AusNet Electricity Services Pty Ltd

Electricity Distribution Price Review 2016–20

Appendix 7E: Information and Communication Technology Strategy CY2016 - CY2020
(Public Version)

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AusNet Electricity Services Pty Ltd

Electricity Distribution Network: Information and Communication Technology Strategy CY2016 - CY2020

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Documentation Distribution

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1. Executive Summary

This ICT Strategy outlines the strategic direction and forecast capital expenditure to deliver AusNet Services' information, communication and technology capabilities for the Electricity Distribution Network in the CY2016-CY2020 EDPR period.

ICT drivers and planned response

The key drivers of the ICT strategy in CY2016-CY2020 period are:

- Supporting the achievement of corporate, business, network and asset strategies;

- Maturing the capabilities of ICT to improve enablement of business valued outcomes;

- Reducing ICT Capex requirements while realising the full value of existing investments; and

- Controlling ICT Opex and delivering an efficient ICT operation.

ICT must also implement efficient and effective responses to:

- External Drivers including the ability to comply with industry regulations and requirements such as regulatory information requirements; meet community expectations for the management of safety and the environment; and adapt to changing customer needs and expectations.

- Technology Drivers such as opportunities presented by smart devices, big data and the convergence of information and operational technology; increased and evolving threats to data, systems and assets; and the availability of technologies such as cloud computing and server virtualisation.

In response to these drivers, the priorities for ICT in the CY2016-CY2020 period are:

- **Leverage Core** – simplify the ICT landscape and leverage efficiencies and costs across the distribution (electricity and gas) and transmission networks.

- **Information Enablement** – build data and analytics capabilities enabling improved business-led and contextual decisions.

- **Communications Enablement** – build communication capabilities that enable effective management of networks and assets.

- **Security Enablement** – protect our customer/business information, revenue and brand.

These are supported by improved capabilities in project and portfolio management and the implementation of an updated project delivery model which features a system integrator panel.

Current period performance

In this CY2011-CY2015 regulatory period, AusNet Services made a significant and successful step in delivering an enterprise-wide ICT approach that recognises the increasingly critical role of ICT, the potential to drive future productivity and customer service improvements, and the need to mitigate negative cost and business impacts associated with legacy systems.

The ICT capex investments made in the current period have delivered:

- Enterprise Asset Management / Enterprise Resource Planning (EAM/ERP) transformation;

- Replacement, consolidation and/or integration of systems;

- Remote, secure access to centralised documents and integrated data;

- Enhanced data warehouse capabilities and better data visualisation; and

- Replacement, rationalisation and/or extension of IT infrastructure assets.

Overall, actual spend (nominal, including overheads) was $[C-I-C] ([C-I-C]%) greater than regulatory allowance. The overspend was driven by two initiatives; Network Management Automation (NMA) and Advanced Metering Infrastructure (AMI). Within the period AusNet Services re-prioritised capital to support the transformational investments, deferred some projects and extended the life of some IT assets.

Figure 1 – AER Determination vs Actual/Estimate EDPR CY 2011 - CY 2015 ($, nominal)

	AER Determination	Actual/ Estimate	Variance
IT Capex	[C-I-C]	[C-I-C]	[C-I-C] ([C-I-C] %)

[C-I-C]

Note – These figures are total figures (include overheads) in nominal dollars and include the regulatory allowance and actual spend for SCADA IT.

Forecast period capex

The focus in the forecast period (CY2016-CY2020) will be on delivering the remaining core elements of the enterprise strategy to complete the modernisation of AusNet Services' ICT environment and realising the benefits of these investments. There are seven key programs of work to be undertaken:

- **Network Management** – aims to increase safety, network reliability and performance by automating network monitoring and responses; data consolidation and improved visualisation of network performance;

- **Information Management** – aims to improve the management of networks and assets through improved data and analytics capabilities;

- **Metering and Customer Services** – aims to meet customer demand for information and communication through a centralised customer relationship management solution and enhanced digital capabilities;

- **Works and Asset Management** – aims to improve network reliability and operational efficiency by leveraging the EAM/ERP investment to rationalise, consolidate and optimise business processes;

- **Information Security** – aims to protect distribution network, and customer and business information through enhanced 'protect and detect' capabilities;

- **Corporate** – aims to fully leverage EAM/ERP solution including providing a secure and consistent view of data throughout the organisation;

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- **Information Technology** – aims to control ICT opex in future periods by undertaking prudent lifecycle refreshes of storage, enterprise server, desktop and laptop fleet, corporate network and communications and investments in storage and visualisation enablement.

The forecast cost of the above CY2016-CY2020 capex is $[C-I-C] ($real, 2014 direct, excluding overheads). The annual forecast, by program, is shown in the figure below.

Figure 2 – Proposed Yearly CAPEX by Program of Work for EDPR CY2016-20

[C-I-C]
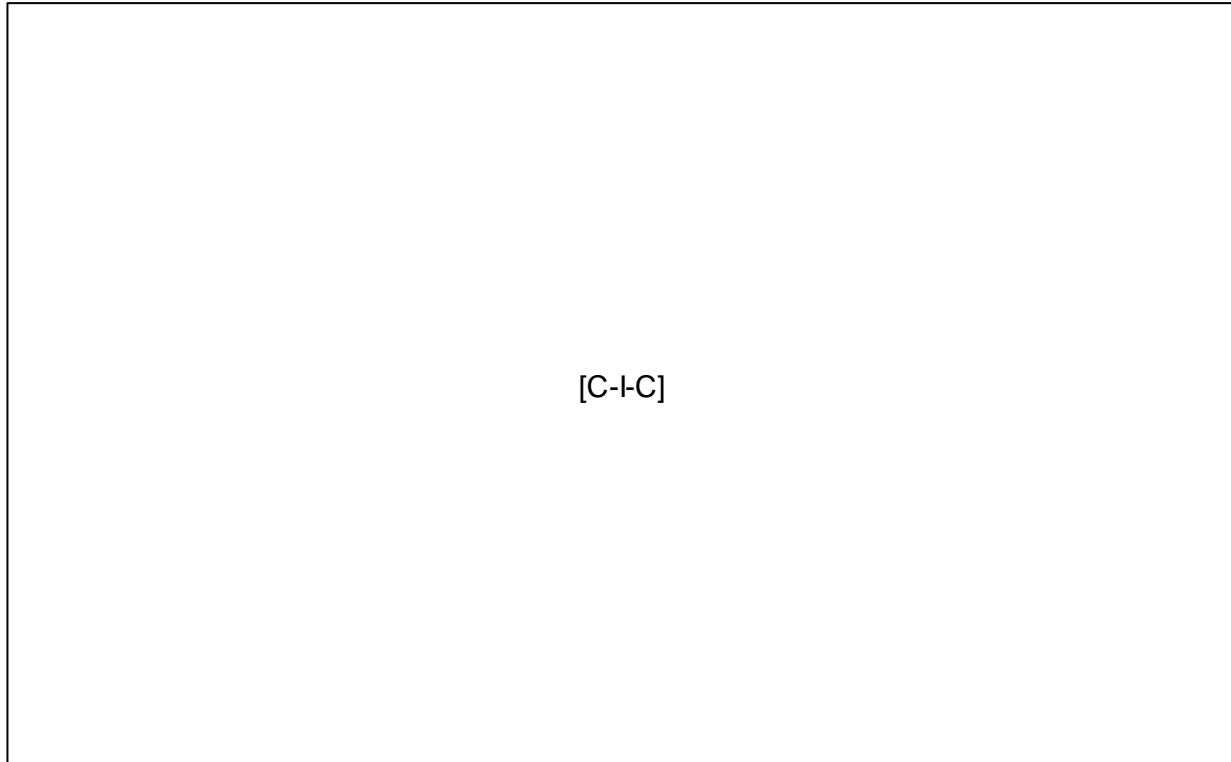
The benefits and outcomes expected from the program are:

