobility technologies increasing the level of communication data such as email.
- The trend is evident in all businesses as well as energy and the trend is expected to continue with the increasing take up of smart technologies, mobility solutions and multi-media data formats.

From our historic data, growth has trended from 15% to 20% per year and the predicted data growth year-on-year is estimated to stay at 20% for the planning horizon.

Lifecycle Upgrades of the Backup Media and Tape Storage Devices

The backup infrastructure including the robotic tape library and media servers are planned for replacement in 2016 and 2017 respectively. The robotic tape library will require two replacements in the EDPR 2011 period in-line with the Asset Management Plan. The current systems are reaching capacity in terms of data throughput and storage media.

Implementing the technology improvements mitigates the risks of running ageing equipment that does not provide the necessary features and functions required for the purpose. The systems performing backup and recovery at replacement take advantage of the economies of scale driven by increased workloads and data growth.

Consolidation of Content Management to a Single Platform for Unstructured Data

OpenText has been implemented as the enterprise wide system for unstructured data content management. However, previous versions of OpenText did not provide for other specific needs such as team sites, collaboration and integrated presence. To fill these functional gaps, Microsoft SharePoint was implemented, with a view to consolidation in the EDPR 2016 period.

The OpenText system is being upgraded in the current EDPR 2011 period and new functionality in the latest version is being leveraged to provide team sites, integrated presence and collaboration services. Expanding the capabilities of the OpenText solution reduces the reliance on SharePoint for those capabilities and hence will see the migration of current SharePoint unstructured data to the OpenText system in EDPR 2016.

Table 16 – Data Storage and Retention Projects

Data Storage & Management - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Data Storage	Block Based Storage	Hitachi SAN	Systems Replacement & Retirements	Migrate to the next storage platform. This may not be Hitachi. Evaluation will occur to determine if this is still the right storage platform.	[c-i-c]
Data Storage	Database	SQL	Systems Replacement & Retirements	Replace System to the latest version of SQL and consolidate where possible	
Data Storage	Database	SQL	Systems Replacement & Retirements	Replace System to the latest version of SQL and consolidate where possible	
Data Storage	Database	Oracle	Systems Replacement & Retirements	Retire Oracle database where possible, Replace with the next version if not, rolling cost per year, 20% per year	
Data Storage	Database	Oracle	Systems Replacement & Retirements	Retire Oracle database where possible, Replace with the next version if not, rolling cost per year, 20% per year	
Data Storage	Block Based Storage	Hitachi SAN	Organic Growth and License Renewal	Increase Storage capacity by 20% TB per year growth factor	
Data Retention	Backup Systems	SUN StorageTek LTO 5	Systems Replacement & Retirements	Retire the SL 500 and update to the latest tape library with tape size increase every 5 years, includes storage and tape unit	
Content Management	Document & Record Management	Livelink / SharePoint	Enhance, Remediate & Change	Consolidate Content into a single technology and implement collaboration	
Data Retention	Backup Systems	NetBackup Media Server Appliances	Systems Replacement & Retirements	Replace NetBackup Media servers	
Data Storage	File Based Storage	HNAS	Systems Replacement & Retirements	Migrate to the next storage platform. This may not be Hitachi. Evaluation will occur to determine if this is still the right storage platform.	
Data Retention	Backup Systems	Tapes	Systems Replacement & Retirements	Procure next gen tapes	
Data Retention	Backup Systems	NetBackup	Systems Replacement & Retirements	Replace NetBackup to the next version	
Content Management	Document & Record Management	SharePoint	Systems Replacement & Retirements	Upgrades SharePoint to next relevant version	
Data Retention	Archiving	HDS HCP	Enhance, Remediate & Change	Email archive software Upgrade every four years	
Content Management	Document & Record Management	OpenText	Enhance, Remediate & Change	Evaluate content management platform to determine if one technology can perform content management, rather than two.	
Data Retention	Backup Systems	Tapes	Systems Replacement & Retirements	Refresh tapes 10% per annum of total tape number	
Data Retention	Backup Systems	Cloud Archive backups	New Capability	Introduce interfaces to cloud based storage solution for long term low cost archiving	
Data Storage	Consumption Based Storage	New technology to be selected	New Capability	Evaluation of cloud based storage as a viable option	
Totals					

9.17.2 PLATFORMS & PROCESSING – PROJECT 276

Platforms and processing encompasses all technologies that providing the processing capability for applications solution such as CPU, operating systems, technical software, switches and routers.

Each year the specific assets considered due for retirement are business case assessed before proceeding with replacement. This does mean that some IT infrastructure assets continue beyond their planned life due to competing priorities and the level of change and disruption impacts that cannot be absorbed in that year.

Jemena has been consistently consolidating technologies through replacement driving down the variety of hardware and processing platforms. This has been facilitated by substantially reducing the number of software applications in recent years. The reduction in numbers and variety in technologies means fewer

vendors, agreements, skills required and administration resulting in reduced growth in future associated costs. The lifecycle investments for the EDPR 2016 period are:

- Consolidating the data storage infrastructure with a new replacement Storage Area Network (SAN) deployed which will reduce the number of hardware storage devices and simplify their management. The investment will further increase flexibility to optimise the sharing of data and take greater advantage of the economies of scale from consolidated infrastructure.
- [c-i-c]
- Progressively upgrade the Microsoft server technologies each year to the latest versions at the time.
- [c-i-c]
- [c-i-c]
- Provision for organic growth of 2% per annum in technical licenses including operating systems.
- Complete the virtualisation program conducted in the current EDPR period as the software applications supported by the infrastructure are released with versions that will operate on virtualised technologies.

Operating System Environment and Hardware Upgrades, Consolidations and Retirements

The IT infrastructure environment currently has a mixed landscape of Windows, Linux and UNIX systems of various flavours. Proprietary UNIX has now become a legacy operating environment and the IT strategy call for the replacement of UNIX over the EDPR 2016 period, the plan is to reduce operating systems to two operating environments, Windows and Linux.

UNIX systems will be migrated to the default operating environments as they fall due for lifecycle replacements in the EDPR 2016 period. As the hardware is generally tightly coupled with the UNIX operating environment, as the operating environment is replaced the hardware will be replaced at the same time.

Upgrades will also be completed for all the current Windows and Linux based operating environments to ensure the operating systems can support the applications necessary and are in turn fully supported by the relevant software vendor.

Hardware virtualisation will also be implemented, wherever possible, for those few remaining applications where this is not yet in place. Virtualisation provides greater flexibility in deployment, improved disaster resilience and the ability to host multiple applications and mix Operating Systems on the same hardware.

The IT strategy standardises on Intel x86-64 CPU based hardware. This standardised platform makes procurement, delivery and operations more efficient and supports both Windows and Linux deployments. Wherever possible, proprietary server hardware will be phased out.

In summary, all systems are planned to undergo an operating system/hardware upgrade or replacement in EDPR 2016 and will carry out the following steps as part of their upgrade:

- Unless completely impractical, deployment of the workload onto a Windows or Linux OS.
- Virtualisation, wherever possible, to abstract the OS from the physical hardware layer.
- Deployment of the workload on x86-64 infrastructure.

Upgrade of the Enterprise Integration Bus

This project is a planned upgrade of webMethods as the enterprise "bus" for inter-application communications. The version in use at present is webMethods 8.2 and will move to the latest version current at the time of upgrade.

The project is planned to commence in 2017 and finish in 2018.

Consistent with the steps defined above for the operating systems lifecycle, this project sees the retirement of the UNIX operating environment and Sun SPARC hardware and replacement by a new webMethods environment based on standardised platforms.

Implementation of a New x86 Hypervisor

The hypervisor is the product which allows virtualisation of the hardware platform abstracting the hardware resources from the virtualised operating systems and permits the mixing of Operating Systems and application environments on the same physical server.

The IT strategy calls for a migration from the current VMware product to a Microsoft hypervisor for cost reduction reasons. Jemena engaged an external consultancy firm that identified a two-year positive return on investment for the migration.

The project will proceed by implementing a new base hypervisor farm and migrating workloads from one to the other.

