Document No. D13/446348

AER 2014-19 Technology Capital Expenditure Plan Overview

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Glossary

Name	Description
Alcatel	The telephony system including the PABX and desk phone sets.
ARC	Call centre online help. Web-based portal
AutoCAD	Design & drafting platform
B2B Browser & Gateway	Processing of B2B transactions - E-Hub, Systems & databases, B2B Service Orders. B2B Forms + B2B Server
BALIN (Engineering Information Index)	Balin is Ausgrid's Engineering Information Index. It contains engineering policies, standards and guidelines as well as reference material and links to other systems.
CBA Diamond Services / Commbiz	Data retrieval system to monitor bank accounts within CBA. (not to be confused with micro treasury) Diamond Services Individual Funds Movement
Complete Human Resource Information System (CHRIS21)	Maintains personnel, payroll, position control, training & development, recruitment, Occupational Health & Safety details about employees.
Computer Aided Service System (CASS)	CASS is a despatching and mobile computing application that enables the electronic issue of customer premise jobs to the field, such as reconnect orders and single premise outage jobs. The jobs are updated and completed in a CASS mobile solution in the field and updates on the progress of these jobs are available in CASS and the Outage Management System (OMS) via an interface. It is used primarily by System Control's Despatch sections and Emergency Service Operators (EMSOs).
Dereg- Billing	Generates the Billing information for TCA Clients based on the Dereg Data.
Dial before You Dig	A "One Stop Shop" service to supply information about buried cables, pipes, conduits, etc. so that they can be avoided during excavation work and not damaged.
Disconnect & Reconnect Order System (DAROS)	Requests for disconnects, reconnects, alterations to electricity network.
Distribution Network Management System (DNMS)	The Distribution Network Management System / Distribution Management System (DNMS/DMS) is an advanced SCADA system used by Ausgrid control rooms to monitor and control the electrical network.
Distribution Performance Reporting and Billing System (DPBRS)	Provides job, Performance, Utilisation Reports of the Operation as well as billing Base.
Primavera	Primavera System is Ausgrid's Project Management System. It is used by staff across divisions, and Office of the CIO to manage projects and critical resources.
External Website	The Ausgrid website is hosted by Safecom, an external vendor.
EA Gateway	The EA gateway is a service for file transfers both internal and external.

Name	Description
Finance - Management Reports	The System generates high level management reports based on the Dereg Data.
FigFleet	FigFleet is a Progress database used by Fleet Management at Ausgrid. The system contains details of all vehicles and plant including allocation of units, fuel transactions, service and repair details, tyres and fringe benefits tax details. FigFleet provides financial transactions including depreciation of fleet assets and billing details, all of which are interfaced with SAP. The system is used extensively by the Fleet Management group to manage Ausgrid's fleet of over 4000 vehicles and plant.
Fleet Management System	Manages fleet leasing business.
General Load System	Analyses and forecasts system loads for system planning. (merge SCADA and Transgrid data).
Genesys	A system used in the contact centre to route calls to call agents.
Geographical Information System (GIS)	The corporate Geographic Information System details spatial information for EA's field assets.
InfoSpan	ANZ Purchase Card Software. Maintains Details of Purchases made with Visa Cards (.psr files).
Ingrian DataSecure Appliance	Ingrian appliances encrypt data on various hardware (e.g. servers) to provide an increased level of security
Itron Enterprise Edition	A repository of interval meter configurations (standing data) for which Ausgrid fulfils the Meter Data Provider role on the national market.
KnowRisk (OT&I Risk Repository)	A Thick Client/Server app used for the tracking and management of Cyber Security risks.
Lotus Notes Client	Email messaging, RSS feeds, Instant Messaging, document and file sharing (through add-on products).
Meter Configuration System	The Meter Configuration System is an Intranet based front-end application that supports the creation, amendment, and removal of meter configurations.
Meter Data Warehouse	The Meter Data Warehouse is a database that extracts meter reading data from Nemstar and Metering Business System (MBS) for analytics and report queries from business stakeholders.
Metering Business System	The Metering Business System (MBS) supports the network metering requirements of the Australian contestable energy market and provides a comprehensive suite of functions for the management of Meter Reading, Meter Provision, Meter Data Provider and Network services.
Mobile Asset Management	The SAP MAM application is a full offline mobile application that assists the field service and the field maintenance technicians to perform their daily activities within plants with all the needed data synchronized onto their handheld devices from the SAP backend system.
Multi Vendor Reading System	Electronic meter reading system for remote (ERT) meter reading.
nemSTAR	National Electricity Market STAR: Meter Data Agent's load profile storage system. Used for creating reports for the National Electricity Market and MDA customers.
NICE - Record On Demand (ROD)	Voice recording application for the Call Centre.
Outage Management System	The Outage Management System (OMS) is a computing application that

Name	Description
(OMS)	predicts network fault locations based on a combination of customer outage calls and network device operations. This system is used across Ausgrid at the time of an outage to process customer outage calls, provide feedback to customers for known outages, and to assist with managing outage identification and restoration. Data sourced from OMS is used by claims groups to process any customer claims resulting from outages and also for internal and external regulatory reliability reporting. Primary users of OMS and OMS data include the Contact Centre, Control Room, Despatch, Field Services, Network Security, Network Reliability and Network Claims.
Physical Network Inventory (PNI)	Geographic Information System used to model the Physical Network Inventory for Communications.
Property Management Information System (PMIS)	The Property Management Information System (PMIS) records and maintains information relating to Ausgrid's property portfolio, including; floor space areas, easements, associated leases, licences and service contracts. It also has a job tracking facility in relation to property acquisitions, easement and leases. PMIS captures operating costs by individual property, billing of external tenants and it has a comprehensive suite of standard reports. It is integrated with the OneCall Lotus Notes system used by the Contact Centre to capture internal and external requests regarding building maintenance issues. The system has a flexible search engine providing the capacity to search by any reference number, land title information, address, property name, usage, local government area. The relevant PMIS reference number is cross referenced with the asset number recorded in SAP for all Ausgrid-owned properties. PMIS has the functionality to capture billing file data from Sydney Water, Hunter Water and OSR for Land Tax, including consumption data for water and electricity usage for individual properties.
SAP	SAP is our company-wide information management system that includes financial, procurement, project, scheduling, asset management, customer and HR data.
SAS	SAS portal is a website from which staff can access the following applications: - General Load System (Genload): reporting of feeder and transformer loads at sub-transmission, zone and distribution levels. - Loadcycle: load cycles and peak loads for sub-transmission and zone transformers. - Protection Grading (a.k.a Grade): analysis of system protection to achieve safe fault clearing times. - TIS Query & Reporting: legacy reports against the Network Reporting Database.
SCADA	The Supervisory Control and Data Acquisition (SCADA) system is used by Ausgrid control rooms to remotely monitor and control the electrical network. The historical data gathered by the SCADA system is used by staff for electrical

Name	Description
	network investigations and reporting.
SEQOS	System to support warehouse-control picking & put away process.
SharePoint	SharePoint is a Microsoft application. It is a browser-based platform that can deliver a range of solutions, such as intranet portals, websites, document and file management, collaboration spaces, and process information. At Ausgrid SharePoint is used to deliver The Wire and a number of team file sharing and collaboration sites, called InfoShare.
SINCAL	An application developed by Siemens Austria that allows a user to construct a model of an electrical network. Using a system called Electricity Supply Network Planning (ESNP), Distribution Planning Systems (DPS) are able to automatically build a zone model of any Ausgrid distribution network. Two of the functions provided by ESNP are the ability to automatically produce a schematic layout of a Sincal zone model and perform a number of network analysis tasks, such as seasonal load analysis.
TDMS	The Technical Documents Management System (TDMS) is a web based document repository of engineering information.
TIBCO	A middleware platform for integrating applications.
TM1	Business unit and corporate reporting and budgeting models.
TRIM / REX	TRIM is Ausgrid's corporate Electronic Document and Records Management System. It provides records management capability for physical and electronic business records and information. TRIM is designed to provide Ausgrid with the ability to capture, manage, and secure business information in order to support day to day business operations and meet governance and regulatory compliance obligations.

Executive Summary

We are proposing a total Capex of $207 million ($ 2013/14)[1] for our Technology Plan in the 2014-19 period. We have carefully prioritised our investment program to achieve a 47 per cent reduction from the 2009-14 regulatory determination in order to meet our objective of keeping customer prices below CPI whilst maintaining the technology assets in a prudent and efficient manner to ensure the ongoing reliability, security and sustainability of supply to our network customers.

The purpose of this document is to provide an overview of the proposed Capital Expenditure (Capex) within the Technology Plan for the 2014-19 regulatory period. The Technology Plan outlines the Capex forecasts required to meet our obligations as an efficient Distribution Network Service Provider (DNSP) for the following categories:

- Non-network Information Technology (IT) & communications for the delivery of Standard Control Services;
- Non-network SCADA & network control systems for the delivery of Standard Control Services; and
- Alternate Control Services (such as Type 5 and 6 Meters and its supporting systems).

We have proposed a total Capex of $207 million ($ 2013/14)[1] in the 2014-19 regulatory period. This represents a 47 per cent reduction from the 2009-14 regulatory determination. Table 1a. provides a breakdown of the Capex between non-network IT & communications, SCADA & network control and Alternate Control Services by financial year.

Capex ($ 2013/14)[1]	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Non-Network Capex:						
- IT & Communications	22,407,176	21,226,483	27,303,700	29,731,689	23,930,053	124,599,100
- SCADA & Network Control	16,918,475	13,421,506	10,813,053	12,080,919	14,054,009	67,287,961
Direct Metering IT Capex	4,109,094	2,592,625	4,827,050	2,031,015	1,917,042	15,476,826
Total Technology Capex	43,434,745	37,240,613	42,943,803	43,843,623	39,901,104	207,363,888

Table 1a: Proposed technology Capex ($ 13/14)

As required by the Regulatory Information Notice Under Division 4 of Part 3 of the National Electricity (New South Wales) Law (RIN), Table 1b. provides a breakdown of Capex between Client device, Recurrent and Non-recurrent expenditure (as defined in the RIN) by financial year for Non-Network IT & Communications Capex only.

[1] This is total Ausgrid capital requirement prior to the application of the Cost Allocation Methodology (CAM) to separate assets that 'share' with other regulated and unregulated services. Please refer to Table 1c and 1d for a regulatory separation of services.

Non-network IT & Comms Capex ($ 13/14)[1]	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Client device expenditure	1,044,576	301,067	303,502	1,877,810	1,707,009	5,233,964
Non-recurrent expenditure	3,969,689	1,308,527	2,181,638	6,917,926	-	14,377,780
Recurrent expenditure	17,392,911	19,616,889	24,818,560	20,935,953	22,223,044	104,987,356
Total Technology Capex	22,407,176	21,226,483	27,303,700	29,731,689	23,930,053	124,599,100

Table 1b: Proposed Technology Non-network IT & Communications Capex by expenditure category ($ 13/14)

Table 1c provides a breakdown of total technology Capex between different regulated and unregulated services.

Capex ($ million, 13/14)	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Standard Control Service						
- IT & Communications	20.2	19.4	25.0	27.1	21.9	113.7
- SCADA & Network Control	17.0	13.5	10.8	12.1	14.0	67.3
Alternate Control Services	4.5	3.0	5.3	2.5	2.3	17.7
Public Lighting	0.4	0.4	0.5	0.5	0.4	2.2
Unregulated	1.4	1.1	1.4	1.5	1.2	6.5
Total Technology Capex	43.4	37.2	43.0	43.7	39.9	207.4

Table 1c: Proposed technology Capex by regulated and unregulated services ($ million 13/14)

Table 1d provides the proposed technology Capex for standard control service that align with Chapter 5 of the Capex proposal.

Standard Control Service Capex ($ million, 13/14)	2014/15	2015/16	2016/17	2017/18	2018/19	Total
IT & Communications	20.2	19.4	25.0	27.1	21.9	113.7
SCADA & Network Control	17.0	13.5	10.8	12.1	14.0	67.3
Broadbase Demand Management[2]	0.8	0.1	0.2	0.1	0.1	1.4
Total Standard Control Service Capex	38.0	33.0	36.0	39.3	36.1	182.3

Table 1d: Proposed technology Capex for standard control service ($ million 13/14)

Meeting the network business objectives

The IT & communications and SCADA & network control technology assets are integral to key network and corporate functions such as Asset Lifecycle Management, Asset Operations, Customer and Market Management and Financial Reporting. The Technology Plan seeks the prudent and efficient management of technology to enable Ausgrid to achieve the network business objectives of:

[2] Capital requirements associated with broadbase demand management are covered in a separate supporting document

- Price – striving to contain our share of customers' electricity bill increases at or below the Consumer Price Index (CPI); and
- Reliability – Ensuring the ongoing reliability, security and sustainability of the network.