- Improved customer satisfaction and brand recognition;
- Improved workforce and public safety;
- Improved operational efficiency;
- Reduced operational and regulatory risks;
- Improved regulatory compliance;
- Improved asset, network and service reliability;
- Controlled ICT capital expenditure; and
- Controlled ICT operational expenditure.

For the CY2016 - CY2020 regulatory period, AusNet Services is focused on modernising its applications: the tools that ICT provides to support electricity distribution business processes. Forecast investments are also aimed at readying AusNet Services to evolve in response to the expected business environment post CY2020.

2.   Overview

2.1.   Purpose

The Electricity Distribution Network Information and Communication Technology Strategy (ICT Strategy), sets the direction and defines an actionable ICT program of work to meet the business' requirements for CY2016 – CY2020.

The ICT strategy has been created to articulate and support the forecast ICT Capex required to manage the AusNet Services' Electricity Distribution Network.

This document:

- Articulates the key areas of focus for ICT investment, key risks, key programs, costs and service standard outcomes;

- Defines linkages of the ICT Strategy to the overarching Asset Management Strategy (AMS) and underpinning Asset Management Plan; and

- Consolidates existing strategy documentation that may predate this document.

2.2.   Scope

The ICT Strategy is aligned to the AusNet Services' AMS, Asset Management Strategy – AMS-01-1 Electricity Distribution – Asset Management System Overview and is supported by the ICT Technology Plan.

The scope of this document is limited to:

- ICT solutions required to support the AMS (including information management, IT applications, and communications technology);

- The Electricity Distribution Price Review (EDPR) period CY2016 – CY2020;

- AusNet Services' Regulated Electricity Distribution business; and

- AusNet Services' Alternative Control Services (ACS).

This document excludes:

- Metering costs associated with the implementation of the Advanced Metering Infrastructure Review (described in the document AMS Electricity Distribution – Metering Submission);

- In-field Network Operations infrastructure such as SCADA terminal units and dedicated SCADA serial network (described in the document AMS Electricity Distribution – Network Submission);

- Communications strategy (described in detail in the document AMS 10-81 Electricity Distribution - Communications Systems);

- ICT in support of AusNet Services' electricity transmission and gas distribution networks (described in documents: Information and Communication Technology Strategy CY2013 – CY2017 Gas Distribution Network and Information and Communication Technology Strategy FY2014/15 – FY2016/17 Electricity Transmission Network); and

- ICT in support of AusNet Services' unregulated business activities.

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All cost and benefit estimates provided in this document are, except where otherwise indicated, restricted to:

- All dollar values represent real 2014 Australian dollars;

- All dollar values refer to direct costs only (excludes overheads); and

- All forecasted values are based on current project priorities.

2.3.   Structure

This document is structured as follows:

- **ICT Capex in Context**: This section outlines the context for AusNet Services ICT in CY2015 at the start of the control period. **Appendix A – EDPR CY 2016 - CY 2020 – Methodologies and Processes** provides further support to this section defining the key processes and frameworks that underpin the development of the ICT Regulatory proposal.

- **2011-15 Historic Capex:** This section provides a high level overview of the projects completed during the current Electricity Distribution Price Review (EDPR) period (CY2011 - CY2015). **Appendix B – EDPR CY 2016 – CY 2020 – Detailed Historical Programs** describes in further detail the benefits realised and how they contribute to the strategic direction, as well as any variances in actual capex against regulatory allowance.

- **Benchmarking**: This section compares ICT Capex for AusNet Services with other DNSPs and provides commentary on the benchmarking results.

- **Forecasting Methodology:** This section identifies ICT guiding principles and key strategies based on those principles to direct AusNet Services' investment in technology solutions. This section is further supported by **Appendix C – EDPR CY2016-20 ICT Strategic Approach** that further outlines business and IT drivers, emerging trends and technologies that inform these ICT strategies and where synergies have been leveraged across the different energy networks and business divisions. It also provides an overview of the challenges and opportunities of AusNet Services' application and technology environments and the gap between current and target future capability.

- **Forecast:** This section provides a blueprint of the future application, information, communication and technology environments and outlines the high level forecast ICT program. It concludes with a summary of ICT Operating Expenditure requirements to support the planned Capital program. **Appendix D – EDPR CY 2016 - CY 2020 – Detailed Program of Work** provides detail pertaining to proposed programs, benefits to the business and customer, and analysis regarding options considered to ensure prudence of ICT expenditure are then set out.

- **Delivery:** This section details the processes and controls that AusNet Services uses to meet its delivery commitments under the current and future ICT Plans given their scale and complexity.

- **Glossary:** This section defines key terminology used to describe the program.

- **Appendix:** Lists further information used to support the proposed program.

2.4. Approach

This ICT Strategy is informed by:

- Enablement of the corporate strategic objectives and relevant business plans;

- Business needs and expectations based on the AMS;

- Customer and community needs and expectations;

- Performance of the current ICT environment;

- Opportunities and implications created by trends and emerging technologies;

- Australian Energy Regulator (AER) assessment criteria; and

- Capital and operating expenditure requirements and the prudence and efficiency of these investments.

AusNet Services performs ICT planning in line with the business planning cycles, which are impacted by:

- 5 yearly reviews in line with regulatory submission periods;

- Yearly reviews in line with yearly business plans; and

- As required to respond to internal or external changes.