Table 17 – Platform & Processing Projects

Platforms & Processing - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Operating System Services	Server Operating Systems	Microsoft Windows Server	Systems Replacement & Retirements	Replace with the latest version of Microsoft server, rolling 20% per year	[c-i-c]
Operating System Services	Server Operating Systems	Microsoft Windows Server	Systems Replacement & Retirements	Replace with the latest version of Microsoft server, rolling 20% per year	
Integration	Project	Migration of Web Methods to RedHat Linux or Wintel	Systems Replacement & Retirements	Migration of Web Methods to RedHat Linux or Wintel	
Operating System Services	Server Operating Systems	Linux RedHat	Organic Growth and License Renewal	Expand into RedHat environment as default environment for UNIX where Wintel is not viable	
Hardware Systems	Midrange	Solaris T Series Blades	Systems Replacement & Retirements	Decommission system and replace onto different hardware	
Hardware Systems	Enterprise	Solaris M Series	Systems Replacement & Retirements	Decommission and migrate to the latest platform for the specific application	
Hardware Systems	Commodity	SUN Blades	Systems Replacement & Retirements	Retire all blades and migration to different technology	
Operating System Services	Server Operating Systems	Solaris	Systems Replacement & Retirements	Decommission with hardware, or migrate to Linux, 20% per year	
Hardware Systems	Midrange	Sun Blade Chassis	Systems Replacement & Retirements	Migrate from the SUN chassis to HP C7000 chassis	
Hardware Systems	Commodity	HP BL460c	Systems Replacement & Retirements	Replace the servers as they become end of life, rolling 20% per year	
Virtualisation	Compute Virtualisation	VMWare	Systems Replacement & Retirements	Build new hosts for virtual environment or Replace VMware servers	
Hardware Systems	Commodity	C7000	Organic Growth and License Renewal	Increase capacity to accommodate technology migrations from Solaris	
Presentation Systems	Multi-Tenant Presentation	Citrix XenApp	Systems Replacement & Retirements	Replace with the latest Citrix XenApp, 50% each year for two years	
Hardware Systems	Commodity	SUN Standalone	Systems Replacement & Retirements	Database and VMware hosts for AMI to migrate to alternate platform	
Hardware Systems	Commodity	C7000	Systems Replacement & Retirements	Replace with the latest version of the chassis	
Integration	SAP to AD integration	Control-SA Enterprise Security	Systems Replacement & Retirements	Retire the Control-SA and move to alternate technology as vendor no longer supports this technology	
Presentation Systems	Client Presentation / Virtualisation	New technology to be selected	New Capability	Introduce Virtual Desktops to decouple from hardware and centralise in the data centre	
Hardware Systems	Midrange	Solaris T Series Blades	Systems Replacement & Retirements	Decommission and migrate to the latest platform for the specific application	
Operating System Services	Server Operating Systems	AIX	Systems Replacement & Retirements	Decommission system or migrate to Linux, 20% per year	
Hardware Systems	Enterprise	IBM Power System	Systems Replacement & Retirements	Decommission system because it is being migrated into other systems	
Hardware Systems	Enterprise	Solaris M Series	Systems Replacement & Retirements	Decommission and migrate to the latest platform for the specific application	
Hardware Systems	Commodity	HP DL 360	Systems Replacement & Retirements	Migrate to blade servers or virtual machines, 20% per year	
Hardware Systems	Enterprise	IBM Power System	Systems Replacement & Retirements	Decommission system because it is being migrated into other systems	
Virtualisation	Application Virtualisation	New technology to be selected	New Capability	Implement application virtualisation	
Operating System Services	Server Operating Systems	Linux RedHat	Organic Growth and License Renewal	Upgrade to the latest environment, 20% per year	
Integration	SAP to AD integration	New version of SAP integration	New Capability	Add automation and orchestration to the technology	
Totals					

9.17.3 END USER SERVICES – PROJECT 278

End user services consist of technologies and devices used directly by JEN workforce needed to perform their role as well as the means to support and service those technologies. The devices include desktop and laptops computers, mobility devices and bar code readers.

Desktop and laptop computers are replaced on a rolling annual cycle based on a 3-year economic life. This means a device is typically used for at least 3 years and then replaced during its 4th year of operation after the end of its depreciated life and aligned with its economic and technological life for compatibility with newer systems. Their replacement is separate to the replacement of the end user application software, such as Microsoft Office and e-mail which is planned on a 7-year cycle and most recently replaced in 2011/12 to 2012/13.

Tablets are currently purchased at the discretion of the business units. The standard policies and issue of tablets will be determined as part of the new field and corporate mobility projects and solutions. In future years Jemena plans to use more tablets reducing the use of laptop computers and enabling staff to be even more mobile.

Jemena has planned 2 mobility projects introducing the ability to work from anywhere that public mobile and Wi-Fi networks can be accessed supplemented by satellite for remote locations and workers. The 2 projects are:

- Corporate mobility for office based staff members and any tracking or data reading activities.
- Field mobility for all members of the workforce who work outside an office designing, building, inspecting, maintaining and servicing the network.

Jemena plans to make greater uses of smart technologies such as smart phones and tablets including hybrid tablets and laptops combined in the one device. This sub-category maintains the devices for all mobility solutions in future.

Standard Operating Environment (SOE) for Next Generation End User Hardware

This project adds a new capability with tablet support. Efficiency gains are expected from the deployment of a range of mobility solutions across a broad cross-section of corporate and field staff during the EDPR 2016 period and support for these solutions within the IT infrastructure is a necessary enabler. This project will:

- Uplift the required backend infrastructure services to enable tablets and next generation operating systems.
- Provide a fleet of tablets to those employees who gain workplace efficiencies from their use.
- Offer the next generation devices where these become ready for lifecycle replacement.

Adoption of the next generation devices for end user computing is planned to commence in 2016/17 as mobility projects deploy applications using these devices. In many cases, particularly among field workers, this will provide for new users that currently do not have end user devices.

There will be a natural uplift of the operating system as a direct result from the deployment of tablet devices, as there is limited availability and support for the current end user OS, Windows 7, on tablets. Furthermore, ease of use is an important enabler to the success of the rollout of field mobility devices and Windows 8 has many features to improve the end-user experience on tablets.

Lifecycle Replacement of End User Devices

The planned lifecycle of personal devices such as desktops, laptops and tablets is 3 years with replacement in the 4th year. This is supported by regular and on-going activity throughout EDPR 2016 to maintain the fleet as the equipment falls due for replacement.

After 2018, the replacement devices are planned to be at a minimum of Windows 8.

Implementation of Mobility Device Management (MDM) System

The implementation of an MDM solution is a new capability planned for 2016. This project will lay the foundation for several capabilities, namely:

- The ability to centrally secure and control devices with next generation operating systems, such as Windows 8.
- The ability to securely deploy applications and data to staff owned (BYOD) equipment, without impacting the local applications or data.
- To ensure the secure connectivity from devices on the public facing networks with encrypted network connectivity to Jemena's internal network.
- To secure applications and data on the devices with services such as local encryption and remote wipe.

Infrastructure Services

Infrastructure services encompass all email services, user addresses, directory services and the profiles of individual users for the purposes of assigning their usage of systems and technologies. It includes the automation of batch control and scheduling automation of production operations for the email, directory and systems assignment functions.

The investment in this area is low due to the longer life of the assets at 5-7 years and their small scale not driven by user numbers, customers or connections. The investments described in the table below include:

- Replace the current Microsoft Exchange technology at the end of its 5 year life in 2017.
- Upgrades to existing batch control and scheduling.
- Improvements to the B2B technologies.
- The addition of capability for the introduction of the new Linux operating environments.

Table 18 – End User Services Projects

End User Services - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
End User Operating System Services	Corporate	Windows Desktop OS	Systems Replacement & Retirements	Replace with the next version of desktop OS, potentially VDI solution and tablet, current plan will be Windows 8.	[c-i-c]
End User Hardware Devices	Corporate standard	Latitude E5430 ($1150)	Systems Replacement & Retirements		
End User Hardware Devices	Corporate standard	OptiPlex	Systems Replacement & Retirements		
End User Hardware Devices	Field Standard	Latitude E5530 Laptop ($1200)	Systems Replacement & Retirements		
End User Hardware Devices	Corporate Light Weight	Latitude E6230 (1850)	Systems Replacement & Retirements		
End User Hardware Devices	Mobility tablet	New technology to be selected	New Capability		
End User Hardware Devices	Tough	Toughbook CF-H2 ($4560)	Systems Replacement & Retirements		
End User Hardware Devices	Field Other	Precision M4700 ($2210)	Systems Replacement & Retirements		
Totals					

9.17.4 SECURITY, TECHNOLOGY AND SERVICES – PROJECT 280

[c-i-c]

[c-i-c]

[c-i-c]

[c-i-c]