The Technology Capex Plan meets the network business 'Price' objective by forecasting a 47 per cent decrease in Capex for the 2014-19 regulatory control period in comparison to the AER determination for 2009-14. This was achieved by applying a detailed forecasting methodology and rigorous governance process to assess the prudency and efficiency of the projects and then prioritise the capital program, thereby reducing Capex from an initial estimate of $290 million to $207 million ($ 13/14).

The majority of the Technology Capex (around 88 per cent of Technology Capex) relates to the maintenance of existing technology assets to ensure continued reliability and security of the network (such as recurrent infrastructure maintenance, mandatory application patch management).

The current regulatory period (2009-14)

The current 2009-14 regulatory period has been characterised by high levels of investment in technology after a period of under investment. In this period, we were seeking to consolidate our system infrastructure and introduce new technologies to replace ageing business critical systems. Table 1e. details the 2009-14 AER determination for Technology:

2009-14 AER determination ($ million, nominal)	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Non-Network Capex:						
- IT & Communications	79.4	48.1	37.3	39.2	32.9	**236.9**
- SCADA & Network Control	26.5	27.5	51.2	25.7	10.3	**141.1**
TOTAL AER determination	**105.9**	**75.6**	**88.5**	**64.9**	**43.2**	**378.0**

Table 1e: Proposed technology Capex ($ million, nominal)

Key outcomes from the 2009-14 investment include:

- Consolidating legacy systems across Finance, Logistics, Customer Management, Business Intelligence, Asset Lifecycle, Asset Management, Works Management and Human Resources (HR) into an SAP Enterprise Resource Platform (ERP);
- Replaced ageing IT & communications systems with new technology to reduce risks profile of Ausgrid, such as Mass Call Platform, Metering Business Systems, Enterprise Mobile Asset Management System;
- Investment in the SCADA and network control systems to better capture data for business decision making, automation of the network to increase productivity and improve response times to reliability incidents; and
- Participation in the *Smart Grid, Smart City* project with the Australian Commonwealth Government to explore the cost effectiveness of smart technologies to provide customers with lower cost and more reliable service.

The investment made in the current regulatory period set the foundation for Ausgrid's technology platform. This has enabled the 40 per cent reduction in the 2014-19 regulatory period from the 2009-14 AER determination, without increasing Ausgrid's risk profile.

Network Reform Program

On 1 July 2012, the Networks NSW (NNSW) operating model commenced with Endeavour Energy, Ausgrid and Essential Energy having a common Boards of Directors, a common Chairman and common Chief Executive Officer.

NNSW has a direct focus on identifying and driving efficiencies in the operations of the network businesses. The key focus areas of Network NSW generated reform include:

- New operating model initiatives. These relate to streamlining both corporate and support services, removing functional duplication within, and sharing better practices between the three companies.
- Capital expenditure efficiency initiatives. These relate to improved capital management across the three distributors in relation to expenditure on the network, as well as on fleet, property, and technology.
- Strategy and policy initiatives. These relate to policy changes for consistent better practice across the three distributors, particularly in network areas, such as reliability planning, maintenance and renewal policies, fleet strategy and property portfolio management. In each case, significant operational business change will be required to achieve both operational and capital expenditure benefits.
- Procurement and Logistic initiatives. These will create repeatable, auditable, controlled and faster sourcing processes that will drive significant procurement savings across a number of product and service categories.

Since 2012, the industry reform has significantly changed Ausgrid's operational focus. We have reviewed our strategies and policies, reprioritised its capital programs and reduced operational spending through management of overheads and tightening of Enterprise Bargain Agreement negotiations. The aim is to find cost efficiencies and expenditure deferrals to minimise price impacts, whilst not impacting on the safety of our people, customers and on the overall reliability of the electricity network.

The next regulatory period (2014-19)

The 2014-19 period marks a significant change in our business landscape. With the technology investments made in 2009-14 and NNSW's focused on keeping prices below CPI, this has resulted in a significant reduction in our proposed total Capex in 2014-19 from an initial estimate of $290 million to $207 million ($ real 13/14). The proposed Technology Capex Plan largely represents a program of maintaining the existing Technology assets in an efficient and prudent manner to continue to meet the current customer service levels as a Distributed Network Service Provider (DNSP). This has been achieved by:

- Looking at opportunities to defer the timing of maintenance and replacement of systems;
- Looking at ways to provide technology at a lower cost, including opportunities to utilise alternative delivery models, such as 'infrastructure as a service' and other outsourcing models;
- Taking a more cautious approach to adopting new and innovative operational technology; and
- Looking at strategic initiatives which reduce risk and create operational efficiencies and narrowing the suite of efficiency projects to those with short payback periods in terms of efficiency benefits in the 2014-19 period.

A conceptual view of the Technology Plan by domain is depicted in Figure 1.

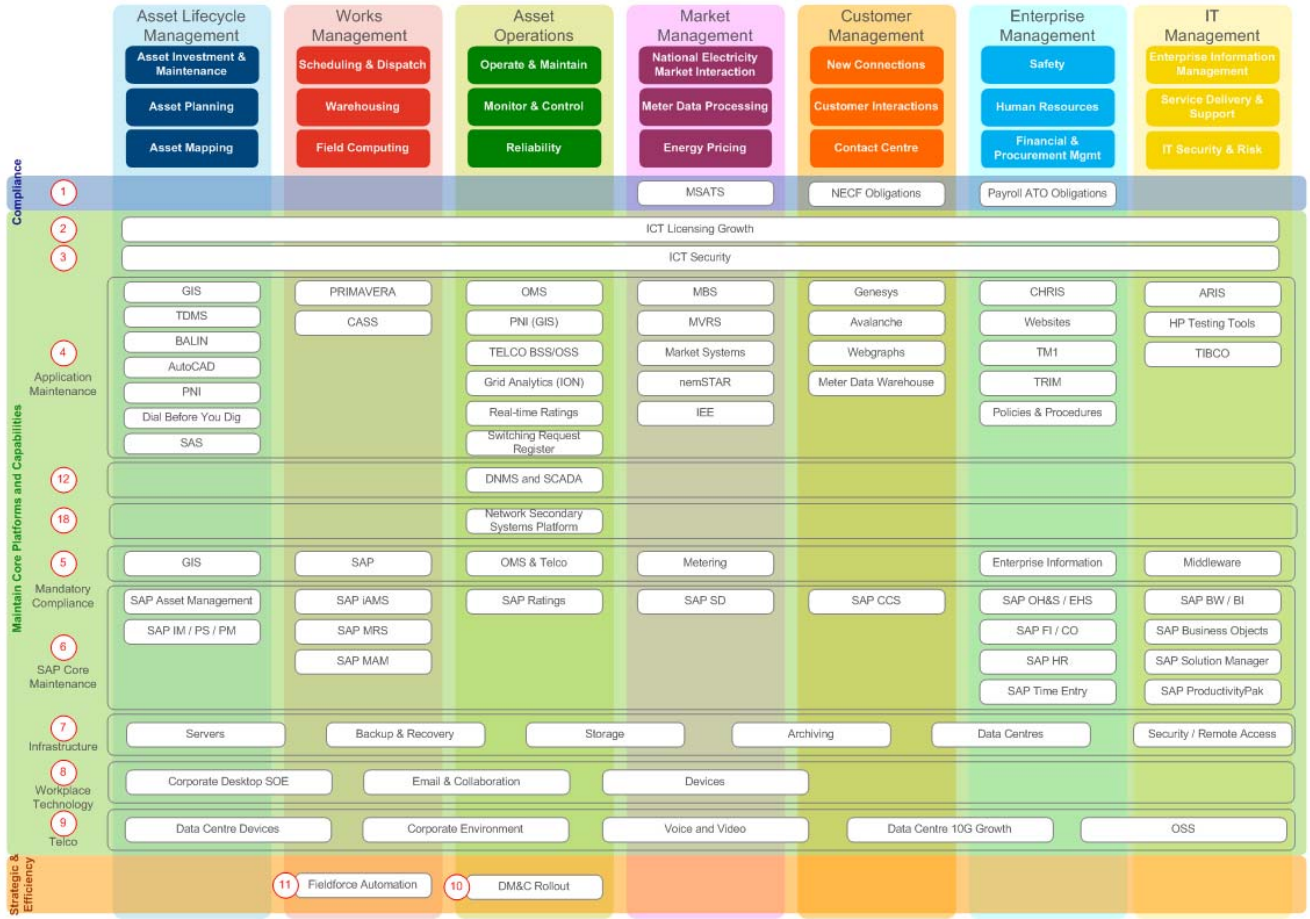

Figure 1: Technology Plan conceptual view

Introduction

IT & communications and SCADA & network control systems provide critical support for the key activities we are required to perform in our role as a Distributed Network Service Provider (DNSP).

The purpose of this document is to provide a high level overview of capex we propose to invest in the 2014-19 period, under the Technology Plan. This document is part of Ausgrid's regulatory proposal and contains the proposed forecast capex for the Technology Plan, expressed in 2013/14 dollar terms, unless stated otherwise.

The document should be read in conjunction with other relevant attachments and documents provided in the 'supporting document' library of Ausgrid's regulatory proposal (support documents). These supporting documents are generally business-as-usual documents and we have provided these for the main objective of demonstrating that our investment decisions are efficient and robust. It must however, be noted that these supporting documents have been prepared at a point in time and therefore reflects the forecast capex as at that time.

In the sections below we describe how IT & communications and SCADA & network control systems are instrumental in fulfilling our role as a Distributed Network Service Provider (DNSP). We also describe the key types of assets included in the technology plan, and the underlying principles governing our investment strategies.

Why does a DNSP require technology?

ICT provides critical business support to meet our obligations as a DNSP. In the absence of technology we would not be able to operate our current network, undertake effective planning of the network, or fulfil our corporate obligations. In the sections below we identify 2 reasons for using technology at Ausgrid:

- IT & communications and SCADA & network control systems are instrumental to perform our network and corporate functions such as asset management, customer management, and financial reporting.
- Prudently adopting technology enables us to deliver better services to our customers at a lower cost over time.

Support for network and corporate functions

IT & communications and SCADA & network control systems underscore the functions and activities we are required to perform as a DNSP.

We adopted the Energy Industry Model (eIM) framework developed by Australian Energy Marketing Operator (AEMO) to categorise how technology is used to support our critical activities. The AEMO categorisation allows for a common way of describing the support provided to the business. The model identifies two broad categories of technology support.

- Energy specific domains– We have a number of technology services which specifically relate to the core activities of an electricity service provider.
- General domains – We also have assets which provide support to general corporate functions such as finance and HR.

Figure 2. describes the six domains in the AEMO framework including Asset Management, Workforce Management, Customer Management, Market Management, Enterprise Management and IT Management. As noted in section 1.2, our systems will often span across multiple business functions, with infrastructure providing the underlying support to power these systems.