ICT consults across all relevant areas of the business to obtain insight into key drivers, trends and strategic direction. External consultants and IT service providers have also been used to provide industry benchmarks and budget estimates to validate the efficiency of ICT expenditure.

The ICT Strategy is one of a number of asset management related documents developed and published by AusNet Services in relation to its Electricity Distribution network. As indicated in the below figure, detailed plant strategies, in which the ICT Strategy belongs, informs both the AMS and Asset Management Plan (AMP) of the required capital and operational programs needed to achieve the long-term objectives of the Electricity Distribution network.

Figure 3 – AMS Document Interdependencies

[C-I-C]
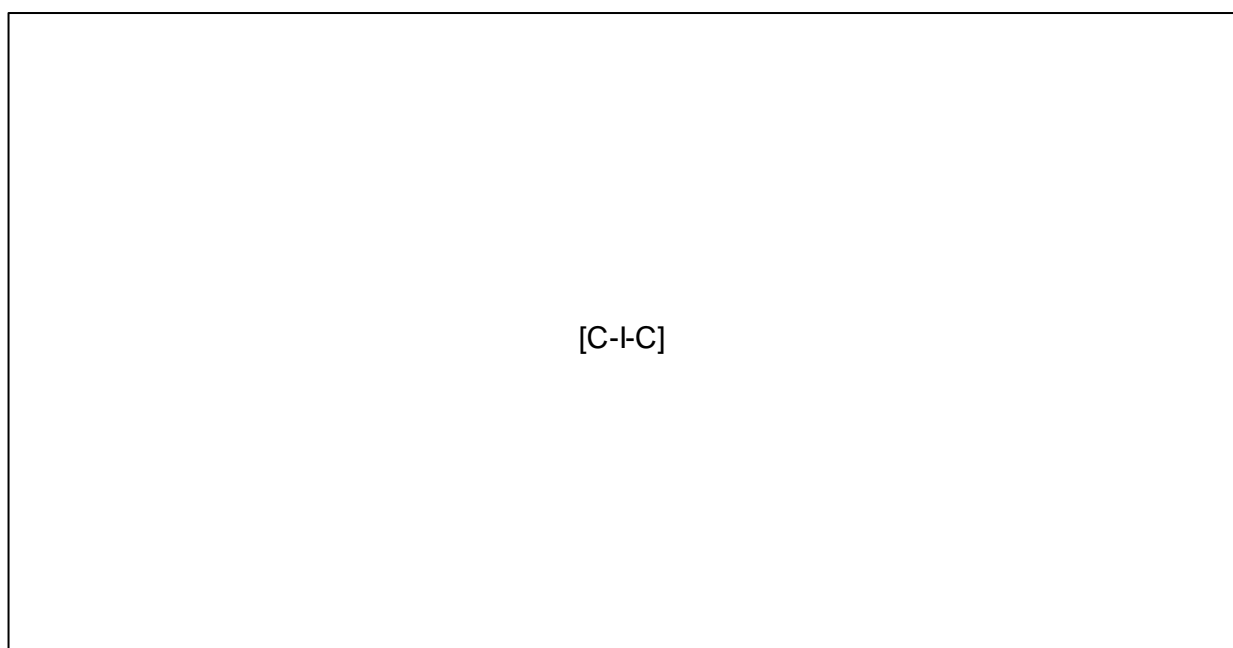
3.   ICT Capex in Context

3.1.   ICT Capex Lifecycle

ICT capex, like network capex, can occur in waves. While regular replacement and upgrades are driven by technology and software obsolescence, other investments are made in response to where ICT sits in a longer term lifecycle driven by business needs.

Taking a longer term view of AusNet Services' ICT capex, it can be seen in the figure below that the profile over the 15 years covering CY2006 –CY2020 reflects different investment levels in different periods. Between CY 2006 and CY 2010, the priority was on maintaining existing ICT capability: Between CY 2011 and CY 2015, a major initiative to standardise the way in which ICT is managed and introduce new business tools required a step-change increase in Capex to establish this new capability. This peak is largely complete and the forecast for CY2016 - CY2020 sees capex dropping back down.

Figure 4 – 2006 - 2020 ACTUAL and FORECAST CAPEX

[C-I-C]
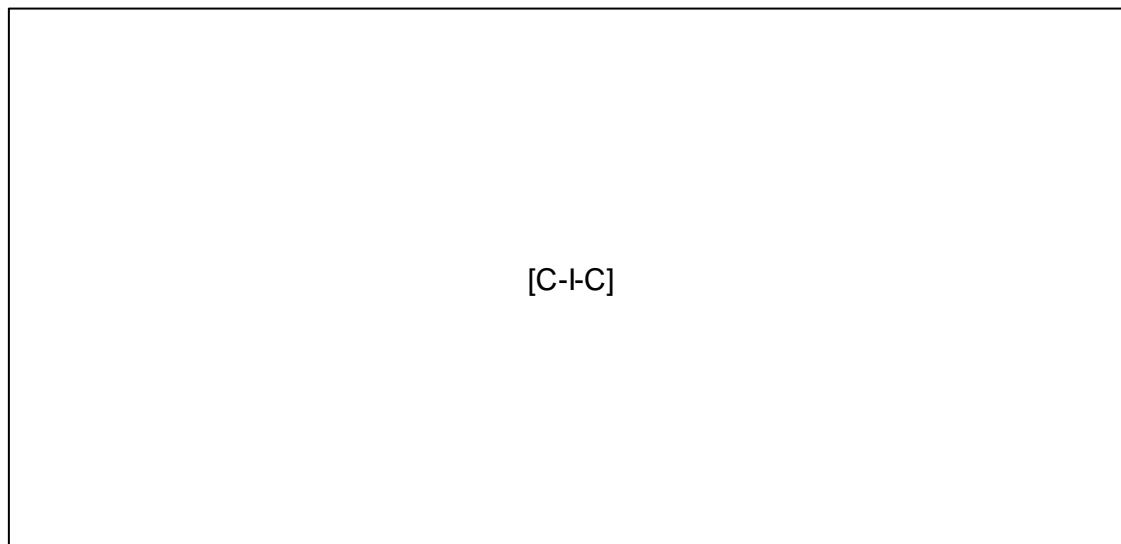
These waves of ICT capital investment occur in all businesses at different times depending on the state of their assets and the needs of the businesses. The AER has acknowledged this issue when it noted:

> *"The AER considers the variability of the Capex amounts in this category [Non-network IT] relates to the periodic need to upgrade and/or replace assets. That is, although it may be desirable to upgrade IT hardware and software every 5 years, businesses may continue to utilise these assets as long as they are able to be operated and maintained without compromising customer service. As such, the historic trend cannot completely determine future requirements."[1]*

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[1] Australian Energy Regulator (AER), (2010). *Draft Decision, Victorian Electricity Distribution network service providers, Distribution determination 2011-2015, (public version).* p. 399.