Table 19 – Security, Technology & Services Projects

Security Services - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Intrusion Protection and Prevention	IDS / IPS	SourceFire	Systems Replacement & Retirements	Replace SourceFires to the latest version	[c-i-c]
Network Isolation and Control Systems	Network Security	Various Firewalls	Systems Replacement & Retirements	Replace miscellaneous firewalls, rolling 20% per annum	
Network Isolation and Control Systems	Core Firewall	Checkpoint	Systems Replacement & Retirements	Consolidation of firewalls into less firewalls	
Network Firewall	Core Firewall	Checkpoint	Systems Replacement & Retirements	Replace with the latest version	
Network Isolation and Control Systems	Network Security	Checkpoint Management Device	Systems Replacement & Retirements	Replace with the latest version	
Malicious Code Protection	Anti-Virus / Malware systems	McAfee E-Policy Orchestrator	System Upgrades	Upgrade to latest version	
Malicious Code Protection	Anti-Virus / Malware systems	McAfee	Systems Replacement & Retirements	Replace with the latest client version	
Authentication Services	Two Factor Authentication Services	RSA	Systems Replacement & Retirements	Replace with the latest System	
Authentication Services	Central logon to network devices	TACACS	Systems Replacement & Retirements	Replace with the latest System	
Verification Systems	Certificate Issuing and Management	Microsoft Certificate Authority CA/PKI	Systems Replacement & Retirements	Upgrade to the latest Certificate services	
Verification Systems	Certificate Issuing and Management	External VeriSign Certificate renewals	Organic Growth and License Renewal	Renew SSL certificates and re install onto devices	
Enterprise Monitoring and Alerting	Security Information & Event Management	Huntsman	New Capability	Implement a SIEM tool (Security Information and Event Management)	
Authentication Services	Identity and Access Management	Identity and Access Management (IDAM)	New Capability	Implement IDAM	
General Security	General Security	General Security	Enhance, Remediate & Change	Enhance, remediate and change all security technologies	
Data Loss Prevention	Data loss Prevention	New technology to be selected	New Capability	Implementation of data loss prevention technologies and processes	
Data Loss Prevention	Mobile Device Management	New technology to be selected	Organic Growth and License Renewal	Implementation of Mobility management technology, including MDM and EMM	
Risk Management	ISO 27001 Certification	ISO 27001	New Capability	Complete the ISO 27001 audit	
Enterprise Monitoring and Alerting	Full Packet Capture for SIEM	Huntsman	New Capability	Enable the full packet capture in SIEM	
Verification Systems	NESSUS SCAN	NESSUS	New Capability		
Security Controls	Ruleset analysis	Tufin	New Capability	Implement central firewall ruleset analysis and control technology	
Security Controls	24/7 monitoring	New service to be selected	New Capability	Implement 24/7 monitoring technology	
Security Controls	Whitelisting	New technology to be selected	New Capability	Application and network whitelisting	
Security Controls	File Integrity Monitoring	New technology to be selected	New Capability	Implement file integrity monitoring services	
Network Segregation	Physical Isolation	Checkpoint	Enhance, Remediate & Change	Further segregation of control networks from corporate networks with newer technologies	
Directory Services	Authentication Services	Microsoft Active Directory	Systems Replacement & Retirements	Replace with the latest AD technology	
Directory Services	Account Directory Services	Directory Services	New Capability	Implement Linux Active Directory Integration tool	
Directory Services	Authentication Services	Microsoft Active Directory	Enhance, Remediate & Change	Implement a separate Active Directory for external users to improve B2B and external party access	
Immutable Servers	Emerging Technology	Imperva	New Capability		
Totals					

9.17.5 SYSTEMS MANAGEMENT & OPERATIONS – PROJECT 282

This sub-category encompasses the technologies and tools that are applied to operate production systems, operate systems development environments and for IT disaster recovery processes and their activation. The IT operating functions and processes supported by the technologies are:

- Systems installation.
- Live systems deployment.
- Systems back-up and recovery.
- Application packaging that work in combination to form a solution.
- Systems configuration management.
- Change control.
- Managing systems patches.
- Operations scheduling, run sequence and execution.
- Control of hardware devices.
- Control of mobility devices.
- Software management.
- Capacity planning tools that monitor usage levels over time and for predictive analysis to plan acquisitions of increased capacity.
- Event management for the automated logging and manual recording of problem events as well as supporting their resolution.
- Systems detection and usage for software licensing purposes including end of year licensing payments for growth in usage also known as “True Up”.

The capital investments for systems management operations consist of a series of small-scale cost items to upgrade and replace the tools. The investments include the addition of new small-scale capability more automated control over software patching and event management.

The plans and costs by technology, tool and year of activity are described in the tables below.

System Upgrade of the Enterprise Monitoring Platform

The current enterprise monitoring platform is HP Operations Manager and is due for a lifecycle upgrade or replacement in 2016.

Enhanced functionality expected from the upgrade/replacement is expected to come from the ability to implement business process monitoring in-line with the technologies that underpin that process. Key business stakeholders will have the ability to view a portal with real time monitoring of business process status.

The project will investigate the relative value in continuing with an upgrade of the current solution, or moving to an alternative, at the time of the upgrade. The current plan and cost estimate is based on an upgrade.

Lifecycle Upgrade of Backend Microsoft Systems

Current data centre tools include Microsoft System Centre Configuration Manager (SCCM) and System Centre Operations Manager (SCOM) and these are due for upgrade in 2016.

Allowing for the features and functions made available in the latest versions and mitigating the risk of running an ageing infrastructure service are the key drivers for the upgrade.

Some of the new features that provide benefits are:

- Operating and managing next generation Operating Systems such as Windows 8 and Windows Server 2012.
- Tight integration with a planned automation and orchestration engine (see below).
- Cloud integration to enable workloads from the cloud to be managed.
- Ability to manage mobility devices.

Automation and Orchestration Tool

An enterprise automation and orchestration tool is planned for implementation in 2016 to improve infrastructure related tasks to meet business expectations. The automation and orchestration tool will target repetitive and costly manual processes currently performed by Jemena operations staff. Examples of processes that will be targets for automation and orchestration are:

- User provisioning / de-provisioning - Currently a largely manual process with access to systems, archiving of data, and other tasks being completed manually.
- Implementation of infrastructure services - Deployment of servers, storage, databases and entire development systems should be largely automated by the new tool.

This tool will deliver operational efficiencies with a reduction in human errors, and allow resources to be redirected into improving services. An additional future value will be the ability to automate and orchestrate to cloud services. IT projects and developers will gain agility and reduced time to deploy.

Service Management and Help Desk

The service management application software and tools have reached their end life and need to be replaced to avoid the unacceptable risk of support becoming unavailable from the vendor Hewlett Packard. In addition the current application is old in terms of underlying technologies and design that makes it cumbersome to use and more labour intensive compared to contemporary, market sourced products available today.

The project replaces the legacy service management and helpdesk systems as a prudent investment. In addition the project improves the services and processes including the use of self-service to be a more efficient. The project capex is shared across the Jemena group providing JEN with the benefits of economies of scale.

Table 20 – Systems Management & Operations Projects

Systems Management & Operations - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Enterprise Monitoring and Alerting	Enterprise	HP Operations Manager	System Upgrades	Upgrade to the latest version	[c-i-c]
Application Deployment	Server Applications	Microsoft System Centre Configuration Manager	Systems Replacement & Retirements	Replace with the latest version of SCCM and repackage applications for streaming or isolation where applicable	
Enterprise Monitoring and Alerting	Enterprise	HP Operations Manager	Enhance, Remediate & Change	Link HPOM to enterprise process view and portals with dashboards of business processes	
Process Automation	Enterprise Automation and Orchestration	Microsoft Orchestrator	New Capability	Introduce an enterprise automation and orchestration engine to complete infrastructure and application tasks, for example provisioning	
Software and Asset Management	Software and Asset Management	Flexera	New Capability	Software Asset Management implementation	
General Management	General Management	Miscellaneous management software	Systems Replacement & Retirements	Replace and consolidate the various 20 management software to the latest version, rolling 20% per year	
Patch Deployment	Enterprise Server Hardware Systems	Oracle	New Capability	Introduce Oracle patching to centrally patch Oracle hardware and software	
Process Automation	Batch Control and Scheduling Systems	Control-M	System Upgrades	Upgrade to version 8.x to be supported. Increased ease of use, FTP based module. Batch impact module for forecasting and	
Event Management	Event Correlation	New technology to be selected	New Capability	Introduce event log correlation	
Database Management	Oracle	Oracle Enterprise Manager (Grid Control)	Systems Replacement & Retirements		
Application Deployment	Server Applications	Satellite	New Capability	Implementation of software packaging and deployment for Linux based operating environments	
Event Management	Monitoring and Alerting	System Centre Operations Manager	Systems Replacement & Retirements	Replace with the latest version	
Patch Deployment	x86 Server Hardware Systems	HP Insight Management	New Capability	Implementation of patch, firmware management for x86 hardware	
Network Management	Enterprise	Solarwinds	Systems Replacement & Retirements	Replace with the latest Network Management technology	
Process Automation	Enterprise Automation and Orchestration	Control M	Systems Replacement & Retirements	Replace automation engine to the latest version	
Application Deployment	Application Packaging	Admin Studio / Flexera	Systems Replacement & Retirements	Replace with the latest version of the technology	
Network Management	Network Management	Solarwinds	Systems Replacement & Retirements	Replace with the latest version	
Patch Deployment	End User Hardware Devices	New technology to be selected	New Capability	Provide firmware and support software upgrades to end user devices centrally	
Patch Deployment	End User Hardware Devices	New technology to be selected	New Capability	Provide firmware and support software upgrades to mobility devices centrally	
Totals					

9.17.6 COMMUNICATION AND NETWORK SERVICES – PROJECT 284

Communications and network services encompasses all technologies and projects related to the provision of telephony, wide area networks (WAN), local area networks, Wi-Fi facilities, satellite, radio and broadband optical fibre facilities.