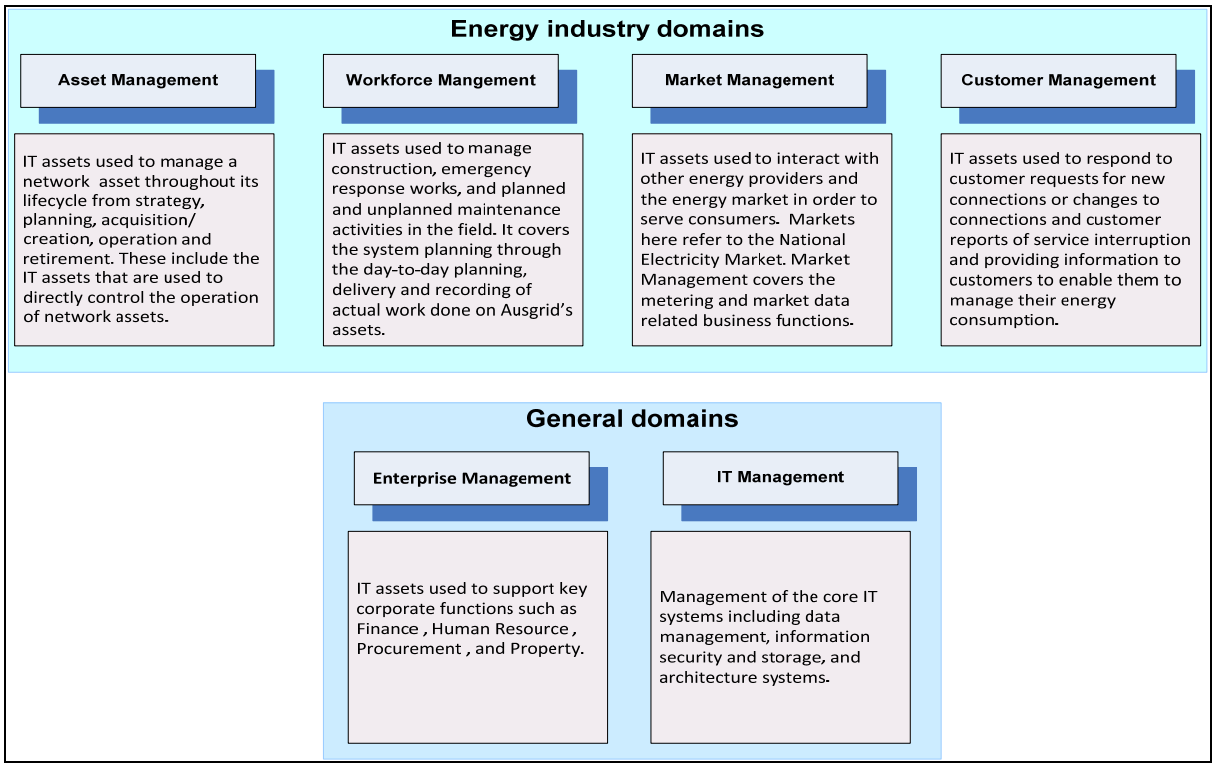

Figure 2: AEMO's Energy Industry Model (eIM) domains for technology

Using AEMO's eIM framework, we considered Ausgrid's customer expected outcomes and satisfaction against six factors when confirming the Technology Capital Plan:

1. Power quality and reliability
2. Price
3. Billing and payment
4. Corporate citizenship
5. Communications
6. Customer service

The detailed assessment of Ausgrid's Technology Capex Plan by domain is included within Appendix A.

Driver of business efficiency

The majority of Ausgrid's Technology Capex Plan is focussed on maintaining the business critical technology assets in an efficient and prudent manner to continue to meet our obligations as a DNSP. A limited number of projects has been selected for the implementation of technological change to drive productive and dynamic efficiencies. These projects were estimated to achieve a $45 million ($ real 13/14) business benefit over the 2014-19 period. In turn, this benefits customers in the long run by helping us lower prices and improved service quality. Key examples include:

- Substituting labour intensive manual processes with lower cost automated solutions. For instance, we now have automated workflows to assist staff to respond to outages more quickly and efficiently.

- Integrating asset management and financial systems. This enables our system planners to make better capital investment decisions, which leads to lower Capex and Opex forecasts in future regulatory proposals.

What services do we provide?

We carefully consider how technology can most efficiently be utilised to provide support to our DNSP and corporate activities. Many of our assets are common to one or more business functions. The key types of assets used to run our technology service include:

- *Infrastructure* – provides the foundation for technology services including processing power, memory, storage and security. Key examples include servers, data networks, and data centres. As a DNSP we are also required to have telecommunications infrastructure to operate and manage the network. This includes switches, routers and connectivity.
- *Applications and platforms* – enable our staff to perform specific tasks related to our network and corporate obligations. For example, our SAP platform enables us to perform a range of activities from financial reporting to tracking maintenance of network assets. We also have a number of other specific applications related to our activities as a DNSP including Geographical Information System (GIS) for tracking our assets, outage management systems to detect faults, and metering systems to help us accurately bill our customers.
- *Workplace technology* – These generally help our staff perform their daily tasks. This includes devices such as computers, phones, intranet services, and email systems.
- *Operational technology* – These assets are used to directly operate or manage devices on the electricity network, including SCADA support system or telecommunications between substations. It also includes a range of technologies that are collectively known as Smart Grid initiatives.

Figure 3. shows how infrastructure, applications, workplace technology integrate and support the IT domains.

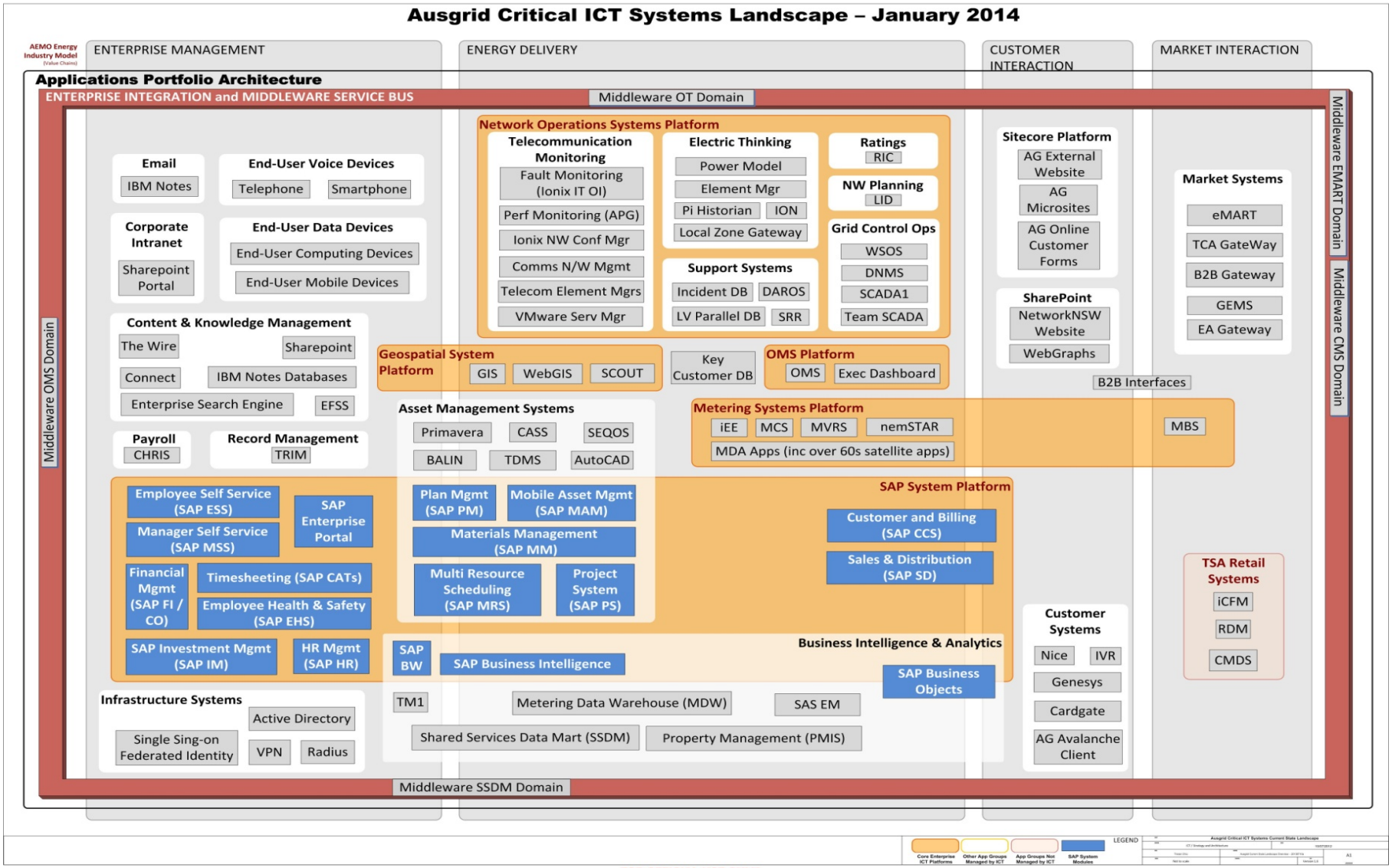

Figure 3: Ausgrid Critical Systems Landscape – January 2014

Why do we incur Capex and Opex on technology?

In the sections below we identify why Ausgrid incurs Capex and Opex to provide a technology service. We also describe how we address substitution possibilities between Opex and Capex.

Replacement, maintenance and enhancements

A significant proportion of Capex requested (91 per cent) is to maintain the currency of existing IT & communications and SCADA & network control systems. In a fast moving industry, technology assets generally have a short shelf life (compared to electricity network equipment), with limited or no vendor support at the end of an asset's life.

For this reason, Ausgrid constantly monitors the status of its technology assets to determine whether there is a likelihood that the asset will no longer be able to function adequately, be supportable, and to determine the consequence if no action is taken. In some cases, our options analysis will show that replacement or maintenance will be required to ensure that the asset remains in a functional condition.

We also undertake mandatory patch and release management of our assets in response to new or changed compliance obligations.

Investment in new systems

We invest in new assets when we consider there is a new compliance obligation, or the prospect of a cost efficiency in operations. Generally there are two reasons why we invest in a new asset:

- *New compliance requirements* – New compliance obligations arise from time to time, as a result of changes in the National Electricity Law or Rules and or broader corporate and financial obligations. In some cases, the most efficient solution to address the new obligation is to invest in a new technology asset. For example, Dial Before You Dig where locations of our network assets are provided to parties undertaking construction activities.
- *Identified efficiency opportunity* – Ausgrid is constantly assessing how technology can be used in the business to derive an efficiency saving. For example, we assess whether providing mobile technologies such as tablets would cost effectively reduce the labour costs of delivering our capital and maintenance programs.

Opex

The majority of our Opex is related to maintaining existing technology systems, licence fees to operate assets, and providing service and delivery support to the business.

We recognise that it is important to consider Capex-Opex substitution possibilities in providing technology support. For this reason or based on the Total Cost of Ownership (TCO) we may choose to outsource services or utilise Software as a Service (SaaS). As we note in Chapter 2 of this overview, the opportunities for cloud computing and virtualisation have been key considerations in deriving our Capex and Opex forecasts.

This overview is focused on our proposed capital program, but we note that the program will have an impact on the calculation of forecast Opex in the 2014-19 period.[3] For example, the replacement of an existing technology asset may reduce maintenance costs, which we have categorised as a 'consequential impact' on Opex. In other cases, a new efficiency initiative will lead to a productivity offset for Opex in a business area.

[3] This overview has therefore sought to explain how we have calculated the impact to opex in our forecast methodology. Our supporting business cases provide more detail on the impacts on opex from individual projects.

Our forecast Opex has taken the impact of consequential Opex and efficiency benefits into account as part of our forecasting process.

What objectives and principles underlie our expenditure decisions?

The key objective of our Technology service is to assist the business meet its required functions effectively at the least cost.

Our Technology strategy identifies key principles and broad strategies for meeting this objective. In particular, the underlying principles reflect how a prudent operator would seek to optimise our technology portfolio to meet the multiple needs of the business. This can be seen in Table 2. below

Principles	Description
Optimise the portfolio	Continue to standardise and simplify the application landscape to enable the adoption of common business processes across the enterprise and automate them using an enterprise-wide solution.
Leverage existing applications	For new business capabilities, ICT will leverage the complete application portfolio through a standardised solutioning process to ensure the optimal solution is identified. The least cost option is not necessarily selected where greater business benefits or strategic alignment exist with another option.
Increase utilisation of systems with spare capacity	Infrastructure will be shared across projects and business units. For example, the current technology allows physical servers to be configured as several virtual servers with proper segregation of access. This allows for greater utilisation of Ausgrid's ICT assets (typically increasing CPU utilisation from 20-30 per cent to 70-80 per cent), therefore enabling cost reduction.
Benefit quantification and benefit realisation	All project proposals need to demonstrate clearly how the business benefits will be achieved. Priority will be given to projects with a payback of less than four (4) years. A formal benefit realisation and benefit tracking process is in place.
Sustainability of the technology services	For core applications with unique Ausgrid functionalities and business rules (i.e. SAP, GIS, TIBCO, Metering), we will maintain an in-house pool of experts to ensure continuity of support and retention of knowledge.
Least cost solutions	New technologies and delivery models (e.g. cloud computing, in-memory processing) should be adopted only if the cost and risks are more favourable than alternative options.
Explore options other than replacement	Systems should be maintained or replaced only if the cost and risk of alternative support options exceed the maintenance or replacement cost.
Use commercially proven and standard packages	Bespoke and in-house development should be avoided in favour of proven commercial packages.

Table 2: ICT Investment Principles

Cloud computing in Ausgrid

Ausgrid is on the path to leveraging cloud services. Specifically:

- Ausgrid has a significant level of virtualisation[4] of servers and storage in its data centres which can enable a possible transition towards cloud services using Ausgrid-owned infrastructure assets (i.e. "Private Cloud");

[4] Virtualisation allows for the pooling or sharing of physical hardware across multiple applications. It allows Ausgrid to utilise otherwise idle hardware capacity more efficiently to reduce costs.