3.2. Evolution of ICT at AusNet Services

AusNet Services' ICT has evolved over time in response to the changing needs of the business as well as developments in the operating environment and technology.

AusNet Services' ICT programme for the period CY2011 – CY2015 has been focused on establishing a managed environment for the delivery of IT and communications services. Prior to this period, the focus of ICT was maintaining the disparate legacy IT systems resulting from the merger of TXU and SPI PowerNet and shifting from a lease model to an own-operate model. IT investments at this time were aimed at managing the level of risk, reliability and security required by the business functions.

For the CY2016 - CY2020 regulatory period, AusNet Services is focused on modernising its applications: the tools that ICT provides to support electricity distribution business processes. This involves completing the modernisation of these applications and retiring those that they replace. Once this change is complete, it is expected ICT costs will be contained notwithstanding the increased complexity of the business environment and the requirements it places on ICT.

Forecast investments are also aimed at readying AusNet Services to evolve in response to the expected business environment post CY2020; that is, a more uncertain and complex electricity environment with consumers' investment in disruptive technologies such as local solar PV generation and battery storage significantly impacting the business. Sound information technology will be critical to supporting AusNet Services' increasing role in balancing residential generation and supply of electricity with residential demand. The modernised ICT environment established in CY2016-CY2020 is intended to provide the basis to enable the business to deal with the uncertain future.

Table 1 – AusNet Services' Transformation of ICT Environment

	2006-2010	2011-2015	2016-2020	2021-2025
Business environment	Stable & predictable	Changing	Uncertain and more complex	Major disruption
AusNet IT Theme	Maintain IT	Manage IT	Modernise Business Tools	Enable Business Transformation
Initiatives	• Support inherited (fragmented) IT environment • Limited IT infrastructure consolidation & modernisation	• Formal service management • IT Infrastructure modernisation • Initial IT application modernisation	• Finish IT application modernisation • Pilot business deployment of new capabilities • Retire legacy IT environment	• Full-scale rollout of new IT-enabled business model • Condition-responsive electricity network management • Electricity capex optimisation • Realtime, optimised electricity business decision making
Benefits	• Continuity of IT services	• Risk-managed IT • Secure IT • Reliable IT	• Flexible IT • Controlled IT cost	• Controlled business costs • Dynamic business environment managed

4. 2011-15 Historic CAPEX

4.1. Actual Capex against regulatory allowance

AusNet Services' actual (and estimated) ICT capex for the current regulatory period is $[C-I-C]. This includes $[C-I-C] of costs related to SCADA Master Station IT which AusNet Services has historically reported separately, but from 2016 onwards will be rolled into general ICT.

Table 5 – CY 2011-CY2015 actual ICT capex against regulatory allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds ($, nominal)	[C-I-C]	[C-I-C]	[C-I-C]

Overall, ICT capex was $[C-I-C] ([C-I-C]%) greater than forecast.

The overspend was due to three main initiatives: Network Management Automation (NMA), Advanced Metering Infrastructure (AMI) and Asset and Works Management (EAM/ERP). These projects and their final costs are explained in more detail below.

4.1.1 Projects delivered in CY2011- CY2015

EAM/ERP

The implementation of the core EAM/ERP solution is the cornerstone investment of AusNet Services' strategic enterprise approach to modernise and transform the ICT applications that support the electricity distribution business.

AusNet Services' project to implement a single enterprise-wide EAM/ERP solution consolidates multiple initiatives and minimises overlaps across the portfolio. The core EAM/ERP solution framework will enable the business to:

- Transition to more efficient, effective and sustainable operating model; and
- Better leverage ICT investments across the enterprise.

The EAM/ERP system is an integrated solution, providing a fit-for-purpose platform, using SAP, to meet current and future business and customer needs. It enables cost-savings through consolidation and reduced complexity; reduce the risk of disparate, isolated legacy ICT systems and establishing a single source for all key asset data.

The initiative is on track to commission the core ERP platform in 2015 and progress to date includes the successful design, build and test phases of the solution, the preparation for change through the establishment of process and data governance, and the execution of a number of efficiency and practice reviews.

Upon successful delivery of the full scope of work, the EAM/ERP solution will:

- Improve the customer experience in dealing with all aspects of AusNet Services' business portfolio;
- Improve employee engagement by simplification and streamlining of business processes and system to perform daily tasks;

- Develop internal capability through direct involvement and up skilling of staff to ensure they are suitably informed, trained and disciplined in using new processes and systems resulting in benefit realisation;

- Deliver sustainable operating cost reductions through more efficient and effective asset management and supporting processes, thus containing price growth;

- Improve current information management and manage system support risks by implementing a single enterprise asset management, resource management, financial management and procurement system integrated with existing core systems, thus generating significant service reliability; and

- Allow end-to-end process coverage through to field-based staff by implementing an integrated mobility platform.

AusNet Services minimised overlaps and duplication of effort across the portfolio because the EAM/ERP solution consolidates and delivers objectives from a number of individual projects from five programs of work defined in the EDPR CY2011 - CY2015 (illustrated in the table below).

Table 6 – EAM/ERP Solution Components

Program of Work	Project Name
Asset and Work Management	Enterprise Asset Management Ph. 2 – Distribution Electricity
	Enterprise Asset Management Ph. 3 – Spatial Asset Management
	Enterprise Asset Management Ph. 6 – Upgrade and Functional Extensions
Workforce Collaboration	Mobile Computing Ph. 2 – Works Management
	Mobile Computing Ph. 4 – Functional Extensions
Enterprise	Enterprise HR and Payroll Upgrade
	Enterprise Financial Upgrade
	Enterprise Data Analytics
	Reporting Dashboard
IT Infrastructure and Operations	Unix Management Tools
	Unix Server Hardware Refresh

Following go-live of EAM/ERP, investments in the program will focus on delivering planned efficiencies and benefits realisation activities; preparing for re-alignment of the business operating model based on resulting process and system changes; and implementing minor enhancements and improvements to maximise and leverage the value of the original investment.