Communications networks are largely outsourced and replacement, therefore, is decided by the service provider with planning and the capital costs of change determined as required.

Over the next 7 years JEN will be replacing analogue radio networks and ageing metering networks related to the collection of meter data. The adoption of 3G and 4G cellular communications and the roll

out of the National Broadband Network (NBN) will all form part of the replacement of the current communications capability. Specific strategies and solutions will be on a case by case basis with some decisions held over until the Federal Government redefines its plans for the NBN now underway with new plans to be announced in 2014.

Communication networks and technologies have a useful or economic life of 5-8 years and upgrade or replacement will be determined on a case by case basis described in the tables on the next page. PABX and desk telephones have a life of 5 years. Mobile smart phones have a planned life of 3 years as compared to the prior era of mobile phones being phased out at 4 or more years. Mobile phones are a business cost and not included in the IT section.

In 2017 JEN will replace the following communications technologies:

- Network switching, for core switches, encompassing the complete CISCO products that all work together to deliver the services.
- Network switching, for edge switches which consist of a range of general network components.

In the period 2016-2020 there is provision for growth in demand for the uses of communications drive by JEN's increasing scale in response to market growth in energy demand, new customers and connections.

The lifecycle plan and timing over the 5 year period for each communications asset are described in the table on the next page.

Network device lifecycle replacement

As Jemena does not own its own communication links and makes use of a wide range of third party service providers the planned lifecycle replacement of network equipment is driven by factors related to the individual communications services themselves. Replacement of equipment is a regular and on-going activity throughout EDPR 2016 to maintain the switching and routing equipment as it falls due for replacement.

Unified Communications Network Capability Program of Works

The Unified Communications (UC) network capability program of works will upgrade current capabilities including:

- Upgrading the mail messaging system to the latest version.
- Upgrading the instant messaging and presence system to the latest version.
- Replacement and consolidation of Private Automatic Branch Exchange (PABX) and Voice over Internet Protocol (VOIP) gateway devices.
- Enhancement of the current Interactive Voice Response (IVR) system.

The program will also include a migration from older Integrated Services Digital Network (ISDN) and Primary Rate Interface (PRI) lines to modern, carrier based Session Initiation Protocol (SIP) links capable of carrying voice and data together. This allows the hard-wired lines into regional offices to be retired and the implementation of VoIP over the data links between the offices and the central location. This will reduce telecommunication cost escalation and leverage the work performed in the current EDPR 2011 period implementing foundation UC capabilities.

This program of works focuses purely on the back-end infrastructure and specifically excludes end user devices, such as handsets, tablets or mobile phones.

Table 21 – Communications & Network Services Projects

Communications & Network Services - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies, rolling 20% per year	[c-i-c]
Network Switching	Edge Switch	General Network Components	Systems Replacement & Retirements	Replace with the next version, rolling 20% per year	
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies	
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies	
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies, rolling 20% per year	
Network Switching	Core Switch	CISCO Wireless	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies, rolling 20% per year	
Network Routing	Edge Router	CISCO	Systems Replacement & Retirements	retire and replace with latest version of router, rolling 20% per year	
Network Switching	Core Switch	CISCO NEXUS	Systems Replacement & Retirements	Consolidation of all core switches into this virtual layer. Have another layer between servers.	
Unified Communication Systems	Phone PABX	PABX	Systems Replacement & Retirements	Replace or retire PABX	
Network Routing	Edge Router	CISCO	Systems Replacement & Retirements	retire and replace with latest version of router	
Network Control and Management	Network Acceleration and Control	Riverbed Steelhead (Edge)	Systems Replacement & Retirements	Retire and replace with QoS device	
Unified Communication Systems	Email storage and delivery	Microsoft Exchange	Systems Replacement & Retirements	Build and migrated to the latest version of Exchange.	
Network Control and Management	Global Load Balancers	F5 Big IP	Systems Replacement & Retirements	Replace with the next version of technology that supplies load balancing.	
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version of core switching. Evaluate technologies, rolling 20% per year	
Remote Access	Site to Site VPN	CISCO ASA	Systems Replacement & Retirements	Replace firewalls to latest version	
Network Control and Management	Network Acceleration and Control	Riverbed Steelhead (Core)	Systems Replacement & Retirements	Retire and replace with QoS device	
Network Control and Management	Local Load Balancers	F5 Big IP	Systems Replacement & Retirements	Replace with the next version of technology that supplies load balancing.	
Application Proxy	Reverse Proxy	Threat Management Gateway	Systems Replacement & Retirements	Retire TMG and move functionality to NetScalers or F5s	
Application Proxy	Internet Proxy	Application Proxy	Systems Replacement & Retirements	Procure an appliance to replace the TMG and Add priority and queues to ensure limited bandwidth for non critical internet access	
Unified Communication Systems	Telephony	Telstra	Enhance, Remediate & Change	Implement feature changes to the current IVR systems inline with business processes	
Unified Communication Systems	Instant Communications	Microsoft Lync	Systems Replacement & Retirements	Replacement Lync to the latest version	
Network Switching	Core Switch	CISCO Catalyst	Systems Replacement & Retirements	Move to the next version	
Network Control and Management	Global Load Balancers	F5 VIPRION	Systems Replacement & Retirements	Replace with the next version of technology that supplies load balancing.	
Network Routing	Integrated Services Router	CISCO ISR	Systems Replacement & Retirements	retire and replace with latest version of router	
Transport Protocol	TCP/IP	TCP protocol	Enhance, Remediate & Change	Modify network to run on IPV6, modify processes, documentation, architecture	
Network Control and Management	DHCP	Microsoft DHCP	Enhance, Remediate & Change	Implement DHCP clustering	
Remote Access	Client VPN	Citrix NetScaler	Systems Replacement & Retirements	Replace with next version	
Network Switching	Core Switch	CISCO NEXUS	Systems Replacement & Retirements	Consolidation of all core switches into this virtual layer. Have another layer between servers.	
Location Services	Domain Naming Services	Microsoft Active Directory	Systems Replacement & Retirements	Replace with the latest DNS integrated with AD technology	
Totals					

9.17.7 FACILITIES AND DATA CENTRES– PROJECT 288

The facilities and data centres sub-category encompasses the technologies associated with any buildings, property and data centres used by Jemena. For the period 2016-2020 provision is made for:

- Relocation of the Sydney data centre facilities to be consolidated into the Jemena enterprise data centres, to simplify data centre related facilities, lower risk and be more efficient.
- Many of the network operating technologies have existed outside of the main Jemena offices or data centre. As those technologies are replaced with newer devices they are being located inside data centres and operated from control rooms using their new application software and communications technologies. Provision is made in the data centres to accommodate the replacement operating technologies. The investments make prudent use of space in secure locations and are enabled by the new replacement technologies including the balancing of equipment across disaster recovery facilities. The consolidation of the technologies into the data centres also brings efficiencies for management, maintenance, support and any break-fix activities previously conducted in the field or at disparate sites across the JEN geographical area.

Note:

The provision for data capacity growth is detailed in sub-section IT Infrastructure Growth which encompasses all JEN market growth in demand, customers and connection. The growth plans for data centres includes consolidating [c-i-c] [c-i-c]

Table 22 – Facilities & Data Centres Projects

Facilities & Data Centres - Function	Category	Technology	Activity Category (investment type)	Activity Description (technical Description)	Totals 2016-20
Data Centres	Consolidation	Migration activity	Enhance, Remediate & Change	Migration of technologies outside of the data centres into the central data centre	[c-i-c]
Totals					

9.17.8 CAPACITY GROWTH – PROJECT 288 - 296

The IT infrastructure growth section provides for incremental growth in terms of units and technical software licenses each year. The nature of the growth for each item listed in the table below is described in the subsequent paragraphs.

Data Centres

Jemena does not own data centres, it owns the IT infrastructure inside the facility that runs operates and support the Jemena systems.

- Data centres organic growth provides for more racks and devices to house the technologies resident in the data centre and for any expansion work such as racks, cabling and their installation costs.

[c-i-c]

Business and Systems Growth

- **Project – 288** Costs for the growth in infrastructure capacity for the new data warehouse once is implemented.
- **Project – 290** Organic Growth – represents the rate of business growth for existing systems as at 2013/14 in terms of JEN customers, connections and transactions being processed.
- **Project – 292** Natural Growth – represents the growth in new SAP capability for corporate systems processing volumes including human resources self-service, learning management, governance and risk management.
- **Project – 294** Increase in Data Warehouse capacity above natural growth.
- **Project – 296** Provision for growth in:
  - New small scale systems.
  - Extended usage of current systems for more users.
  - Take up of unused functionality.
- **Project – 298** Provision for Project office accommodation.