- Ausgrid already leverages Software-as-a-Service (SaaS) offerings such as TSO online timesheet entry, InfoHRM and Accelero using infrastructure owned by the service provider but dedicated to Ausgrid (i.e. "Virtual Private Cloud"); and

- Ausgrid external website www.ausgrid.com.au is hosted by Safecom (also "Virtual Private Cloud").

A number of strategic principles and guidelines have been defined in relation to the adoption of cloud computing, based on the cloud assessment mentioned above, as follows:

1. Be a follower, not a leader, in the adoption of cloud services (i.e. second wave or later) given the current fragmented market landscape;
2. Extend Ausgrid's virtualized infrastructure to enable moving towards a "Private Cloud" infrastructure-as-a-service capability;
3. Amend policies, procedures and frameworks (e.g. investment business cases, procurement, standard terms and conditions) to include cloud services as an option requiring prudent evaluation of costs[5] and risks[6]; and
4. Assess cloud services as a sourcing option at technology lifecycle re-investment points such as refreshes or migrations in the AER 1419 Reset.

The proposed high level cloud computing roadmap for the next 5-10 years at Ausgrid is depicted in the following diagram.

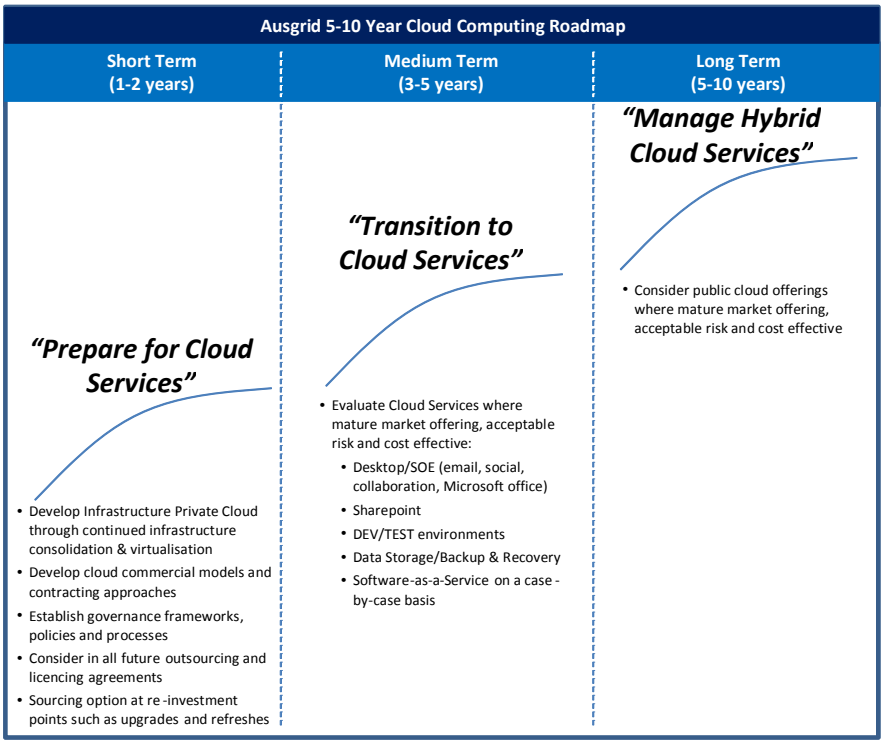

Figure 1 – High Level Ausgrid 5-10 Year Cloud Computing Roadmap

Based on the principles highlighted above and the analysis conducted during the AER1419 planning, Ausgrid's cloud computing strategy for the short to medium term (AER1419 Reset) can be summarised as follows:

[5] Costs include one-off migration costs, application changes, integration, security, communication and service payments
[6] Risks include vendor maturity, data sovereignty, security and privacy concerns and organizational readiness

- Mission critical core systems and capabilities will continue to be hosted at the existing data centres, under the existing service model. Risk levels, cost and effort to migrate excludes the core systems from being considered for cloud-based solutions;
- All major Development environments that support the core systems are also excluded, as they are hosted on dual-purpose DR/DEV infrastructure, hence there would be no benefit in moving them to cloud-based environments;
- Infrastructure – adoption of cloud-based compute and storage services will be limited to a number of non-critical non-production environments. Approximately 15% of the storage capacity required is planned to be provisioned under a private Infrastructure as a Service (IaaS) model starting from FY15/16. A proportion of the compute capacity required by development environments for new projects may also be cloud-based; and
- Workplace Technologies – cloud-based alternatives for email, collaboration and office productivity can not be justified as significant migration costs negate any possible cost savings. It is recommended however to re-assess these options during the initiation phase of the AER projects refreshing those platforms, against the offerings of the day.

Cloud-based alternatives will be considered and re-assessed for projects once the AER program is underway, even if their current evaluation does not make them the recommend option.

What are our governance arrangements?

As a prudent operator, Ausgrid has strong internal controls for ensuring efficient investment.

Controls exist at many layers within the organisation these range from those that are project specific through to setting the strategic direction.

Projects

At a project level the primary controls have been specified by the Project Management Framework (PMF). The PMF assists project sponsors, project managers, project teams and members of project committees in fulfilling their key responsibilities during each phase of a project. This has been achieved through the development of a common stage gated process that identifies and prescribes the project related deliverables and approvals that need to be achieved.

Governance

Various forums exist to ensure that the requested investments are delivered in the most cost effective manner, these include the:

- ICT Steering Committee (project and strategy approvals, Program of Works, etc);
- Enterprise Architecture review Board (solution fit for purpose, re-use of common platforms and technologies, Technology strategy and roadmaps);
- Information Security Governance Forum (risk management); and
- Project Management Steering Committee (project status).

Strategic Planning and Budgeting

In addition to the strategic planning that occurs as a part of the AER submission Ausgrid also conducts an annual budgeting process. From a Technology Plan perspective, the annual budgeting process is based on the program of work identified within the AER submission. This view is further refined taking into consideration:

- Known or pending changes to legislation;
- Business strategies; and
- Changes to market conditions.

Portfolio Prioritisation

In conjunction with the processes and forums noted above Ausgrid also maintains a defined Program of Work (PoW) and conducts regular review to ensure the validity of this. Priority of funding is allocated based on the following classifications:

- Compliance;
- Maintaining Core Systems; and
- Efficiency / strategic initiatives.

As part of the establishment of NNSW, an investment sub-committee performs a top-down review of the Technology Capex Plan in line with the objective to keep customer prices within CPI.

The process for developing the 2014-19 Forecasts is summarised in Chapter 3 - Our forecast process. Refer to the "*AER 1419 Technology Plan Costing Methodology and Estimates document*" for the detailed costing methodology.

Exclusions

The Technology Capex Plan excludes all expenditure related to the servicing of the Transitional Service Arrangement (TSA) with TruEnergy (now EnergyAustralia) as a result of the sale of the Retail customers and trade books.

1. Benefits from previous investment

Over the 2009-14 period, Ausgrid made significant inroads into consolidating our legacy IT & Communications and SCADA & network control systems assets after a period of significant under-investment. We also invested in new systems and applications to help us to efficiently and effectively deliver the step change in system Capex requirements.

The purpose of this section is to identify outcomes of investment in the 2009-14 period and the reasons for variation to forecasts. Examination of previous Capex can provide insights into the proposed Capex for the 2014-19 period, and the veracity of previous forecasting approaches.

Ausgrid made significant investments in IT & communications and SCADA & network control systems in the 2009-14 period to correct for previous under-investment and to support the increased capital program over the period. In the sections below, we provide more detail on the investment program, and the reasons for variation from the forecast Capex.

1.1 Consolidating legacy systems

The 2009-14 period marked a significant renewal of our technology facilities after a period of under-investment. This was acknowledged by the AER's consultant Wilson Cook at the time of the last determination when it stated:

"Overall, the proposed investment is in IT systems that are typical of those in other network businesses and a business the size of EnergyAustralia does require integrated systems to operate efficiently. The number of major projects over the period is high but this appears to reflect some previous under-investment."[7]

Our program of works were underscored by a clear strategy to consolidate legacy Finance, Logistics, Customer Management and Business Intelligence applications with equivalent functionality on the SAP platform.

This strategy was later extended to Asset Lifecycle, Works Management and the implementation of the integrated Asset Management system in SAP completed in 2009. The SAP strategy was extended to HR applications in the 2009-14 determination period.

1.2 New technology systems to drive efficiency

Ausgrid invested significantly in new technology systems within the 2009-14 period, key achievements include:

- The Data Centre Consolidation Program delivered significant risk mitigation in relation to data centre environments whilst also establishing a strategic platform for the future;
- Risk mitigation in end of life application maintenance includes the Geographic Information System (GIS), Outage Management Systems (OMS), TIBCO Middleware, Market Gateways and Metering Systems;

[7] Wilson Cook, ACT & NSW DNSP Expenditure Review – EnergyAustralia FINAL, p44 2008

- Improving customer service through the implementation of the Mass Call Platform (termed Avalanche) providing customers with a granular level of outage and restoration information;
- Migration of the Metering Business System from the Mainframe environment, Replacing the legacy MV90 metering system and consolidating end user developed metering systems into core enterprise systems;
- Implementation of the Meter Data Warehouse for Complex analytics and network pricing;
- Rolling out mobile computing to DOPS (District Operators), EMSOs (Emergency Service Operators), metering and field services;
- Commencement of the Field Force Automation Program for maintenance work with the project and broader program continuing well on into the AER1419 period;
- Implementing business planning, modelling and analysis tools to support AER planning and reporting;
- Implementation of The Wire (internal website) and replacement of the external website in order to comply with National Energy Customer Framework (NECF); and
- Improving regulatory and statutory compliance through the rollout of programs such as records compliance (REX).

1.3 Investments in operational technology

The focus of Ausgrid's operational technology strategy was to explore how innovative and emerging technologies could be used to deliver electricity services at a lower cost to customers in the long term. The key goals were to capture better data to improve business decision making, and to better automate the network to cost effectively provide electricity services.

Some of the benefits from investment include improved response times to reliability incidents. For example, deployment of new technology enabled the control room to more easily locate and rectify outages.

A key initiative brought forward and implemented in the 2009-14 period was the "Smart Grid, Smart City" project which was jointly funded by the Australian Commonwealth Government. The project provided the opportunity to explore the cost effectiveness of smart technologies that could be used to provide customers with a lower cost and more reliable service in the long term. Outlined below are some of the key activities we undertook as part of this trial:

- Electrical vehicles – Investigating the impacts of electric vehicles and the emerging business models for their deployment;
- Innovative generation solutions – Evaluating the addition of battery storage, renewable generation and solar photovoltaic (PV) and solutions to optimise their connection to the network;
- Assisting customers manage demand – The testing of innovative technologies that give customers information to more successfully manage power electricity bills and shift demand to non-peak times; and
- Synergies with NBN – Investigating the synergies between Smart Grids and the rollout of the National Broadband Network.

At the completion of the Smart Grid, Smart City program a Final Report, along with suite of separate monitoring and measurement reports will be delivered to the Australian Government and industry. These post implementation studies will include a detailed review of the project delivery, cost benefits for future adoption of smart grids.

1.4 Reasons for variation from forecast

The table below shows that Ausgrid exceeded the capital forecast allowance by $73 million (nominal) in the 2009-14 regulatory control period. This is shown in Table 3.