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Network Management Automation Program (NMA)

The objective of the NMA program was to invest in AusNet Services' aged network management systems. The benefits planned for the NMA program were:

- Reduce safety hazards to the public during adverse weather (storm) events resulting from faster fault identification and isolation;

- Improve the quality of power supplies relating to voltage levels, phase unbalance (applicable to three phase loads) resulting from the future application of analytics (using increased network/asset visibility);

- Reduce public risks associated with distribution asset failures achieved through improved real-time asset condition knowledge arising from the integration of real-time operational and asset related information;

- Improve utility to customer interfacing during planned and unplanned network activity and resulting from improvements in auto voice messaging and more efficient manual action enabled by the DOMS information;

- Reduce carbon impact resulting from a lowering of the distribution network losses achieved through more efficient and integrated network voltage regulation; and

- Lower bushfire risks through availability of automated control routines that facilities customised network configuration on days of high bushfire risk.

NMA was delivered at nominal $[C-I-C]. The original forecast cost of $[C-I-C] was underestimated due to inadequate scope. That is, detailed analysis revealed that the interdependence of the systems and integrations required to fulfil the requirements and achieve benefits were considerably more complex than initially estimated. The project scope was therefore re-assessed and re-costed to deliver the required functionality and integration to support the increasingly dynamic environment in which AusNet Services is required to manage distribution networks.

This analysis also compared the estimated costs with other Distributors[2] with similar customer profiles and functionality requirements. This exercise identified that the re-forecasted costs to implement was comparable to those of other distributors, and that the level of integration between legacy systems and new distribution management systems in AusNet Services' NMA implementation is more complex and costly than that of other Distributors.

Advanced Metering Infrastructure Program (AMI)

The cost related to the AMI program was higher than originally forecasted, therefore the portion attributable to the Electricity Distribution network, according to the approved cost allocation model, also contributed to the variance. The AMI project costs (and its components) have been the subject of the AER's determination on AMI cost recovery, and the allocation of these costs between the regulated distribution business and the AMI project were also determined in this process[3].

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[2] AusNet Services, (April 2010). *Network Management Automation (NMA) - Board Paper*, p. 8 (confidential).

[3] Australian Energy Regulator (AER), (Dec 2010). *SP AusNet Electricity Distribution Cost Allocation Method*, p. 8 (public version).

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Other ICT Capex

The remainder of the ICT capex spent in CY2011- CY2015 was to deliver the following initiatives:

- **Replacement, consolidation and/or integration of systems to support multiple business functions.** Similar to the EAM/ERP initiative, strategic integration of systems has resulted in a single, holistic view of key areas of the business. This includes integrated view of all program/project management activities, and real-time, geography-based view and remote management of the network. AusNet Services also put greater emphasis on agility and scalability of platforms and systems to accommodate future capacity growth.

- All of this has enabled the organisation to increasingly automate and standardise processes and workflows, effectively and efficiently manage activities and works, centralise and integrate information, and extend capabilities to meet business needs.

- **Remote, timely and secure communication and access to centralised documents and integrated data.** This enabled AusNet Services' employees to access reliable information, in a timely, structured and consistent manner, increasing mobile workforce collaboration and data quality.

- **Enhanced data warehouse capabilities, and better data visualisation.** This enabled AusNet Services to make more informed decisions, to store greater volumes of data for cross-functional analytics and reporting and to respond more quickly, at lower cost to corporate, operational, compliance and regulatory reporting requirements.

- **Replacement, rationalisation and/or extension of IT infrastructure assets.** This enabled AusNet Services to defer capital spend and reduce operational spend, minimise asset failure and operational risks, refresh and uplift its IT infrastructure to be flexible, robust and extensible, and better support changing business requirements.

For further information on the current period program please refer to **Appendix B – EDPR CY 2016 - CY 2020 – Detailed Historical Programs.**

Benefits delivered by current period investments

ICT investments over the CY2011-2015 period have enabled and supported innovation and integration. This has delivered benefits to consumers by containing future costs and ensuring network reliability and safety even as the operating environment becomes more complex. These programs include:

- Network automation, including a new advanced network management system and distribution feeder automation. This has resulted in improvements in reliability and response times for emergency maintenance.

- The financial and asset management systems linking financial, GIS and asset management information. This has enable improvements to asset management and supported information provision into regulatory processes without requiring step changes in opex.

In combination, the investments made in the CY2011 - CY2015 EDPR period represent a significant and successful step in delivering an enterprise-wide ICT approach and capability that is aligned with business and customer needs, sustainable, maintainable and efficient manner.

Moving forward, AusNet Services will continue to leverage the investments made in core information technology foundations and capabilities to meet existing and future customer, regulatory and other stakeholder obligations. Furthermore, AusNet Services will seek to reduce ICT capital requirements and to control ICT operating expenditure in future regulatory periods.

5. Benchmarking

Cost category analysis has highlighted to AusNet Services that its ICT costs appear relatively higher than that of its peers. Analysis of AusNet Services' average ICT totex (capex plus opex) over CY 2009 - CY 2013 shows that AusNet Services' ICT cost of $[C-I-C] per customer is higher than the industry average of $[C-I-C] per customer, as shown in the figure below.

Figure 7 – CY 2009 – CY 2013 Average ICT Totex per Customer $nominal

[C-I-C]
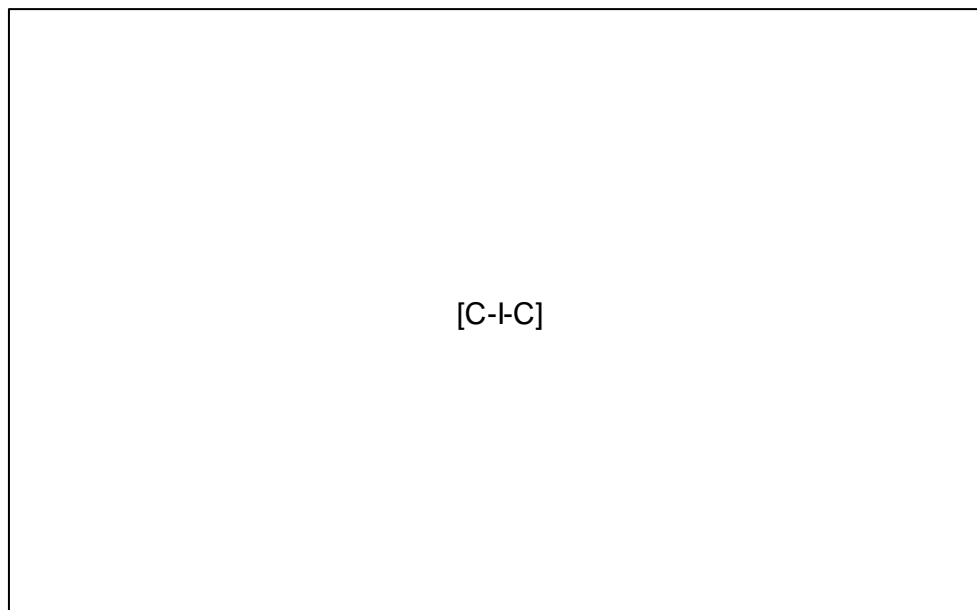
Source: AER RIN data, Jemena not shown as data unavailable

Note – Totex is an appropriate measure of IT costs as it is neutral as to whether a business utilises opex (eg: infrastructure as a service (IAAS)) rather than capex (eg: own and operate their own IT infrastructure) for its ICT services.