A summary of Infrastructure growth capex is covered in Appendix A – IT Infrastructure.

9.18 METERING - STANDARD CONTROL SYSTEMS METERING

The Standard Control Metering projects detailed in Appendix A, encompass functionality used by the business to support:

- Network management and performance and reporting
- Network and customer growth
- Network billing

The application assets used to service the above functions are:

- **Network Management**

The network management applications currently used by JEN include:

- SAP IS-U
- webMethods ESB/B2B
- MDM - Meter data Manager
- NMS – Network Management System

- BI – Data warehouse functionality

9.18.1 ASSET CONDITION

The NMS, MDM, SAP IS-U and webMethods applications will all be subject to a software upgrade in the EDPR period. The current versions of the software are all performing to expectation. The upgrades planned are consistent with JEN's policy to maintain the currency of the application versions in operation.

9.18.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Capability Projects**

  There are no new capabilities planned for SCS meters.

- **Extend, Remediate and Change**

  The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

  Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

  The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

  - **Project 310 – Change.** The project occurs continually for SCS meters to ensure the solutions meet market obligations and customer expectations.
  - **Projects 302, 304, 306 &308 – Upgrade**. The projects for SAP IS-U, NMS, MDM and webMethods recur every 3 years and consist of enhancements to the applications for functionality, version management and security. The NMS upgrade is shared with SCS metering on a ratio of 59% Advanced to 41% SCS metering.
  - **Project 312 – Growth.** Planned growth in user licenses for SCS meter users consistent with growth in JEN's business operations.

Maintenance Plan

The metering software assets are supported by vendors and consistently upgraded to stay current as mission critical IT solutions and assets.

A summary of capex is provided in Appendix A – SCS Metering.

9.19 METERING - ONGOING ADVANCED METERING FOR CONTESTABILITY

The Advanced Metering projects detailed in Appendix A, encompass functionality used by the business to support:

- Customer consumption of energy

- Customer growth and change
- Customer and network billing

New functionality will be required for JEN to meet the meter contestability rules to apply from 2016. Changes will need to be made to the SAP IS-U application to support these changes.

The application assets used to service the above functions are:

- **Network Management**

The network management applications currently used by JEN include:

- SAP IS-U
- webMethods ESB/B2B
- MDM - Meter data Manager
- NMS – Network Management System
- BI – Data warehouse functionality

9.19.1 ASSET CONDITION

The current versions of the software are all performing to expectation. The upgrades planned are consistent with JEN policy to maintain the currency of the application versions in operation.

9.19.2 LIFECYCLE MANAGEMENT PLANS

Capital Plan

- **Meter Contestability** **Project 316**

AMI meters are to become contestable in 2016. A project, to support the contestability proposal and associated meter data flows, is required to meet regulatory obligations and is planned for completion in 2016 in line with legislation. JEN is yet to receive a detailed specification and rules for meter contestability.

- **Extend, Remediate and Change**

The extension of applications involves the take up of unused functionality. This may be pre-existing capability or resulting from software upgrades available within implemented solutions or the take up of implemented functionality by more users.

Remediation involves correcting or optimising the performance of software applications not performing to the required service standards. Remediation is mostly IT opex, however at times new investment is required to meet the performance standards and to mitigate risk.

The service changes are for small-scale ongoing modifications to current systems as a result of changes in the business or technical environment needing to be reflected in the application systems.

- **Project 318 – Change.** The project occurs continually for Advanced meters management to ensure the solutions meet market obligations and customer expectations.

- **Project 320 – Upgrade**. The upgrade project for NMS occurs every 3 years and consists of enhancements to the applications for functionality, version management and security. The project is shared with SCS metering on a ratio of 59% Advanced to 41% SCS metering.
- **Project 322 – Growth.** Planned growth in user licenses for advanced meter users consistent with growth in JEN's business operations.

Maintenance Plan

The metering software assets are supported by vendors and consistently upgraded to stay current as mission critical IT solutions and assets.

A summary of capex is provided in Appendix A – Ongoing Advanced Metering.

9.20 IT PROGRAM OF WORK ROADMAP

Figure 20 – Jemena IT Program Delivery Timelines

[c-i-c]

10. IT OPERATIONS

10.1 OVERVIEW

Jemena has overall management of IT operations. IT Operations encompass the following range of services:

- General IT Management and Administration.
- IT Strategy and Architecture.
- Relationship management with the Jemena group of business stakeholders.
- Day to day operation of production systems and IT disaster recovery.
- Procurement of software, hardware, and services.
- Vendor and services agreements management, monitoring and administration.
- Costing, budgeting and financial management of IT systems.

10.2 IT OPERATIONS SERVICES PROVISION

IT Operations, maintenance and support are managed by Jemena with outsourced IT communications provided by Telstra.

In the past 3 years the IT Operational costs have been contained through a combination of factors including:

9. Replacement and refresh of the end of life technologies that resulted in:
    a) The lowering of maintenance and support costs.
    b) Increased capacity and processing power per dollar invested lowering depreciation and costs per service unit.
10. Consolidation of systems reducing the number of solutions and products and the associated costs of management, maintenance, support and administration in terms of:
    a) Staffing levels.
    b) Costs of IT services per business function.

1. Competition in the awarding of contracts for the provision of software and hardware.
2. In sourcing of facilities management.
3. Insourcing of a range of level 2 support for some of the more complex solutions to be more efficient and at lower cost.
4. Increasing productivity per staff member resulting in lower costs due to fewer systems, improved processes and up to date tools.
5. The rise in the purchasing power of the Australian dollar.
6. Technical improvements in the virtualisation of almost all solutions processing.

7. New replacement technologies that provided for the same investment costs more processing, storage and technical efficiency.

All of the above initiatives had a material impact on the reduction in the service in-efficiencies and the resulting reduction in operating costs. The reduction in IT operating costs have been achieved during a 3-year period when the business grew year on year in terms of customers, connections and processing needs by about 2% per annum and retained data grew by about 15% per annum. IT operations services and costs were recently re-base lined led by Jemena with the assistance of Oakton Consulting.

The new baseline and costs were determined to:

- Define and establish the new long term services and costs model following the achievement of the efficiencies listed in this section.
- Define the cost to operate by business function and the associated solutions.
- Establish a new cost sharing model across the Jemena group by using more detailed metrics and the costs by business function solutions.

10.3 IT OPERATIONS PLANS 2016 TO 2020

IT will continue to make service efficiency and cost gains but at a lower rate given recent achievements that will result from:

- The Jemena Consolidation Program lowering some of the current IT user and systems management support and maintenance.
- Taking advantage of the greater processing power and capacity of new technologies as current assets reach the end of the economic life.
- Competitive tension in the marketplace.
- Taking advantage of the potential buying power of the new majority share owners of Jemena in the form of SGSPAA under global software licensing agreements.
- Replacing and consolidating systems to be more efficient and lower costs associated with having fewer vendors.

The gains in operational efficiencies and costs will be offset by the introduction of new capabilities and technologies not currently available that include:

- Increased regulation and compliance demands with supporting information and data.
- Workforce mobility.
- A Geospatial Information System.
- Data Warehouse.
- Greater use of OT systems for non IT managed areas that will require IT facilitation, agreements management, support and disaster recovery.
- The greater use of documents, records and data as we enter an IT era known as “big data” with business analytics and interval metering two examples.
- Greater complexity in solutions and integration.

Appendix A
IT CAPITAL INVESTMENT BREAKDOWN

Jemena

A1. IT CAPITAL INVESTMENT BREAKDOWN

The table below provides detailed costing for projects and activities under each category respectively.

The projects below are referenced in sections 12.6 – 12.19 respectively under 12. EDPR 2016 IT Capital Program of Work by Project Category.