	2014/15	2015/16	2016/17	2017/18	2018/19	Total
AER determination						
- Non-network IT & Com	79.4	48.1	37.3	39.2	32.9	**236.9**
- Non-network SCADA & Network Control	26.5	27.5	51.2	25.7	10.3	**141.1**
TOTAL AER determination	**105.9**	**75.6**	**88.5**	**64.9**	**43.2**	**378.0**
Actual						
- Non-network IT & Com	50.6	57.0	36.8	28.4	27.9	**200.7**
- Non-network SCADA & Network Control	54.4	86.5	78.5	28.2	2.5	**250.1**
Total Actual	**105.0**	**143.5**	**115.3**	**56.6**	**30.4**	**450.8**
Variance						
- Non-network IT & Com	28.8	-9.0	0.5	10.8	5.1	**36.2**
- Non-network SCADA & Network Control	-27.9	-58.9	-27.3	-2.5	7.8	**-109.0**
Total Variance	**0.9**	**-67.9**	**-26.8**	**8.3**	**12.8**	**-72.8**

Table 3: Comparison of Ausgrid's forecast and actual Capex in 2009-14 ($ million, nominal)

Variations from forecast for IT & Communications

In terms of IT & Communications, Ausgrid prioritised its program of works over the period in response to changes in our business circumstance. The main variations to the program include;

- *SAP maintenance:* The project was initially scheduled to go live in FY09/10. However, in order to meet the IT & Communications obligations for the retail sale and the bedding in of iAMS, the schedule was revised. An increase in costs was experienced due to higher integrator costs to reflect market rates and extended delivery time as a result of the significant Retail IT separation transition program requirements impacting SAP.
- *Metering program:* The replacement and decommissioning of Metering Business System (MBS) through extending Ausgrid's core metering and asset management platforms (Itron IEE and SAP).
- *Network Billing program:* The timing of the Billing system and CIS (Customer Information System) was reviewed based on the length of the Retail TSA. Based on the review it has been deferred to the next period. Capital expenditure required for the projects has been reprioritised to emerging critical needs including, Avalanche and the Information Security project.
- *Outage Management System and Dispatch and Scheduling System projects:* The timing and / or need for the planned Outage Management System (OMS) and Computer Aided Service System (CASS)

maintenance projects were being reviewed based on the outcomes of the Distribution Network Management System (DMS) pilot and the subsequent roadmap for replacement.

Variations from forecast for operational technology

Variations to the forecast Capex for the operational technology component arose from factors such as:

- Changes in strategic priorities to prepare for an intelligent electricity network through investment in key underpinning technology platforms;
- Preparation at the beginning of the period for the likely scenario that future investment in a mandated rollout of AMI would occur;
- A more detailed intelligent network plan and strategy that has led to new investments; and
- The acceleration of some intelligent network activities to align with the opportunity to deliver the Australian Government's Smart Grid, Smart City initiative.

A significant investment that was not included in the forecast Capex was the 4G telecommunications network. The wireless communications network was to extend historic use of fibre between zone substations to deliver last mile communications capabilities. The purpose of this wireless network was to be constructed for use to communicate to the distribution and Low Voltage (LV) network (i.e. the poles and wires infrastructure that directly connects to our customers).

This investment was not known at the time of the AER 2009-14 determination and therefore was a strategic decision based on analysis at the time to reduce future operational costs envisaged from investment in smart grid devices on the low voltage. The investment was also underpinned to prepare Ausgrid to deal with the widely expected requirements of a future Advanced Metering Infrastructure (AMI) deployment.

In the 2009-14 period we also brought forward a number of network related and customer application projects in its smart grid roadmap to support the testing program for Smart Grid, Smart City program, and to leverage on the opportunities provided by the project. These projects include ways to optimise capacity, control the network, and deliver real time monitoring of the network.

Ausgrid brought forward a number of network related and customer application projects in its smart grid roadmap to support the testing program for Smart Grid, Smart City and to leverage on the opportunities provided by the project. These projects include:

- *Active Volt Var Control* – this investigates new grid based technology that has the potential to optimise capacity on the network. This has the potential benefit of allowing better management of existing assets and lead to future efficient investment. This is a key area of interest for a range of other distribution businesses around Australia.
- *Fault Detection Isolation and Restoration* – investing in these technologies is targeted at providing new ways to control the network. This will enable significant improvements to network reliability. These types of schemes are seen in many areas as the optimal way to invest in achieving short term improvements in reliability.
- Other Grid related trials – these trials include join investigations with transmission network service provider Transgrid and have sort to quantify the benefits in the stability of the electricity network, along with a range of new monitoring techniques across the electricity network. The two main trial areas are:
    - *Substation & Feeder Monitoring* – this trial is using historical asset performance data to help predict (in real time) current asset performance events and issues. This will enable faster operating decisions to prevent outages and a better understanding of asset

performance to improve maintenance plans. The monitoring utilises smart meters and electronic sensors of supply assets.

- *Wide Area Measurement* - is providing a pilot of real time monitoring of high voltage transmission and distribution lines using technologies such as phase measurement units. Ausgrid is collaborating with NSW transmission business Transgrid to install phasor measurement units at multiple sites around NSW to monitor conditions on the network. By leveraging the technology being used on overseas networks, Ausgrid is able to compare the results for Australian conditions.

The Smart Grid, Smart City project builds and leveraged from Ausgrid's Smart Grid Program. The Australian Government provided $93m for the demonstration of a range of new Smart Grid solutions and has been directed at activities that are either enhancements to the trials mentioned above or were requested as future opportunities for the industry. These demonstrations include:

- Investigating the impacts of electric vehicles and the emerging business models for their deployment.
- Evaluating the addition of battery storage, renewable generation and solar PV and solutions to optimise their connection to the network.
- The testing of innovative customer solutions that will provide insight into the benefits of these Smart Grid technologies. In particular the ability to manage electricity bills and the shift in network peak demand; and
- Investigating the synergies between Smart Grids and the rollout of the National Broadband Network.

We also investigated a number of customer applications as part of the Smart Grid, Smart City trials, which included deployment of two way communicating meters and home displays. This provided near real time information about electricity, gas and water usage and enables display onsite or through a web portal. A key purpose of these trials was to develop a robust business case prior to large scale rollout of such infrastructure to assess the savings that may be achieved for customers.

Alongside the technical evaluations outlined Ausgrid has a commitment to develop a range of community, industry and consumer engagement activities. This is designed to educate the community with regard to the benefits of Smart Grids as well as enrol participation in the trial. Ausgrid will use this trial to better understand the societal and consumer impacts of delivering Smart Grids and this will in turn build a blueprint to support future activities.

At the completion of the Smart Grid, Smart City program a Final Report, alongside a suite of monitoring and measurement reports will be delivered to the Australian Government and industry. These post implementation studies will include a detailed review of the project delivery, cost benefit and policy/standards recommendations for the future adoption of smart grids.

2. Circumstances in 2014-19

We have responded to underlying changes in our business environment as a result of industry reform. Our Capex program has been carefully prioritised. We have taken opportunities to defer maintenance where possible, incorporate efficiency projects with short pay backs, and leverage opportunities for cutting costs in providing our service.

The purpose of this section is to identify the key circumstances driving Ausgrid's Capex in the 2014-19 period. At a high level, it can be seen that Ausgrid's forecast Capex is significantly below actual expenditure in the 2009-14 regulatory. In total, proposed Capex will be 59 per cent lower than actual expenditure in the previous period (by $285 million).

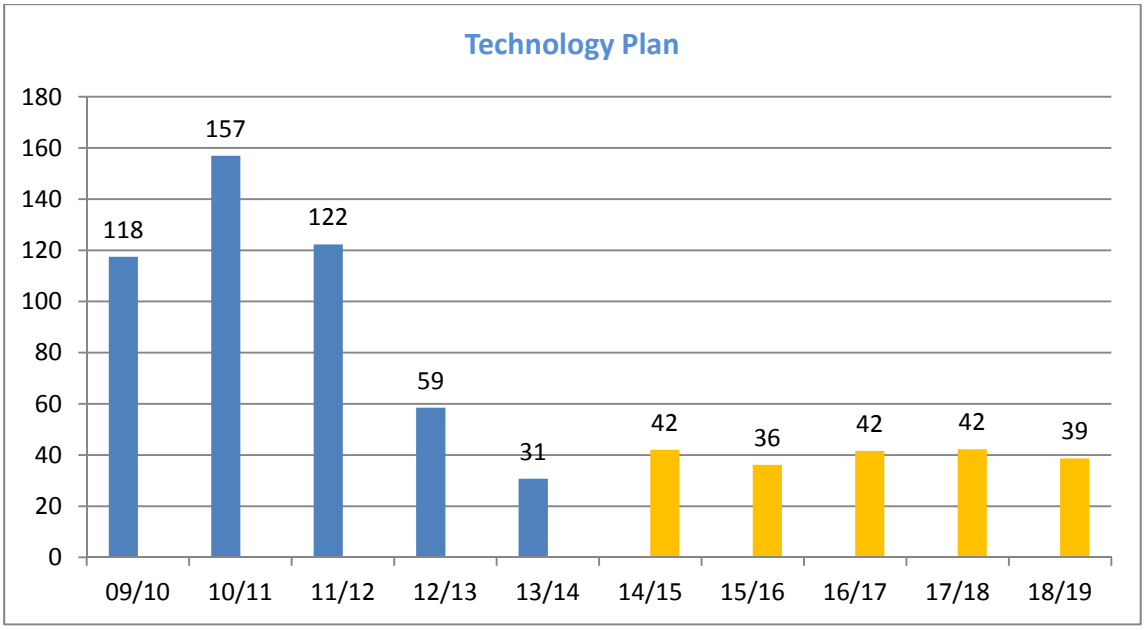

Figure 4: Technology Plan Capex – Actual expenditure ($ million, real)

Note: Unregulated service is excluded from 2014-19 to provide a like for like comparison

A key driver of lower cost requirements is a fundamental change in our operating environment. Recent reform of the NSW distributors has focused on capital and operating efficiencies to support our corporate goal of reducing price changes to below CPI.

Technology requirements have been impacted by the reform in two respects. Firstly, we have undertaken a comprehensive review of our IT & Communications requirements to reduce our capital and operating costs over the period. For instance we have:

- Sought to reduce our costs by identifying potential deferrals in the period where the risk can be tolerated. For example we have considered whether maintenance to existing systems could be delayed through increased support or accepting a higher level of risk. One example of this is where Ausgrid has delayed the maintenance of a number of Oracle databases and made use of extended support

arrangements. This approach has negated the need for Ausgrid to perform maintenance twice within the same AER period, resulting in a net cost saving;

- Limiting efficiency projects to those with short pay back periods. This will mean that the investments would deliver most of the benefits in the period, and would not result in increases in prices; and
- Leveraging efficiencies to drive down the costs of technology – This includes efficiencies that arise as a result of a common operating model across the 3 DNSPs, and new developments in the technology industry such as cloud computing which may enable us to provide technology services at lower costs.

2.1 Sweating our existing assets in 2014-19

In the FY14-19 period, the focus is on minimising the costs of providing technology services. Ausgrid has explored ways of mitigating the risks that arise from deferring maintenance and replacement.

Over the last decade, we have made significant investments in automating our core business processes. In the absence of this investment, our capital and operating costs would be far higher today. To preserve the efficiency gains and ensure the business can provide necessary functions, technology asset will be maintained and supported in a cost effective manner to extend their effective life.

Maintenance may be ineffective or too costly when a technology asset has reached the end of its life. Often, the vendor stops providing support at the end of the asset's life, which may expose the business process to significant risk. In cases like this, Ausgrid has examined several options to mitigate the risk including additional vendor support costs, in-house maintenance, replacement or capital upgrades.

2.2 Narrowing our efficiency projects

Our focus is on maintaining core functions, rather than investment in new assets. In the last period, our capital program was growing at a significant rate. Automation of our processes played a key role in ensuring that we were able to deliver the network system program, and that costs did not escalate in response to delivery issues.

The 2014-19 period marks a return to a more stable rate of network investment, and therefore the underlying need for new technology assets is not at the same level.

We have still identified a suite of potential new investments that could deliver efficiency gains to the business in the future. Our focus, however, was to identify which of these projects would provide benefits in the immediate to short term and not results in an increase in prices for the 2014-19 period.

The most notable examples of which include Field Force Automation (FFA) Program and DM&C Rollout.

2.3 Change in strategic direction for Operational Technology

On 1 July 2012, the Networks NSW (NNSW) operating model commenced with Endeavour Energy, Ausgrid and Essential Energy having a common Board of Directors, Chairman and Chief Executive Officer. A Group Management structure is being implemented to assist the Board and the Chief Executive Officer in undertaking reform of the industry consistent with the objectives of the NSW Government policy.

The Network Reform Project and establishment of NNSW has required all three network service providers, including Ausgrid to have a strong focus on minimising prices for our customers. This has led to a strategic re-evaluation of the adoption of smart technology on the network. While there are valuable long term opportunities from such investments, we have sought ways to better target these opportunities. The impact of this change on the Operational Technology strategy includes:

- Taking less risk with adopting new and innovative technology. Rather than being a pioneer of new technology, that there may be value in only adopting technologies that have been tried and tested;
- Identifying investments that have the greatest pay-back and which leverage previous investments at low incremental costs. In this respect the "Smart Grid, Smart City" project has been very valuable in identifying which technologies are likely to result in long term improvements to customer welfare;
- Introducing tighter controls on the approval of capital expenditure for SCADA and Network Control and Smart Grid technology. This also includes a strong focus on reducing the cost of delivery at the project design stage; and
- Wider analysis and risk prioritisation in parallel with the planning stage to investigate opportunities to defer the need for expenditure and develop more efficient investment options.