The two main drivers of AusNet Services' ICT costs are:

- Our current position in our ICT capex lifecycle;
- The increasing integration of ICT with network management.

The growth in ICT costs since 2006 reflects where AusNet Services is in its ICT evolution, as summarised in section 4.2 above.

AusNet Services' capital spend is expected to decrease and progressively normalise toward industry average as the business continues its enterprise-wide transformation journey. Having peaked in 2013, it is expected that capital spend on ICT will fall from $[C-I-C] in 2013 to $[C-I-C] in 2015, then stay between $[C-I-C] until 2020. This is because the focus of initiatives and activities will shift from heavy capital investments to realising planned and sustainable efficiencies and reducing operational expenditure for the long-term.

For the CY2016-CY2020 regulatory period, AusNet Services is focused on modernising its applications; the tools that ICT provides to support electricity distribution business processes. This involves completing the renewal of these applications and retiring those that they replace. Once this change is complete, it is expected future ICT costs will remain steady notwithstanding the increased complexity of the business environment and the requirements it places on ICT.

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This evolution is not atypical for distribution businesses. The figure below shows how variable ICT capex can be and how much it changes depending on the point at which a firm is placed in its ICT evolution.

Figure 8 – Comparison of historical ICT Capex across the NEM ($nominal, '000s)

[C-I-C]
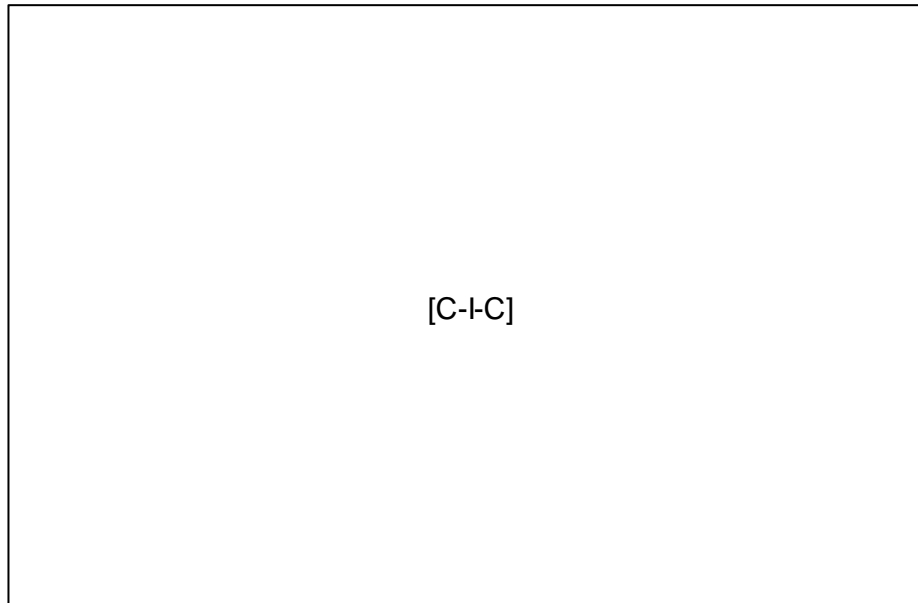
Source: AER RIN data

The firms shown in green have clearly decreased ICT capital investment over the five year period, while in contrast firms in blue (including AusNet Services) have been increasing capex over the period. The ICT capex of the firms shown in grey peaked in the middle of the period (presumably following the completion of major projects) and then fell back to lower levels following that peak.

This demonstrates that a direct comparison of ICT capex levels between firms in any single year or regulatory period is inherently difficult.

ICT and lower overheads

ICT investments delivered over the CY 2011- CY2015 period have enabled AusNet Services to deliver increasing value from the core business. For example, a sophisticated network outage management system allows better coordination, planning and scheduling of outage management events, improving responses to customer requirements, whilst saving on administration, control and service delivery costs.

AusNet Services uses ICT to drive lower corporate and operational costs as shown in AusNet Services having the second lowest total overheads per customer in the NEM at $[C-I-C] per customer, which is nearly half of the industry average of $[C-I-C] per customer.

Figure 9 – CY2009 – CY2013 average total overheads cost per customer $nominal

[C-I-C]
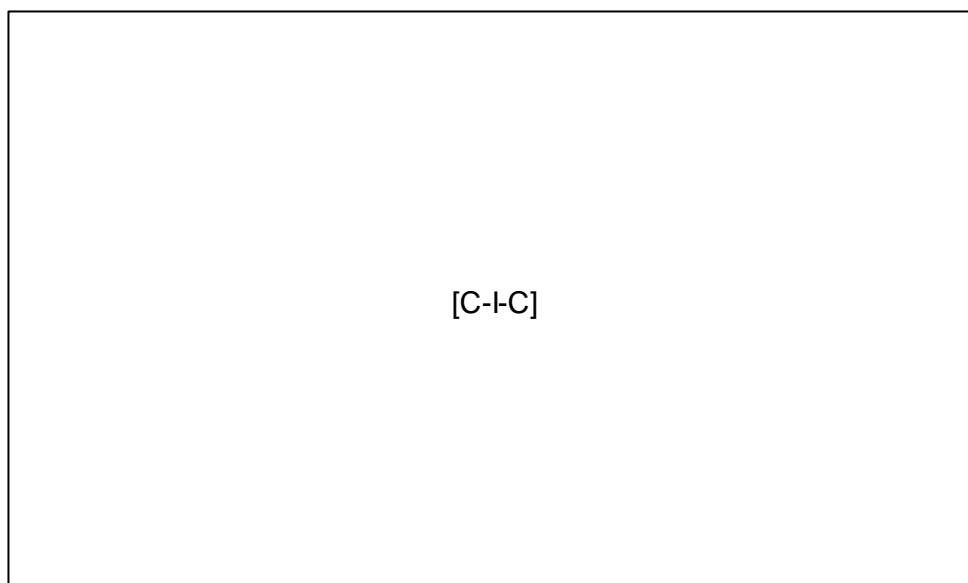
Source: AER RIN data. Overheads are 2009-13 average

It is expected that once the EAM/ERP project is completed, embedded, and extended to its natural potential, AusNet Services will have access to better and more timely financial and asset management information. This will be leveraged to enable AusNet Services to continue to deliver low overhead costs.