Table A1–1: JEN EDPR IT Capex Plan

JEN EDPR IT Capex Plan				Direct Escalated Costs					
Project ID	Project Name	Extension or Replacement	Recurrent or Non-Recurrent	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
Category: Regulatory & Market Services Systems									
10	Regulatory Reporting	Extension	Recurrent						
12	Regulatory Change Provision	Extension	Recurrent						
14	RIN Reporting	Extension	Non-Recurrent						
16	AEMO Services Change Provision	Extension	Recurrent						
18	Customer Engagement Provision	Extension	Recurrent						
20	Non-Energy Regulation Change	Extension	Recurrent						
22	New Pricing Structures, Methods & Reporting	Extension	Recurrent						
Category Total				[c-i-c]					
Category: Corporate & Office Systems									
24	Desktop Tools Lifecycle Management - Change	Extension	Recurrent						
26	Desktop Tools Lifecycle Management - Licenses Growth	Extension	Recurrent						
28	Desktop Tools Lifecycle Management - Replacement	Replacement	Recurrent						
30	Corporate SAP Portal - Change Provision	Extension	Recurrent						
32	Corporate Web-Site, Internet and Intranet - Refresh	Extension	Recurrent						
34	Corporate SAP Portal Upgrade	Extension	Recurrent						
36	Corporate Mobility Project	Extension	Non-Recurrent						
38	Corporate Mobility - Upgrade	Extension	Recurrent						
40	Corporate Mobility - Licenses Growth	Extension	Recurrent						
Category Total				[c-i-c]					
Category: Finance & Accounting									
42	SAP Governance, Risk & Compliance - Upgrade	Extension	Recurrent						
44	SAP Governance, Risk & Compliance Lifecycle Management - Change	Extension	Recurrent						
46	SAP Governance, Risk & Compliance Lifecycle Management - Replacement	Replacement	Recurrent						
48	SAP Business, Planning & Consolidation	Extension	Non-Recurrent						
50	SAP Financial Systems - Accounting Change	Extension	Recurrent						
52	SAP Financial Systems - Credit Management Change	Extension	Recurrent						
54	SAP Financial Systems - Capital & Asset Accounting Change	Extension	Recurrent						
56	SAP Financial Systems - Treasury Management Change	Extension	Recurrent						
58	SAP Financial Systems - Test Automation	Extension	Recurrent						
60	SAP Financial Systems - Automate the Labour Model	Extension	Recurrent						
62	SAP Systems - Replacement	Replacement	Recurrent						
Category Total				[c-i-c]					
Category: Human Resources, Safety & Incident Management									
64	SAP Human Resources - Human Capital Project	Extension	Non-Recurrent						
66	SAP Human Resources - Human Capital Change	Extension	Recurrent						
68	SAP Human Resources - Managed Self Service Project	Extension	Non-Recurrent						
70	SAP Human Resources - Managed Self Service Change	Extension	Recurrent						
72	SAP Human Resources - Learning Management Project	Extension	Non-Recurrent						
74	SAP Human Resources - Learning Management Change	Extension	Recurrent						
76	SAP Human Resources - Upgrade	Extension	Recurrent						
78	SAP Human Resources - Payroll Upgrade	Extension	Recurrent						
80	SAP Human Resources - Environment, Health, Safety & Incident Change	Extension	Recurrent						
Category Total				[c-i-c]					
Category: SAP Lifecycle Management									
82	SAP Lifecycle Management - Technical Improvements Provision	Extension	Recurrent						
84	SAP Data Volume Management Project	Extension	Non-Recurrent						
86	SAP Archiving Management Project	Extension	Non-Recurrent						
88	SAP - Retire Legacy Systems Management	Replacement	Recurrent						
90	SAP Licenses Growth	Extension	Recurrent						
92	SAP Lifecycle Management - ECC Enhancement Packs 8 & 9 (Replaces SAP Upgrades)	Extension	Recurrent						
94	SAP Lifecycle Management - Solution Manager Upgrade	Extension	Recurrent						
96	SAP Lifecycle Management - Functional Extensions and Upgrades	Extension	Recurrent						
98	JSAP Operations Alignment Project	Extension	Recurrent						
Category Total				[c-i-c]					

JEN EDPR IT Capex Plan				Direct Escalated Costs					
Project ID	Project Name	Extension or Replacement	Recurrent or Non-Recurrent	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
Category: Customer Systems									
100	Electricity Distribution Portal Redevelopment	Extension	Non-Recurrent						
102	Customer Relationship Management Project	Extension	Non-Recurrent						
104	Customer Relationship Management - Change Provision	Extension	Recurrent						
106	Customer Relationship Management - Licenses Growth	Extension	Recurrent						
108	Dial Before You Dig - Replacement Project	Replacement	Recurrent						
110	Dial Before You Dig - Upgrade	Extension	Recurrent						
112	Dial Before You Dig - Change Provision	Extension	Recurrent						
114	Dial Before You Dig - Licenses Growth	Extension	Recurrent						
116	Customer Engagement - Call Centre and IVR Applications Replacement	Replacement	Recurrent						
118	Customer Engagement - Multi Channel	Extension	Recurrent						
120	Customer Claims	Extension	Non-Recurrent						
122	Customer Lead to Opportunity	Extension	Non-Recurrent						
124	Customer Opportunity to Sales Order	Extension	Non-Recurrent						
Category Total				[c-i-c]					
Category: Outage Management (OMS) + Distribution Management (DMS) + Emergency									
126	Outage Management Systems Replacement - Blueprint	Replacement	Recurrent						
128	Outage Management Systems Replacement & Distribution Management Project	Replacement	Recurrent						
130	Outage & Distribution Management Systems - Change Provision	Extension	Recurrent						
132	Outage & Distribution Management System - Licenses Growth	Extension	Recurrent						
134	Integrity Monitoring Tools	Extension	Non-Recurrent						
136	Outage & Phase Identification Project & Tools	Extension	Non-Recurrent						
138	Demand Management Project	Extension	Non-Recurrent						
140	Demand Management - Change Provision	Extension	Recurrent						
142	Emergency Load Management Project	Extension	Non-Recurrent						
144	Relay Equipment Setting Information System - Provision for Change	Extension	Recurrent						
146	Emergency Management - Incident and Event Management	Extension	Recurrent						
148	Emergency Management - Mobile Satellite Communications	Extension	Non-Recurrent						
150	Emergency Management - Provision for Change	Extension	Recurrent						
152	Emergency Management - Upgrades	Extension	Recurrent						
154	Emergency Management - Replacement	Replacement	Recurrent						
Category Total				[c-i-c]					
Category: Business Intelligence, Reporting & Data Warehouse Systems									
156	Business Intelligence Project - Stage 1	Extension	Non-Recurrent						
158	Business Intelligence Project - Stage 2	Extension	Recurrent						
160	Business Intelligence - Change Provision	Extension	Recurrent						
162	Business Intelligence - Upgrade	Extension	Recurrent						
164	Business Intelligence - Licenses Growth	Extension	Recurrent						
166	Data Warehouse - Replacement	Replacement	Recurrent						
168	Data Warehouse - Change Provision	Extension	Recurrent						
170	Data Warehouse - Licenses Growth	Extension	Recurrent						
172	Data Warehouse - Upgrade	Extension	Recurrent						
174	Management Reporting - Change Provision	Extension	Recurrent						
Category Total				[c-i-c]					
Category: Document, Records & Content Management Systems									
176	Records and Document Management Replacement	Replacement	Recurrent						
178	Records and Document Management Provision for Change	Extension	Recurrent						
180	Records and Document Management - Systems Upgrades	Extension	Recurrent						
182	Records and Document Management Software Licenses-Growth	Extension	Recurrent						
184	Document Consolidation and Taxonomy Project	Extension	Non-Recurrent						
186	Document and Records - Archiving and Decommissioning Project	Replacement	Recurrent						
188	Drawings Management - Storage Systems Replacement	Replacement	Recurrent						
190	Drawings Management - Upgrade	Extension	Recurrent						
192	Information Management Project	Extension	Recurrent						
194	Information Management Tools - Provision for Growth	Extension	Recurrent						
196	Photographic Storage Tools - Change Provision	Extension	Recurrent						
Category Total				[c-i-c]					