These initiatives demonstrate Ausgrid's ongoing focus and effort to be efficient in our operations. These significant savings are providing the foundation for Ausgrid to contain our share of customers' electricity bill increases to be at or below CPI for the next five year period. It will also provide for an even more efficient expenditure profile as we enter into the 2019- 24 period.

2.4 Leveraging opportunities to drive down costs of technology service

Our proposed program of work has been influenced by changes in our operating environment, and changes in the broader technology market.

Industry reform has been a key consideration in our Capex forecasts. We have looked for opportunities for synergies in providing a technology service across the 3 distributors. To a certain extent, this has been difficult given the disparate systems that each NSW DNSP has in place. In some cases, however, we have been able to identify opportunities to coordinate our Capex programs to deliver the same service at a lower average cost. Two examples include, managed print services and infrastructure contracts to reduce Facilities Management (FM).

We have also considered changes in the broader technology landscape. In recent years, there have been a number of changes in the paradigm for delivering technology services as a result of technology innovations.

Our portfolio has been responding to these developments in past years including concepts such as virtualisation which allows many “virtual servers” to run on a single set of physical infrastructure, to achieve greater CPU utilisation and a reduction in facilities management costs. Additionally we have been examining trends around cloud computing which enables outsourcing of the services we provide in-house and Software as a Service (SaaS).

3. Our forecast process

Ausgrid has thoroughly reviewed its BAU process for identifying investments in technology. The process is focused on identifying needs across the portfolio and selecting the most prudent and efficient option to address need.

The purpose of this section is to provide an overview of the process used to derive the proposed Capex for the 2014-19 period. Our process is focused on identifying needs, and selecting the most efficient option to address the need. The detailed approach is documented in the "*AER 1419 Technology Plan Costing Methodology and Estimates document*".

For the 2014-19 proposal we also undertook an additional review of the program to ensure that we had captured efficiencies from the network reform process, and considered opportunities to defer replacement expenditure. This was with the aim of minimising the price impact to customers in the 2014-19 period.

3.1 Identifying need and solution options

As a service provider to the business, our process to identify needs for the 2014-19 regulatory control period involved consultations with business units on requirements in the future. This review considers the current state of the technology portfolio, and how changes in the underlying business environment are likely to drive requirements on the portfolio.

The approach used to assess need and timing included:

1. Establishing the list of base systems required to deliver core business functions
2. Identifying the investment required based on the investment drivers
3. Identifying the most prudent and efficient option to meet the investment need
4. Prioritising the remaining options based on Ausgrid's strategic needs to bring the program value within the financial constraints agreed with Networks NSW

The forecasting method applied for the 1419 investment was based upon investment need. A need for investment ("investment driver") was identified through working with the business to:

1. *Meet new compliance obligations* – identification of new compliance obligations that we need to meet that requires enhancement to an existing system or a new investment;
2. *Maintain core platforms and capabilities* – maintaining the currency and capacity of existing systems to provide for standard control services in the most cost effective manner; and
3. *Improve efficiency:* identification of manual and labour intensive processes that could be made more efficient through technology enablers.

Each investment driver was linked to a technology roadmap to ascertain whether these requirements could be met with the existing technology architecture. Through a review of the current architecture, opportunities to optimize, augment or replace the current state architecture were identified. The alignment of the business

requirements and the technology architecture informed the AEMO derived functional area (known as the "Domain Roadmaps"). The efficiency projects were also reviewed for alignment to strategic initiatives.

Ausgrid identified potential options to meet that need, including Capex-Opex substitutions. Options were identified based on the technology strategy and target architecture, as well as, the following:

- Vendor and product roadmaps to determine potential maintenance of existing software and hardware;
- Emerging technology trends have provided an indication of strategies in potential technology capabilities and service delivery that could assist in maintaining core platforms and capabilities at a lower cost;
- External benchmark information has provided useful data on areas for improvement (refer to Appendix B); and
- Information on existing systems, for example, age, cost, and volume of transactions.

The most efficient and appropriate option to address the need was selected using the following method:

1. Application of an Efficiency Test (NPV);
2. Alignment to Technology principles, and
3. Option risk profile.

Figure 5. provides an overview of the process and approach taken:

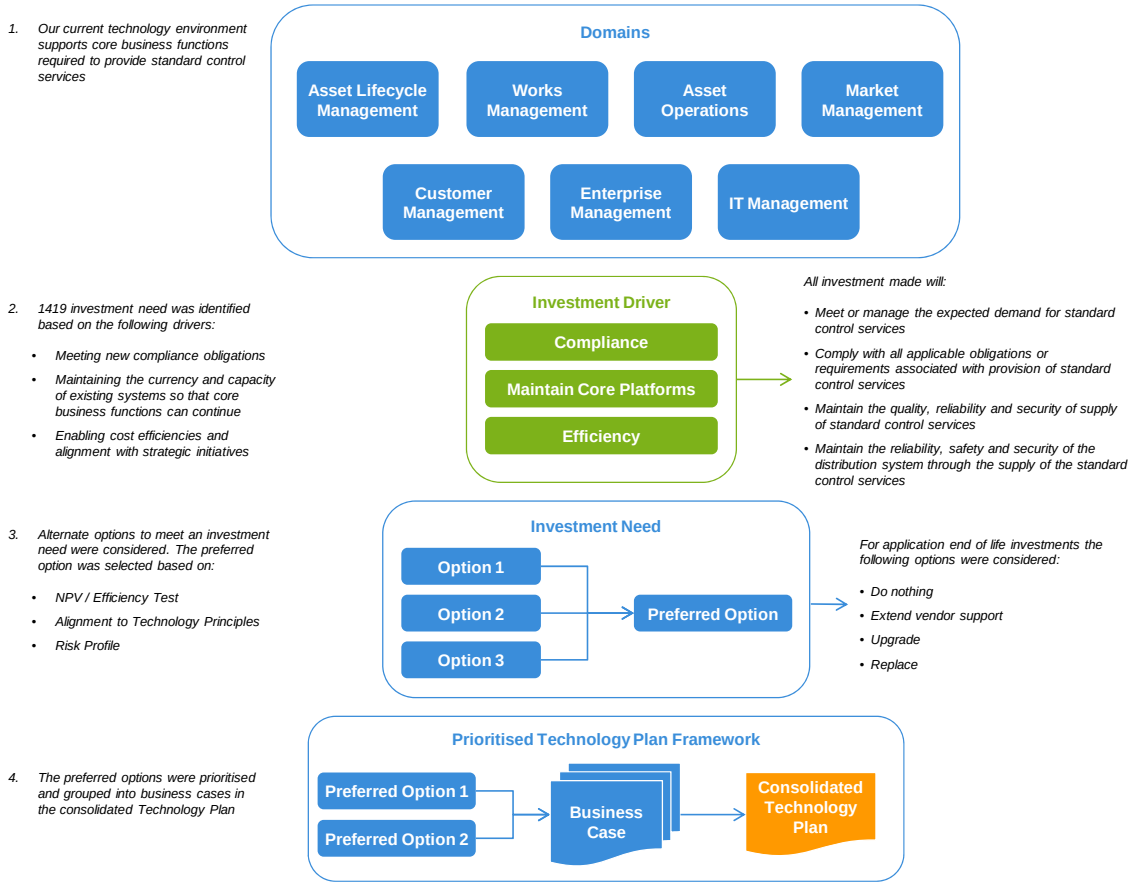

Figure 5: Technology Plan Forecasting Methodology

3.2 Unit Costs

In determining the costs of the various options considered, a standard set of unit costs were applied for Labour and Infrastructure Hardware.

Internal labour

Internal labour consists of employees (full and part time) under Enterprise Bargaining Agreements (EBA) and Senior Contract, as well as, labour hire. The internal labour unit cost is based on the FY12/13 actual blended rates. These are comparable to the available market information including an external Greythorn study. The Greythorn report surveyed over 2,500 technology professionals to adequately forecast market trends in FY12/13.

The divisional resource model includes a combination of employee and labour hire staff supporting technology operations, business initiatives and the Technology capital program. This model is considered efficient as it enables Ausgrid to increase and decrease its labour capacity in line with the business needs (and capital program).

We have split the labour unit cost by resource type as costs vary greatly between roles. Table 4 shows the labour unit costs used (per day).

Type	Description	Daily Rate
Internal Labour	Internal Labour – General	[redacted]
	Analyst Developer	[redacted]
	Business Analyst	[redacted]
	Business Resource	[redacted]
	Functional Analyst	[redacted]
	Infrastructure Analyst	[redacted]
	Program Manager	[redacted]
	Project Manager	[redacted]
	Senior Application Support Officer	[redacted]
	Solution Manager	[redacted]
	Systems Analyst	[redacted]
	Test Manager	[redacted]
Labour Hire	Internal Labour – General	[redacted]
	Analyst Developer	[redacted]
	Business Analyst	[redacted]
	Business Resource	[redacted]
	Functional Analyst	[redacted]
	Infrastructure Analyst	[redacted]
	Program Manager	[redacted]
	Project Manager	[redacted]
	Senior Application Support Officer	[redacted]
	Solution Manager	[redacted]
	Systems Analyst	[redacted]
	Test Manager	[redacted]

Table 4: Labour unit rates (Blended Rates, $ nominal)

Hardware

Hardware costs are made up of server, storage and network costs. Servers are physical computers dedicated to run one or more services. Based on the future state architecture proposed as part of the Technology 2014-19 plan, we assessed the future server requirements for each project and those required on an ongoing basis. This assessment was based on variables such as number of users, number of transactions, vendor recommendations and risk profile. Server unit costs were forecast based on reduced vendor contracts from FY12.

Storage volumes were forecast based an assumed storage growth of 15 per cent (10 per cent business as usual growth plus 5 per cent project driven growth). This is a conservative growth forecast given historical trends have shown an average annual growth of 25 per cent. Storage unit costs were forecast based on reduced vendor contracts from FY12.

We have also included the following strategies in the technology plan to further reduce hardware costs:

- Compression –compression strategies will be implemented and are estimated to reduce storage requirements by approximately 20 per cent.
- Software as a Service, platform as a service and infrastructure as a service– we will implement software and platforms as a service for non critical systems where the market offering is mature and it is cost effective for us to do so. This will mitigate the need to outlay expenditure for hardware

- Archiving – we will be employing archiving and de-duplication strategies to reduce storage requirements (3 per cent reduction has been incorporated).
- Program wide hardware forecast – whilst hardware needs were provided based on BAU and project requirements, opportunities for synergies were assessed at a program level. Hardware costs were able to be reduced through centralisation and sharing of environments in order to minimise the number of servers required.

We have split the hardware unit cost by Hardware type using a blended rate between our two outsourced vendors. Table 5 shows the hardware unit costs.

Type	Description	Capex	Opex p/a
Hardware	AIX Server (LPAR)	[redacted]	
	WIN Server (VM)		
	WIN Server (physical)		
	LNX Server (VM)		
	Onsite SAN / TB		
	Cloud Storage / TB		

Table 5: Hardware unit rates ($ nominal)

The unit costs for both labour and hardware have been benchmarked to available market rates and are considered reasonable.

The costs have then been escalated using real cost escalators.

4. Summary of program

The majority of our proposed Capex is to maintain our core systems and run the business

We are proposing total Capex of $140 million ($ real 13/14) for Non-network IT & Communications and $67 million ($ real 13/14) for SCADA and network and with the majority of expenditure in the early years of the regulatory control period. The majority or almost 91 per cent of technology expenditure relates to maintenance.