Response to benchmarking – Controlling ICT costs

AusNet Services' ICT capex is forecast to decrease over the next regulatory period and progressively normalise as the business continues its enterprise-wide transformation journey.

Despite the lower capex forecast for the CY 2016 - CY2020 regulatory period, ICT cost comparisons have highlighted the importance of sound programme execution and system rollout techniques. AusNet Services is working on improving these capabilities through a range of initiatives:

- Project management methodologies consolidated through an Enterprise Project Management Office (EPMO);

- Enterprise portfolio management (EPPM) and staged funding for major projects; and

- Updated Project Delivery model and System Integrator panel for ICT project delivery.

The successful progress of the large and complex EAM/ERP initiative and the forecast commissioning of the core solution is evidence of the effectiveness of these initiatives to manage and control the execution of ICT Capex. Further detail on these processes is provided in *Appendix A – EDPR CY 2016 - CY 2020 – Methodologies and Processes.*

While AusNet Services expects some ICT opex increases which are related to the forecast capex program, it is not including an ICT step change in forecast opex as it is proactively seeking to control ICT opex costs to ensure they do not increase above current levels. These costs are explained further in Section 6.1.

6.   Forecasting Methodology

AusNet Services uses a three-stage delivery model for ICT across all its business activities, the first stage of which is the creation of a Technology Master Plan. The allocation of costs in this Plan to the regulated electricity distribution business is the basis of the ICT forecast for the EDPR.

6.1.   Approach and Process

Figure 10 – Development of Technology Master Plan

The figure above outlines the five stages in the development of the Technology Master Plan on which the EDPR budgets are based.

6.2.   Business Need

The statement of requirements for ICT is derived from an analysis of the strategic drivers on the AusNet Services' business and their implications for risk management.

6.2.1   Objectives

AusNet Services has key network objectives that guide how the Electricity Distribution network is operated and maintained. In a large part this reflects the regulatory obligations and prudent, efficient and sustainable management. Achievement of these objectives ensures the long term health and sustainability of the network.

These objectives are:

- Meet or manage the expected demand for standard control services over that period;

- Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

- Maintain the quality, reliability and security of supply of standard control services; and

- Maintain the reliability, safety and security of the distribution system through the supply of standard control services[4].

These objectives are in line with the capital expenditure objective and criteria under the National Electricity Objectives (NEO) which are:

"…to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –

- *Price, quality, safety, reliability, and security of supply of electricity; and*
- *The reliability, safety and security of the national electricity system."[5]*

6.2.2 Drivers on the ICT function

The key implications of these objectives on ICT are:

- Supporting the achievement of corporate, business, network and asset strategies;

- Reducing ICT Capex requirements as compared to previous periods while realising the full value of existing investments in terms of performance, resilience, reliability and risk;

- Controlling ICT Opex and delivering an efficient ICT operation while continuing to maintain appropriate standards of delivery and service;

- Managing the risk of ICT changes in the business environment such as increasing customer expectations;

- Adjusting to an environment of lower aggregate consumer demand;

- Technology environment impacts such as increased IT/OT convergence; and

- Significantly increased data management requirements resulting from smart meters and other sensors.

ICT must also consider external drivers that impact and influence the business. Associated implications and outcomes as a result of external drivers are tabulated below.

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[4] Australian Energy Market Commission (AEMC), (Feb 2015). National Electricity Rules Version 68 – Section 6.5.6, p. 660.

[5] Australian Energy Market Operator (AEMO), (1996). National Electricity (South Australia) Act 1996, p. 38, (public version).

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Table 11 – AusNet Services ICT External Drivers

External Drivers	Trends	Implications and Outcomes
Industry Regulations and Requirements (Regulatory Information)	• The AER now publishes Annual Benchmarking reports[6]. • Reports which rely upon detailed benchmarking data from industry. This drives systems to deliver more accurate, relevant and timely data. This data informs regulatory decisions and is made publicly available to a wide range of stakeholders.	• AusNet Services will improve data quality and analytics and reporting capabilities as outlined in the previous section. • This will enable AusNet Services to respond more quickly to compliance and regulatory requirements, through more accurate, timely and relevant data and reporting generation for both internal and external stakeholders.
Environmental & Climate Issues	• Bushfires in areas with network lines managed by AusNet Services have represented key challenges to the business as they cause prolonged interruptions to power supply and risks to employee and community safety. • Customers have also indicated through engagement processes, that expenditure in safety and specifically bushfire measures is something that should be implemented as a clear priority.[7]	• AusNet Services will enhance and deliver capabilities to manage various types of faults that could cause safety issues to the public, damage to either AusNet Services' or customer's assets or parts of the network. • This will enable AusNet Services to enhance public safety and minimise risk of bushfires. Ultimately, they will enable the business to comply with regulatory requirements, mitigate litigations and class actions, and protect company credibility and reputation.
Customer Behaviour	• Consumer response to increasing energy prices, energy efficiency measures, economic conditions, emerging technologies, and improved building efficiency continue to reduce energy consumption per customer on the electricity networks. • This decreasing trend in consumption has been occurring since 2010 and is forecast to continue as the low cost of PV energy (solar) systems and reducing cost of energy storage both have an impact. • Reducing consumption and time of use tariffs lead to increasing prices.	• AusNet Services will give priority to developing lower cost and shorter life assets, better targeted network safety and asset replacement programs, and developing a deeper understanding of the impact of localised generation coupled with energy storage through trials and development of low-voltage network models. • This will enable AusNet Services to efficiently prioritise capital programs and deliver sustainable operating cost reductions and strategically address customer behavioural changes, thus containing price growth. • Invest in tools to support network management of two way energy flows.

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[6] Australian Energy Regulator (AER). 2014 Annual Benchmarking Report – November 2014, (public version).

[7] Colmar Brunton Research. (12 Jan 2015). *AusNet Services' Customer Engagement Research Draft Report*, p. 10.