JEN EDPR IT Capex Plan				Direct Escalated Costs					
Project ID	Project Name	Extension or Replacement	Recurrent or Non-Recurrent	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
Category: Geospatial Systems & Mapping & Asset Imaging									
198	Geospatial Information Systems - Upgrade	Extension	Recurrent						
200	Geospatial Information Systems - Change Provision	Extension	Recurrent						
202	Geospatial Information Systems - Licenses Growth	Extension	Recurrent						
204	Geospatial Information Systems - Systems Replacement	Replacement	Recurrent						
206	Common Information Model Project	Extension	Recurrent						
208	Geospatial Systems Extension to Communications Assets	Extension	Non-Recurrent						
210	High Voltage & SubTransmission Schematics Project - Stage 1 Build	Extension	Non-Recurrent						
212	High Voltage & SubTransmission Schematics Project - Stage 2 Data and Implementation	Extension	Non-Recurrent						
214	Geospatial Information Systems - Systems Integration for Mobility	Extension	Non-Recurrent						
216	Feature Manipulation Engine Tool	Extension	Non-Recurrent						
218	GIS to SAP Business Integrator Tool (Brought Forward to 2015)	Extension	Recurrent						
220	GIS Integration Tools for Design and Drawings	Extension	Non-Recurrent						
222	GIS Integration Tools - Upgrade	Extension	Recurrent						
224	Network Viewer Tools Upgrade	Extension	Recurrent						
226	Underground Network Model Tool and GIS Integration	Extension	Non-Recurrent						
228	Network Analysis Visualisation Tool & Implementation	Extension	Non-Recurrent						
230	Surveying Systems - Upgrade	Extension	Recurrent						
232	Aerial Imagery and LIDAR Tools - Change Provision	Extension	Recurrent						
234	Computer Aided Design - Autocad Upgrade	Extension	Recurrent						
Category Total				$933,011	$2,059,806	$611,241	$2,020,088	$3,448,676	$9,072,823
Category: Asset Construction & Field Services Systems									
236	Implement a New and Integrated Network Design Tool	Extension	Non-Recurrent						
238	Design Tool Upgrade	Extension	Recurrent						
240	Asset Inspection Tools - Upgrade	Extension	Recurrent						
242	Environment Management Replacement Project - SAP EH&S	Replacement	Recurrent						
244	Environment Management - Change Provision	Extension	Recurrent						
246	SAP Works Management - Change Provision	Extension	Recurrent						
248	Program and Portfolio Management SAP PPM Project	Extension	Non-Recurrent						
250	SAP PPM - Upgrade	Extension	Recurrent						
252	SAP PPM - Change Provision	Extension	Recurrent						
254	SAP PPM - License Growth	Extension	Recurrent						
256	SAP Project Management Accounting - Enhancement	Extension	Recurrent						
258	SAP Project Management Accounting - Change Provision	Extension	Recurrent						
260	Field Mobility Project - Stage 1 Blueprint & Business Case	Extension	Non-Recurrent						
262	Field Mobility Project - Stage 2 Inspections and Works Management	Extension	Non-Recurrent						
264	Field Mobility Project - Stage 3 Implementation & Completion	Extension	Non-Recurrent						
266	Field Mobility Project - Change Provision	Extension	Recurrent						
268	Field Mobility Project - Upgrade	Extension	Recurrent						
270	Field Mobility Project - Growth	Extension	Recurrent						
272	Field Mobility Project - Communications & Truck Hot Spots	Extension	Non-Recurrent						
Category Total				$3,351,879	$3,901,206	$1,322,071	$626,060	$1,166,876	$10,368,091

[c-i-c]

[c-i-c]

JEN EDPR IT Capex Plan				Direct Escalated Costs					
Project ID	Project Name	Extension or Replacement	Recurrent or Non-Recurrent	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	EDPR 2016-2020 Total
Category: IT Infrastructure (Lifecycle Upgrades, Replacement & Retirement)									
274	Data Storage & Management - Lifecycle Management	Replacement	Recurrent						
276	Platforms & Processing - Lifecycle Management	Replacement	Recurrent						
278	End User Services - Lifecycle Management	Replacement	Recurrent						
280	Security Services - Lifecycle Management	Extension	Recurrent						
282	Systems Management & Operations - Lifecycle Management	Extension	Recurrent						
284	Communications & Network Services - Lifecycle Management	Replacement	Recurrent						
286	Facilities & Data Centres	Extension	Recurrent						
288	Data Centres Expansion/Growth	Extension	Recurrent						
290	Organic Growth	Extension	Recurrent						
292	Platforms & Data Storage Growth	Extension	Recurrent						
294	Data Warehouse Growth Above Natural Growth	Extension	Recurrent						
296	New Capability Systems Growth	Extension	Recurrent						
298	Projects Office Accommodation	Extension	Recurrent						
300	Less - SCADA & RTS IT Infrastructure Lifecycle Management	Replacement	Recurrent						
Category Total				[c-i-c]					
Category: Metering - Standard Control Systems Metering									
302	Software Application Upgrade - NMS (SCS)	Extension	Recurrent						
304	Software Application Upgrade - MDM	Extension	Recurrent						
306	Software Application Upgrade & Merge the 2 SAP Systems	Extension	Recurrent						
308	Software Application Upgrade - ESB/B2B	Extension	Recurrent						
310	Provision for ongoing development	Extension	Recurrent						
312	Metering Systems Growth - Licenses	Extension	Recurrent						
314	Replace the legacy CIS+ metering systems	Extension	Recurrent						
Category Total				[c-i-c]					
Category: Metering - Ongoing Advanced Metering for Contestability									
316	Contestable Metering - NB: Moved to "Pass Through"	Extension	Non-Recurrent						
318	Solution Changes for the Contestable Market	Extension	Recurrent						
320	Software Application Upgrade - NMS (ACS)	Extension	Recurrent						
322	Growth - Customer Connections & Network Growth	Extension	Recurrent						
Category Total				[c-i-c]					
Total				**$21,360,356**	**$22,978,343**	**$22,279,089**	**$18,444,941**	**$18,747,049**	**$103,809,778**
Category Total				**$5,486,978**	**$7,212,198**	**$8,011,936**	**$3,301,856**	**$2,942,948**	**$26,955,915**
Category Total				**$321,842**	**$799,038**	**$328,886**	**$2,205,594**	**$4,221,204**	**$7,876,564**
Category Total				**$7,368**	**$7,279**	**$167,276**	**$169,668**	**$2,078,303**	**$2,429,893**

Appendix B
IT PROGRAM DELIVERABILITY REPORT

Jemena

B1. IT PROGRAM DELIVERABILITY REPORT

B1.1 SUMMARY

Jemena IT considers the program of work for the planning horizon, which covers all of Jemena's business activities, to be prudent, efficient and realisable.

It is prudent because the need to maintain IT systems and deliver new functionality to meet future requirements is a necessary part of fulfilling JEN's obligations as a DNSP. Each project in the IT AMP either focusses on sustaining the current systems or is driven by the need to keep pace with the changing environment for managing networks.

It is efficient because it follows a clear strategy of bedding in existing systems, a policy of moving towards commodity based, industry standard platforms and maintains a focus on maximising benefit from previous investments. It also leverages the synergies between Jemena's various business entities providing economies-of-scale benefits to JEN from the use of common systems and platforms.

Our level of confidence that it is an achievable program of work is founded upon the following:

- Jemena's history of successful IT project deployment.
- The completion of all the planned activities for the previous EPDR and AA periods, noting the exceptions for projects which were deliberately deferred for sound business reasons.
- The completion of the AMI CROIC program within JEN which represented a substantial increase in workload over historical IT project activity levels.
- Comparable expenditure to previous periods on a purely budgetary measure once AMI costs are factored in.
- Comparable or reduced complexity for projects in the planning horizon compared to previous periods of successful delivery.
- Comparable or lower business change impacts for the projects in the planning horizon compared to previous periods.
- Jemena's long-standing practice of calling upon external contract labour for IT project work providing access to a large pool of resources which is "elastic" 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. Variety within the project mix ensures that the workload for key IT personnel and for the business Subject Matter Experts (SMEs) who participate in projects is spread out across the business and over the planning horizon.

B1.2 COST COMPARISON

In comparing the size of the program as a whole to previous periods it is common to view it from the perspective of total cost.

However, using budget amount as an indicator is only a crude approximation of the level of complexity of a project and the reliance it may have on key/limited resources. For example, the capital proportion spent on licensing, hardware et al. is highly variable from project to project.

Having said this, JIT do use overall budget as a rough measure to help level out the workload and moderate resource contention. As such, the program of work for the whole of Jemena, encompassing the regulatory submissions for both JEN and JGN, has actively been structured to evenly spread the activities over the planning horizon where possible.

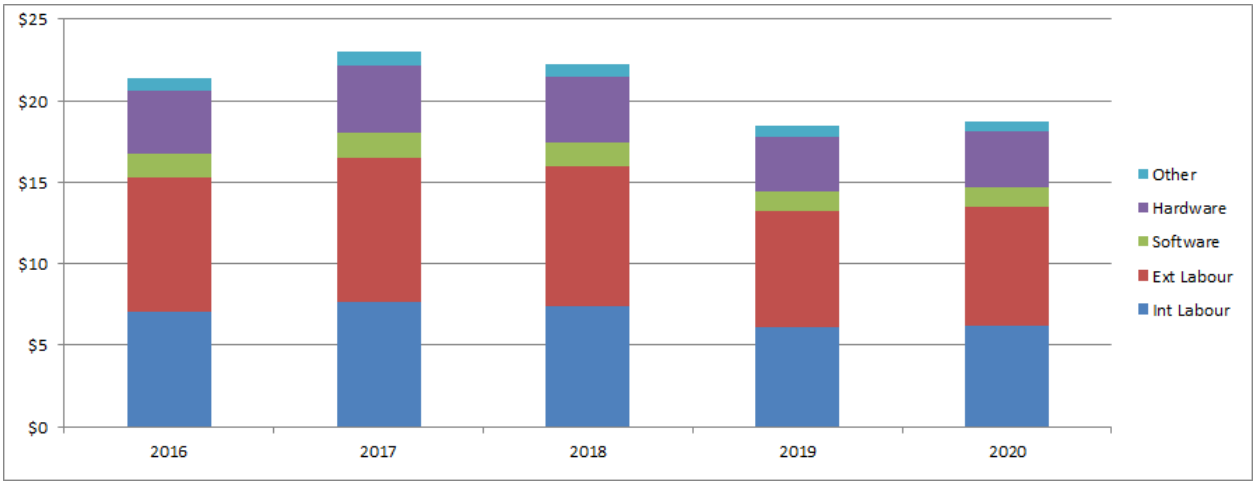
When removing consideration of the activities associated with the finalisation of the SAP consolidation projects, which are almost wholly outsourced, the plan ensures that the range of capital work undertaken by JIT in any given year falls between $35M and $50M. History has shown that this is a realisable band of activity for a 12-month period.