Technology Capex Program	14/15	15/16	16/17	17/18	18/19	Total	Total by Driver	% of Technology	% Maintain
1. Mandatory / Compliance									
01. Regulatory Changes to Market & Enterprise Systems	[redacted]						[redacted]	0	
1. Mandatory / Compliance Total									
2. Run the Business / Maintain the Core									
02. Technology Licensing Growth	[redacted]						[redacted]	87.50%	90.49%
03. ICT Security									
04. End of Life Application Upgrades									
05. Mandatory Patch & Release Management									
06. SAP Core Maintenance									
07. Infrastructure Capacity & Maintenance									
08. Workplace Technology									
09. Telecommunications Platform Maintenance									
12. DNMS and SCADA Program									
18. Network Secondary Systems Platform Maintenance									
2. Run the Business / Maintain the Core Total									
3. Efficiency / Improvement									
10. DM&C Rollout	[redacted]						[redacted]	9.51%	9.51%
11. Fieldforce Automation Program									
3. Efficiency / Improvement Total									
Grand Total	**43,434,745**	**37,240,613**	**42,943,803**	**43,843,623**	**39,901,104**	**207,363,888**	**207,363,888**	**100%**	**100%**

Table 6: Technology Plan Capex Program ($ real 13/14)

In the sections below we document the key highlights of our Capex. Further justification of our programs of works is set out in the supporting documents

4.1 New compliance obligations

Ausgrid utilises a number of bespoke (internally developed) and commercial off the shelf (COTS) systems to support mission and business critical Network and Customer Management business processes. These systems are required to operate and comply with the requirements of the following regulations and legislation:

- Australian Energy Market Operator (AEMO) and National Electricity Market (NEM) regulations;
- National Energy Customer Framework (NECF);
- Commonwealth Taxation Law; and
- The National Electricity Law and the National Electricity Rules (NER) legal framework

Based on this changes are expected in 4 main areas

- Market Systems Compliance with Regulatory Changes;
- NECF Reporting;
- Payroll System Maintenance; and
- Spatial Demand Forecasting Regulatory Recommendations Implementation.

4.2 Maintain existing systems

Over the last decade, Ausgrid has invested in the renewal and consolidation of core IT & Communications and SCADA & Network Control systems underpinning its key business processes which resulted in significant efficiency gains. These gains and core technology capabilities need to be sustained which means that Ausgrid needs to continue to invest in the maintenance of these systems. A significant portion (70 per cent) of our total CAPEX requirements are based on this need, it includes our;

- *Technology Licence Growth* – relates specifically to the purchase of additional licences for systems that is based on the number of connections (or associated meters) or measurements points on the Ausgrid network. This includes GIS, OMS, CCS and IEE.
- *ICT Security* – will implement Public Key Infrastructure (PKI and Security Information Event Monitoring (SIEM) solutions in a centralised manner. These are critical to maintaining and enhancing compliance with regulatory, legislative and industry requirements.
- *End of Life Application Maintenance* – covers a broad range of systems. For each domain recommendation have been made in terms of "Do Nothing, Maintain or Replace":
    - Asset Lifecycle Management - Maintain: Balin, SmallWorld GIS, CImage TDMS, CAD systems, PNI, Replace: Dial Before You Dig;
    - Works Management - Maintain: Primavera, Asset Operations, Maintain: OMS, ETP Platform component applications, Switching Request Register (SRR);
    - Market Management - Maintain: MBS, MVRS, and IEE, Replace: nemSTAR;
    - Customer Management - Maintain: Genesys, NICE and Meter Data Warehouse;
    - Enterprise Management - Maintain: SiteCore, TM1, TRIM and SharePoint; and

- IT Management - Maintain: SAS, ARIS, HP Quality Centre and TIBCO OT ESB and Oracle DBs.

- *Mandatory Patch & Release management* – Based on prior regulatory periods, Ausgrid has an obligation to implement mandatory patches and releases for the following systems (but not limited to):
  - Enterprise Information Applications (SAP, Chris21, other corporate wide applications) – Minor enhancements to cater for new regulatory requirements or statutory reporting changes, e.g. changes to payroll awards and superannuation; changes to workflow approvals and authority limits/levels in SAP as a result of organisational restructures; and changes to statutory and key financial reporting as a result of NSW Treasury and Networks NSW requirements;
  - Minor enhancements and Patch releases for customer facing systems (Website, Dial Before You Dig, Streetlight faults, Graffiti, Contact Centre & Avalanche systems);
  - Enterprise Information Applications (SAS/BI/BO/BPC/TM1) – Minor enhancements to cater for changes to statutory and key financial reporting driven by NSW Treasury and Networks NSW requirements;
  - Network Systems Services minor enhancements (GIS, OMS); and
  - Metering Applications minor enhancements (MBS, IEE, nemSTAR).

- *SAP Core Maintenance* – Ausgrid utilises a SAP Enterprise Resource Planning (ERP) system, to manage the organisations core business processes. SAP is Ausgrid's strategic enterprise platform and is classified "mission critical" due to the central role it performs in many of the organisation's core asset processes and functions. Ausgrid is required to perform regular technical maintenance on its core systems and solutions to ensure currency, compliance and reliability of the solution. By complying with the program, Ausgrid's core platform will remain supported by the product vendor without increased operational support costs.

- *Infrastructure Capacity & Maintenance* – Ausgrid's technology infrastructure is the hardware devices, software, networks and facilities that are required to develop, test, deliver, monitor, control or support the applications that underpin Ausgrid's critical business processes. This business case comprises projects to replace / maintain end-of-life physical and virtual servers, increases to CPU and storage capacity (including backups), and software updates and licence true-ups (based on BAU growth)

- *Workplace Technology* – Workplace Technology solutions are about ensuring that both individuals and Ausgrid as an organisation have the tools required to be productive in the workplace. At Ausgrid this means ensuring the existing workplace technology tools remain useful and current to allow staff access to the organisation's key business applications and corporate data repositories. The components included in this Workplace Technology Maintenance business case are:
  - Email System Maintenance
  - Desktop Standard Operating Environment (SOE) Maintenance
  - Mobile Computing Devices Maintenance

- *Telecommunications Platform Maintenance* – provides an extensive telecommunication network across our Corporate and Network environments. It facilitates reliable and cost effective information flow between field sensors/switches, technology systems and both premises based and mobile users. It is a key enabler for optimising the way in which the electrical grid is monitored and controlled

- *Distribution Network Monitoring System (DNMS) and Supervisory Control and Data Acquisition (SCADA)* – The DNMS system is a mission critical system which provides SCADA master station functionality, along with basic DMS (Distribution Management System) functionality. The DNMS is Ausgrid's primary SCADA system and used by both Sydney and Wallsend Control rooms. This business case caters for the maintenance of DNMS, mandatory parch and release management and infrastructure maintenance.

- *Network Secondary Systems Platform Maintenance* – Increasingly, measured data is available or inexpensive to add and data analysis is less expensive than the cost of approximations. As part of the ongoing focus of controlling business risk and reducing costs, it is necessary to drive greater usage of measured data in order to safely optimise the usage of network assets. The following three capital initiatives offer stand alone benefits and will also act to catalyse similar efforts.
    - Distributed temperature sensing – Utilises existing or new fibre-optic infrastructure in order to determine cable temperature and enable maximum safe utilisation of underground assets.
    - Measurement based modelling and decision making – Systematic update of business processes to utilise measured data where available rather than assumptions and to install measurement devices where it is less expensive to do so compared to current assumptions or asset replacement.

4.3 Efficiency initiatives

In addition Ausgrid is also planned to undertake a limited number of efficiency and strategic programs where a payback of less than four years can be achieved, or a strategic alignment utilising an existing technology set. Two programs have been identified that fit this criteria these being;

- *Distribution Monitoring & Control (DM&C) Rollout* – Ausgrid has historically relied on manual processes (which involve site visits) to perform such tasks as checking DC utilisation, checking voltage, checking fault indications etc. To address these issues, the DM&C Project was initiated in the AER 09/14 period. Since 2008/2009 DM&C devices have been deployed in the field as a kiosk retrofit solution, and, more recently a modified version of the DM&C device has been introduced as standard in new kiosk substations.
- *Field Force Automation* – focuses on improving the efficiency of field work execution and obtaining updates from the field without the need to issue paperwork and re-entry of data back in the office. The funding requested builds upon investments made in the 2009-14 AER determination to support a greater portion of the field force work types.

A conceptual view of the Technology Capex Plan by business case and customer domains is presented in Figure 6 overleaf.

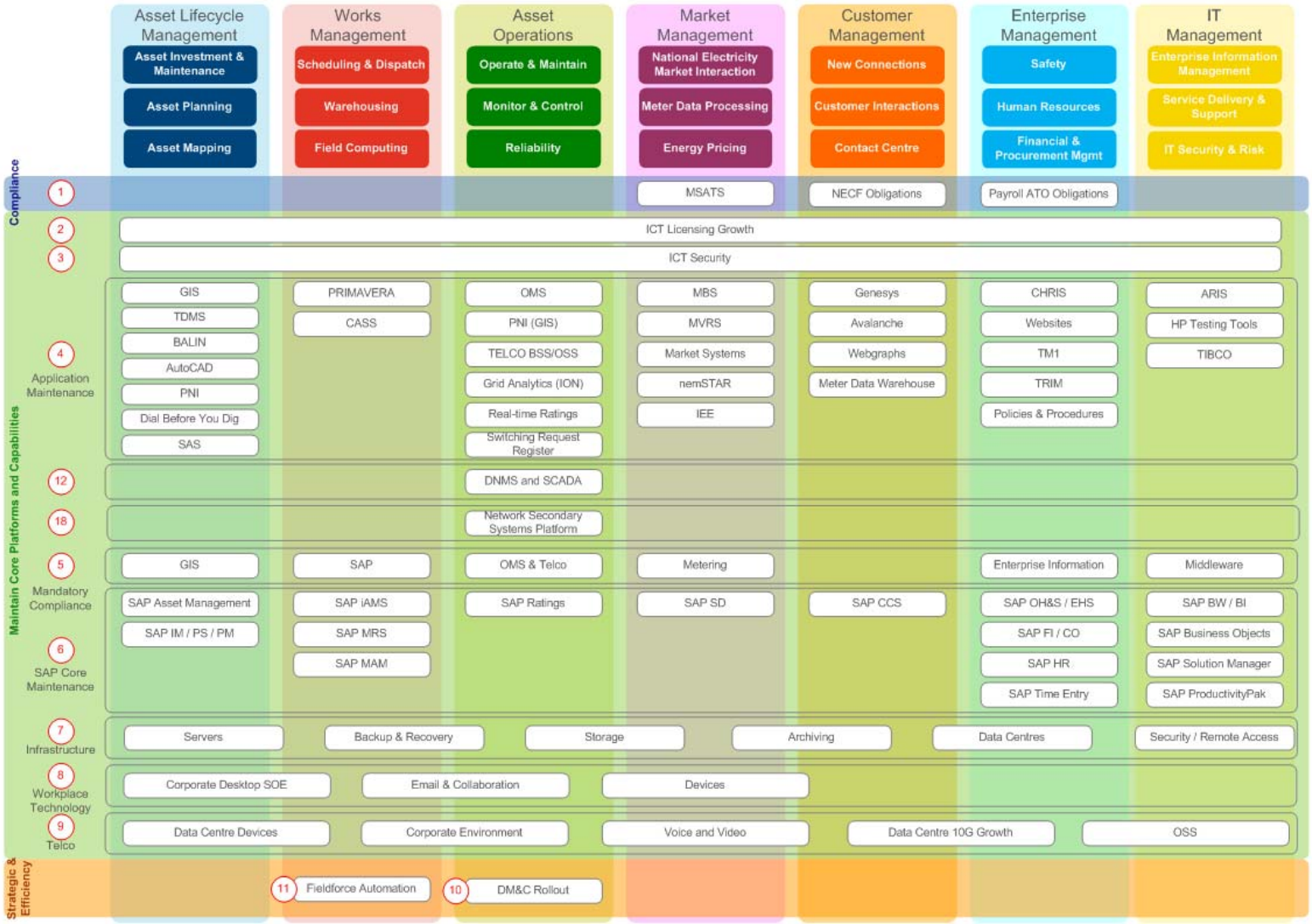

Figure 6: Conceptual representation of the Technology Capex Plan

4.4 Non-network IT & Communications expenditure categorisation

As required by the Regulatory Information Notice Under Division 4 of Part 3 of the National Electricity (New South Wales) Law (RIN), Table 1b. provides a breakdown of Capex between Client device, Recurrent and Non-recurrent expenditure (as defined in the RIN) by financial year for Non-Network IT & Communications Capex only.

Non-network IT & Communications Capex ($ 13/14)	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**Total**
Client device expenditure	1,044,576	301,067	303,502	1,877,810	1,707,009	5,233,964
Non-recurrent expenditure	3,969,689	1,308,527	2,181,638	6,917,926	-	14,377,780
Recurrent expenditure	17,392,911	19,616,889	24,818,560	20,935,953	22,223,044	104,987,356
Total Technology Capex	22,407,176	21,226,483	27,303,700	29,731,689	23,930,053	124,599,100

Table 7: Proposed technology Capex ($ 13/14)

The Non-network IT & Communications expenditure categories are based on the following:

- Client device expenditure relates to the end user hardware costs within the Workplace Technology business case;
- Non-recurrent expenditure relates to the Field Force Automation business case;
- Recurrent expenditure is the remaining Non-network expenditure;
- A portion relates to Alternate Control Services.