The following waterfall representation shows the progression from previous IT programs of work for JEN with the addition of the highly specialised projects for mobility and the replacement of the OMS/DMS systems compared against the current submission.

Costs in Real 2015 $M

This demonstrates that the base program of work is of a comparable size to the previous period for the core activities.

The graph below shows the expenditure on a per annum basis for JEN split by internal/external labour, software, hardware and other.



Where the largest single cost – external labour, is subject to full competitive evaluation, either via specific tender or through a competitive panel of suppliers.

Internal labour utilisation is higher in the first 2 years for JEN, as the next EDPR commences, reflecting a greater proportion of time devoted to projects which then becomes capitalised. The majority of hardware investments accompany the infrastructure program with the applications systems increasingly sharing common platforms.

The shape of this profile for JEN is consistent with previous periods. Given this, and the variety of project activities in the program of work, Jemena IT believes that the program will demand no more than the normal level of resource balancing and project management than has historically been required.

B1.3 DELIVERY CONSTRAINTS

Assuming the availability of funding and the approval of business cases, there are 5 substantive constraints on Jemena's ability to successfully implement IT projects:

- Subject Matter Expertise – the availability of SMEs from within the business to specify requirements, provide technical guidance and to assist in testing.
- Technical Expertise – the availability of specialised IT personnel to perform the technical aspects of the individual projects.
- Business Flexibility – the capacity within the organisation to adopt change; be it through process reengineering or organisational restructures resulting from IT systems implementation.
- Governance & Support – the availability of project management and project office resources to run the projects and the access to key decision makers to provide the proper oversight surrounding the program of work.
- Infrastructure – The availability of the requisite hardware for production, pre-production and development environments required during the implementation and post go-live.

B1.4 SME AVAILABILITY

The upcoming program of work has considerable variety in its scope and footprint across the business. In fact, when considering the focus on Advanced Metering Infrastructure and its related impacts upon other systems in the previous period, the planning horizon contains a greater mix of activities than before.

This variety of projects leads to a wider and more diverse pool of SMEs throughout the business which need to be called upon to assist with project activity and a reduced business impact accordingly.

Specifically, we note that the following major project groups are almost entirely compartmentalised within their business functions and hence have minimal overlap with each other and with "Corporate" projects when it comes to sourcing skilled business resources:

- Infrastructure lifecycle replacement (the largest single grouping which incorporates a continuous, ongoing level of refresh).
- SCADA and Real Time Systems.
- OMS & DMS replacement.

- Geospatial Information Systems.
- Mobility systems deployment.

The allocations for projects in these specialties represent a substantial proportion of the overall program of work for the planning horizon.

In addition to this, Jemena now has access to more sophisticated tools for automated testing which reduces the reliance on SMEs during deployment.

Given this greater diversity of activity in the forthcoming period, the risk of SME constraints affecting the deployment of projects is considered to be less than in the previous period and that there are sufficient opportunities for mitigation should challenges arise.

B1.5 PROJECT RESOURCE AVAILABILITY

As noted previously, IT projects involve a diverse mix of specialist skills depending on the subject matter involved. For this reason, skilled technical resources are frequently sourced, as and when required, from the broader market pool for the period of major project activities and returned to the market when the project is delivered.

As a result, long term, dedicated staff within Jemena IT are generally associated with ongoing activities where there is a consistent workload such as:

- Infrastructure support (including ongoing refresh).
- End user support.
- IT Strategy & Architecture.
- Administration.
- Program Management and project support.

And even in some of these disciplines, contract labour is routinely used to provide elastic resourcing to meet peaks and troughs.

Jemena's ratio of internal to external, contract based staff depends on the nature of the project ranging from a 15% / 85% ratio on complex applications where highly specialised skills are required coming down to a ratio of 50% / 50% on more standardised and recurrent projects such as infrastructure upgrades, client device updates, etc.

This model for IT project work is now common in the modern business environment, regardless of the in-sourcing or out-sourcing of core IT services, and Jemena is not unique in sourcing the majority of IT project resources on an as-needs basis. The alternative of retaining skilled staff through periods of low activity is both inefficient for the business and unfulfilling for the staff.

Jemena has every reason to believe that this long-established, and highly-scalable, mechanism for resourcing projects will fulfil the need for project skills for the initiatives proposed in the planning horizon.

B1.6 BUSINESS CHANGE ADOPTION

The capacity within the organisation to adopt change, be it through process reengineering or organisational restructure resulting from IT systems implementation is complex to measure; nevertheless, the following attributes provide some degree of confidence that the upcoming period has a sustainable level of business impact:

- Jemena enjoys a high level of employee engagement. A positive attitude and a high level of resilience amongst the workforce are closely correlated with successful business change initiatives.
- Major, substantive change deriving from the IT initiatives around the SAP consolidation and AMI implementation projects are now behind us and the current planning horizon does not contain projects with the same level of imposed system change upon work practices.
- Mobility, on the other hand, is an area which is being enthusiastically adopted by staff and initial trials are showing that benefits are achievable through “common sense” adoption and work practices rather than imposed business process reengineering approaches.
- Specialised project areas such as GIS and SCADA are also examples of initiatives where there is a small pool of staff affected by the changes and who are highly motivated to see new technologies adopted.

For the coming period, projects in the IT program which involve new functionality and business change have been entirely driven by requests from the business for specific improvement initiatives. This significantly improves the success rate for projects and the realisation of benefits.

In summary, when comparing the upcoming period against the previous one, Jemena’s program of work for the planning horizon is one of consolidation and bedding in of the initiatives that have recently been deployed. It will be a period of driving through and delivering on the business benefits that we expect to see from past programs. This is entirely in accord with the Jemena IT Strategy on consolidating systems and leveraging previous investments.

B1.7 PROJECT GOVERNANCE

Jemena uses best practice processes in IT strategy development and project delivery and governance as detailed in the relevant sections of the IT AMP body. These established practices will continue to be applied and further refined upon into the future.

From a workload perspective, the program for Jemena IT through to 2020 contains a comparable number of projects and project durations to previous periods. As such, present availability levels of resourcing for project leadership and support resources, both internally and externally sourced, are considered to be sufficient for the upcoming period and are unlikely to require other than conventional, historically-applied approaches to sourcing such resources.

Additionally, the amount of required key decision-makers’ time involved in oversight of the program of work is not increased upon that which has been necessary in the past.

As such, the risk of these factors constraining the ability of JIT to successfully implement the program of work is considered low and accompanied by a range of mitigating factors available to the business to address any challenges that might arise.

B1.8 INFRASTRUCTURE AVAILABILITY

The availability of hardware for the production and pre-production environments required for the development and implementation of systems is becoming far less of a constraint than it has historically.

Through a deliberate strategy, Jemena's IT infrastructure is becoming increasingly commoditised with standard, industry dominant operating systems and platforms in use. Access to additional capacity has never been easier to acquire quickly.

Ongoing advances in technology also continues to ensure that increased capacity becomes available at reduced cost and we expect this trend to continue for the planning horizon.

Additionally, increasingly sophisticated technologies for virtualising processing and storage capacity and the ability to adjust resource allocation on-the-fly between virtualised application environments means that such constraints are becoming far easier to manage.

Likewise, network capacity for data communications is being continually monitored and enhanced where required to keep pace with the data needs of the business.

Jemena does not believe that constraints in available IT infrastructure will at all impede the ability to deliver on the IT program of work.

B1.9 PROJECT DELIVERY EFFICIENCY

Jemena IT uses the following strategies to ensure efficiency in the resourcing and deployment of IT initiatives:

- Using external resources for key skills which are used on a cyclical basis with large variation in requirements between periods of major upgrade/replacements and general ongoing maintenance. The alternative of having suitable resources on permanent staff would inevitably result in down time for staff when between major activities.
- Utilising a portfolio delivery model for IT initiatives across the whole of Jemena.
- Maintaining a mix of projects within a given period to spread workload across the organisation.
- Using competitive tender and competitively sourced panels of suppliers for technical resourcing.
- Leveraging the shared nature of many of our Corporate systems across all of Jemena.
- Using common infrastructure platforms across applications and business units.
- Having long standing commercial supply contracts in place for the cost effective provision of equipment, software and telecoms services.
- Active planning of the workload to minimise business impacts and constraints on delivery.
- Using best practice IT governance methodologies including a combination of Agile software development principles and PRINCE2® project management.
- Use of automated testing tools and regression testing to improve system reliability and reduce deployment cycle times.