Appendix A - Customer focus

A summary of what the Technology capital program will deliver to our customers in each Business Function ("Domain") under the proposed 2014-19 Technology Plan is outlined below.

Asset Lifecycle Management

Asset Lifecycle Management	
Domain scope	**Key business / customer outcomes**
Asset lifecycle management is a business capability required to manage a network asset throughout its lifecycle from strategy, planning, acquisition / creation, operation and retirement. These include the technology assets that are used to directly control and manage the operation of network assets.	• Maintenance of existing applications to enable Ausgrid to continue to meets its legislative obligations such as Dial Before You Dig will be maintained; and • SAP EAM, GIS GE SmallWorld, and the network drawing tools are core systems required to support asset management, outage management and network design functions. Upgrades to these core systems are required within 1419 so that critical vendor support and interoperability is maintained.
	Business benefits and efficiency opportunities
	• Ausgrid will continue to review business process and operational efficiency leveraging the integrated SAP EAM, as part of its continuous improvement program.

Works Management

Works Management	
Domain scope	**Key business / customer outcomes**
Works Management is a business capability to manage construction, emergency response works, and planned and unplanned maintenance activities. It covers the system planning through the day-to-day planning, delivery and recording of actual labour and materials within Ausgrid's assets.	• New National Energy Customer Framework (NECF) obligations will require investment in notification systems to ensure we meet new customer response times. • The works program in the 1419 period will focus on maintaining the existing standards and reliability of the network more efficiently. We will maintain the core works functions through replacing current scheduling and dispatch, warehouse and vehicle management systems with more cost effective solutions.
	Business benefits and efficiency opportunities
	• The mobility strategy has identified efficiencies in core business processes including, real time prioritisation, scheduling, dispatch of all work and materials management. The technology investment required to deliver these improvements will result in cost reduction in the labour workforce and cost reduction in our stock levels.

Asset Operations

Asset Operations	
Domain scope	**Key business / customer outcomes**
The Asset Operations domain supports critical infrastructure for the monitoring and control of the electrical distribution network. The core high level business processes covered by domain include: • Asset Operation Strategy and Planning; • System and Plant Operation; and • Asset Operation Performance Management.	• Maintenance of existing applications that allow Ausgrid to meeting its legislative obligations will be maintained; and • For telecommunications systems, we will maintain existing capabilities, grow in line with increased data volumes and usage and adopt proactive information security monitoring capabilities aligned with other areas. *Network specific* • The current SCADA/DNMS systems will be maintained to a supported state and replaced in the back-half of the 1419. • For Network Control systems, such as DM&C, ETP and RIC, we will maintain existing capabilities, grow in line with increased data volumes and usage, and, for specifically for RIC enable further functionality to achieve a baseline Business As Usual (BAU) capability.
	Business benefits and efficiency opportunities
	• No new efficiency related investments have been identified for 1419 but with the continued adoption of standardised information technology capabilities in use through-out Ausgrid, operational efficiencies will be achieved.

Market Management

Market Management	
Domain scope	**Key business / customer outcomes**
Metering & Market management is a business capability required by Ausgrid in order to interact with other energy providers and the National Electricity Market in order to serve consumers. The core high level business processes covered by domain include meter data processing and energy pricing.	• Continue to invest in our existing metering systems to ensure compliance with new AEMO MSATS requirements; • Ausgrid is in the process of replacing its end of life nemSTAR application with investments continuing into the 1419 period. 1419 also includes the continued mandate for interval type 5 meters for all new and updated sites. Ausgrid's current type 5 metering system will require an increase in capacity and currency in order to ensure these functions are delivered in a cost efficient manner. • The network will still include type 6 and manual meters in the next period which will require continued support in order to provide meter data processing and network pricing functions. • The volume of meter data is forecast to increase significantly in the 1419 period as are the requirements of Retailers and Consumers. In order to continue to provide network pricing functions, we will need to invest in improving our data storage.
	Business benefits and efficiency opportunities
	• No new efficiency related investments have been identified for 1419.

Customer Management

Customer Management	
Domain scope	**Key business / customer outcomes**
Customer Management as a business function consists of: • Responding to customer requests for new connections or • Changes to connections and • Customer reports of service interruption and • Providing information to customers to enable them to manage their energy consumption.	• Ausgrid will maintain existing meter services billing functions by replacing the existing system with a more secure and integrated solution. Additionally an upgrade to the network pricing tool will be undertaken so as to ensure core network pricing functions are not impacted by lack of vendor support. • New compliance obligations are expected in 1419 with the introduction of NECF (National Energy Customer Framework). To ensure compliance, we will make enhancements to our existing call management system and utilise available technology to provide usage information directly to the consumer. • The AEMC has also indicated a likely rule change to the NEM scheduled for late 2013 which is aimed at improving consumer participation in the market and further reducing network investment through improved capability to manage peak demand. If the rule change is implemented, Ausgrid needs to develop systems to allow customers to access their energy usage and industry tariff information.
	Business benefits and efficiency opportunities
	• At the completion of the TSA, significant savings through efficiency gains along with risk mitigations (to support audit and regulatory requirements) will be gained by replacing legacy applications / process with a new more efficient system. • Until such time as this new Network Billing solution is built and enabled, existing TSA resources will be required to support the current solution.

Enterprise Management

Finance	
Sub-domain scope	**Key business / customer outcomes**
Finance is a business capability required to manage the: • Recording and reporting of financial information • To meet the internal control requirements, s • Statutory reporting and • External regulations.	• Maintain core Finance systems during 1419 to offset increases in operational expenditure by retaining standard critical vendor support; and • Implement enhancements to existing core financial systems to retain compliance with accounting, tax and legislative standards and to support new regulatory and compliance obligations.
	Business benefits and efficiency opportunities
	• Ausgrid is not proposing any new efficiency projects within the 1419 period given the recent investment in existing systems.

Human Resources and Environment Health and Safety	
Sub-domain scope	**Key business / customer outcomes**
HR and Employee Health & Safety is a business capability required to: • Manage employees which includes recruitment, learning and development, retention, utilisation, performance management and retirement. • Ensure that environment, health and safety capabilities are significant components in Ausgrid's business operations.	• The current payroll system is coming to end of life. An upgrade with a more cost effective and supported system in order to maintain core payroll functions for the organisation. • Enhancements will be made to existing core financial systems in order to be compliant with new HR and OH&S standards.
	Business benefits and efficiency opportunities
	• Ausgrid is not proposing any new efficiency projects within the 1419.

Enterprise Management (continued)

Procurement	
Sub-domain scope	**Key business / customer outcomes**
Procurement is a business capability required to: • Manage the compliance to procurement policy, • Contract management and • Manage supply chain risk and control expenditure.	• Maintain core contract management functionality by replacing the current contract management system with the most cost effective, secure and reliable solution. **Business benefits and efficiency opportunities** • Ausgrid has proposed investment in series of solutions such as Contract Lifecycle Management, new Spend Analytics capabilities, Supplier Relationship Management and eSourcing Software which will result in savings for the rest of the business. These cost efficiencies will be driven through reduction in support costs, increased focus on strategic planning of sourcing activities, optimisation of contracts and streamlining procurement processes.

IT Management

Business Resiliency and Risk Management	
Sub-domain scope	**Key business / customer outcomes**
This IT sub-domain covers the protection of the confidentiality, integrity and availability of information and information processing systems through the implementation of security controls and the application of risk management practices. It includes disaster recovery planning and business continuity management.	• Proactively manage threats and risks to its critical information assets by implementing an ISO 27001 compliant Information Security Management System (ISMS) across the organisation.\ • Achieve continued compliance with the NSW Government Directives: ISO 27001, "Information technology – Security techniques: Information security management systems". **Business benefits and efficiency opportunities** • No new efficiency related investments have been identified for 1419.

Enterprise Information Management	
Sub-domain scope	**Key business / customer outcomes**
Enterprise Information Management (EIM) refers to the recording, processing and presentation of data to support decision-making as well as the management of multi-media documents and records to facilitate workflow and collaboration.	• Ausgrid will maintain the core content management function by implementing minimal maintenance improvements in core EIM applications to offset increases in operational expenditure, rationalise the existing Lotus Notes policies and procedures databases and migrate to the enterprise collaboration tool; and • Improvements in line with various regulatory and compliance obligations will be implemented in key reporting and record keeping systems. **Business benefits and efficiency opportunities** • No new efficiency related investments have been identified for 1419.

IT Management (continued)

<table>
<tr><th colspan="2">IT Service Delivery and Support</th></tr>
<tr><th>Sub-domain scope</th><th>Key business / customer outcomes</th></tr>
<tr><td rowspan="2">Service delivery and support includes the processes and functions to ensure the IT infrastructure and capacity are maintained to support the organisation requirements. This area covers the maintenance of the hardware and basic software (eg operating system) required for running applications (servers) and the communications network (core transmission, data centre, last mile access, LAN and WLAN and Operational Support Systems) for connecting the machines internally and externally, as well as, end user access devices (eg PCs, mobile devices) for users to gain access to the applications.</td><td>• In 1419, we will maintain core service delivery and support through cost effective investments to ensure currency of hardware, operating systems and databases.
• Hardware refreshes (according to product roadmaps and risk) and capacity upgrades will be undertaken to support growth requirements for core business critical platforms.
• Maintain the end user computing function (for example, email) through the most cost effective and secure solution.
• Ensure that mobile devices remain current so as to comply with vendor support arrangements.
• Maintain the communications assets to deliver the current communications quality and grade of service in line with increased traffic demand.</td></tr>
<tr><td>Business benefits and efficiency opportunities
• Improve the efficiency of our infrastructure resource management and operations function through continued virtualisation and adoption of new technologies where cost effective.</td></tr>
</table>

Appendix B - Benchmarks

Ausgrid has been participating in a biennial KPMG benchmarking exercise which compares the performance of organisations in the utilities industry in Australia in a range of metrics, with the aim of helping organisation's identify where they are in relation to the overall trend of their peers so that their strengths and areas for improvement can be identified and turned into meaningful action. This exercise also considered the distribution network service provider (DNSP) metrics.

The key DNSP metrics are shown and discussed below:

DNSP ICT Metric	2012/13		2011/12		Comments
	Ausgrid	Industry Mean	Ausgrid	Industry Mean	
Operational Expenditure					
Non-network ICT operating expenditure as % of annual operating expenditure	11.88%	11.93%	10.76%	11.30%	Ausgrid DNSP ICT opex metrics are consistently below the industry mean. There has been a significant focus on cost reduction since NSW network energy reform.
Non-network ICT operating expenditure per DNSP customer	$38	$44	$41	$43	
Non-network ICT operating expenditure per DNSP employee	$11,086	$14,702	$11,678	$13,226	
Non-network ICT operating expenditure per DNSP end user	$9,648	$12,402	$8,564	$10,292	
Non-network ICT operating expenditure per DNSP device	$7,814	$9,959	$8,108	$9,381	
Capital Expenditure (Average)					
Average annual non-network ICT capital expenditure (recurrent & non-recurrent) as a % of RAB	0.39%	0.44%	N/A	N/A	Ausgrid ICT DNSP capex metrics were mixed. Ausgrid was below the industry mean for recurrent and total ICT capex per DNSP customer, as well as per DNSP device. This is a result of Ausgrid's investment in strategic platforms in the current regulatory period. Refer below for the total DNSP ICT expenditure metrics.
Average annual non-network ICT capital expenditure (recurrent) per DNSP customer	$21	$17	N/A	N/A	
Average annual non-network ICT capital expenditure (recurrent & non-recurrent) per DNSP customer	$33	$30	N/A	N/A	
Average annual non-network ICT capital expenditure (recurrent & non-recurrent) per DNSP end user	$8,427	$10,691	N/A	N/A	
Average annual non-network ICT capital expenditure (recurrent & non-recurrent) per DNSP employee	$9,683	$9,840	N/A	N/A	
Average annual non-network ICT capital expenditure (recurrent & non-recurrent) per DNSP device	$6,826	$6,665	N/A	N/A	
Total expenditure					
Non-network ICT operating & capital expenditure per DNSP customer	$55	$72	$64	$79	Ausgrid is below the ICT DNSP total expenditure metrics. This highlights Ausgrid has an efficient mix of opex and capex.
Non-network ICT operating & capital expenditure per DNSP employee	$16,192	$23,688	$18,120	$24,062	
Non-network ICT operating & capital expenditure per DNSP end user	$14,091	$21,914	$13,288	$21,669	