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External Drivers	Trends	Implications and Outcomes
Industry Regulations and Requirements (Customer Interaction)	• AEMC's reviews resulted in significant reforms to the National Electricity Market (NEM), where there are more options for consumers to understand and choose how they use electricity. • Customers involved in Customer Engagement programs indicated they were keen to engage with AusNet Services' innovation, demand management and network management programs. There was also a strong demand for information related to these areas.[8] • Increases in consumer power and right to decision-making regarding their consumption, impose new demands related to network management, metering and customer reporting. As a result, this adds greater importance on: • The provision of highly resilient, reliable and quality supply, • The capacity to effectively manage two-way customer interactions.	AusNet Services will: • Ensure integration, automation and consolidation of key data sources and improved visualisation of near real time network performance. • Establish a centralised system to store end customer information and expand customer engagement by providing access to increasing digital capabilities This will enable AusNet Services to: • Ensure network reliability and performance by automating network monitoring and responses. • Manage existing and anticipated regulatory changes and meet increasing customer demand in communication channel and information access.

6.2.3 Customer Engagement and Consultation

As part of developing our Electricity Distribution Regulatory Proposal, AusNet Services consults to ensure that we understand and continue to meet our customer needs and priorities.

While customer engagement has always been part of our Regulatory Proposal process, the forthcoming regulatory period will see AusNet Services build engagement through increased consultation. Broadly, we seek to inform customers about our work, consult on issues in which opinions differ, involve customers in shaping our future and collaborate on issues of concern.

Our initial customer consultation work has helped us identify directions and priorities for our upcoming electricity distribution revenue proposal. This information is being used in the development of our future plans, acting as a source of new ideas and as additional criteria for prioritising the projects we include in our proposal.

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[8] AusNet Services. 2015. *Customer Engagement Program – Findings from initial consultation phase – What our customers are telling us*, p. 8.

6.2.4   Risks

AusNet Services uses a formal Risk Management approach to identify and manage risk as a means of providing customers with superior network and energy solutions. Details of the approach are set out in **Appendix A – Methodologies and Process.**

For the period CY 2016 – CY 2020, the impact of changes to the business environment has been assessed using this approach. Summarising the themes identified yields five "Risk Themes" with implications for ICT:

Table 12 – AusNet Services ICT Risk Themes

Risk	Consequences
Risk Theme 1: Deteriorating reputation due to poor customer experience driven by inefficiencies.	Loss of customer trust and support for future capital investment.
Risk Theme 2: Failure to meet regulatory requirements and standards to meet network up time (e.g. SAIDI / SAIFI).	Financial penalties and/or loss of licence, and major increase in customer power quality complaints, damaging corporate brand and customer satisfaction.
Risk Theme 3: Legacy systems reach end of life and maintenance / support cease being provided by vendors.	Systems become susceptible to security and reliability compromise, and run into issues (e.g. bugs, cyber-attacks) that would otherwise be remediated with the release of security and software patches and service packs by the vendor. If a system fails, recovery could be lengthy and impact day to day operations. Unmaintained, out of date system is a customisation, increasing maintenance and support costs. Systems become non fit for purpose and cannot adequately support the organisation.
Risk Theme 4: Increased cost resulting from inefficient processes to store, manage and retrieve information, as well as manage governance, security and risks/hazards.	Increased cost to serve represents higher costs for consumer and/or reduced benefits for the same price. Inefficient processes also increase the risk of AusNet Services being able to fulfill their customer, legal and regulatory stakeholder obligations.
Risk Theme 5: Inefficient monitoring and investigation of safety incidents	Compromised workforce and community safety.

6.2.5   Benefits

The AusNet Services Benefits Driver framework enables us to identify, assign, and measure the benefits of a particular Initiative against our Strategic Objectives. It allows us to identify which value drivers apply to the initiative and quantify their contribution and ensure their alignment, forming the basis for ongoing measurement and assessment and assurance that the identified Benefits are actually achieved.

The Benefits Driver framework is a forward looking approach to planning, prioritising, and optimising Initiatives that gives us ability to measure results in a standard, transparent manner. This enables us to assign accountability, maintain alignment of goals, and address changes within the Initiative lifecycle to maximise results.

The ICT proposed program is expected to deliver tangible and intangible benefits to the wider AusNet Services electricity distribution business and its customers as described in the below figure.

Figure 13 – ICT Capex Plan CY 2016 -– CY2020 - Benefits Drivers9

BENEFITS		ICT Strategic Initiatives			
		Leverage Core	Information Enablement	Communications Enablement	Security Enablement
Improved customer satisfaction and brand recognition	Increased customer satisfaction	✓	✓		
	Reduced customer complaints	✓	✓		
Improved workforce and public safety	Reduced number of safety incidents	✓	✓		
	Improved employee retention	✓	✓		
Improved operational efficiency	Improved productivity	✓	✓	✓	
	Enhanced decision making	✓	✓		
	Reduced time on process	✓	✓	✓	
Reduced operational and regulatory risks	Reduced loss of public property	✓	✓		✓
Improved regulatory compliance	Increased ability to comply with regulatory requirements	✓	✓	✓	✓
	Increased regulatory and political influence		✓		
	Increased compliance with standards	✓	✓	✓	✓
Improved asset, network and service reliability	Increased asset utilisation	✓	✓	✓	
	Reduced asset failures	✓	✓	✓	
	Reduced truck rollouts	✓	✓	✓	
	Reduced unplanned outages	✓	✓	✓	✓
	Improved asset replacement optimisation	✓	✓		
Controlled capital expenditure	Improved capex investment decisions	✓	✓		
Controlled operational expenditure	Improved opex spending decisions	✓	✓		
Improved growth and earnings	Increased price of services	✓	✓		
	Increased growth and diversity of business	✓	✓	✓	

Leverage Core	Information Enablement	Communications Enablement	Security Enablement
Consolidate & Simply *Process Integration* *Extend Core* *Technology Lifecycle Management*	*Improve data quality* *Fit for purpose* *Enhanced Decision Making & Market Opportunities* *Consistent Single Source*	*Refresh* *Service Orientation* *Optimise* *Consolidate*	*Cyber-Security Threat Identification* *Cyber-Security Threat Protection* *Cyber-Security Threat Detection* *Cyber-Security Threat Response*

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[9] AusNet Services (2015), *Appendix A Technology Plan Summary*, p. 13.

6.3.   Options Investigation

Just as changes to the business environment lead to new business risks, cost effective new solutions in the ICT industry offer alternative approaches for mitigating those risks and delivering ICT capability to the business. For the period to 2020, nine emerging themes will facilitate cost-effective delivery of ICT to AusNet Services:

Figure 14 – Market, technology and regulatory forces [10]

These emerging trends are evaluated alongside existing technologies and practices to identify the most cost effective options for delivering ICT solutions to the business at an appropriate level of risk and service.

For further information on strategies that underpin the ICT Strategy please refer to **Appendix C – EDPR CY2016-20 ICT Strategic Approach.**

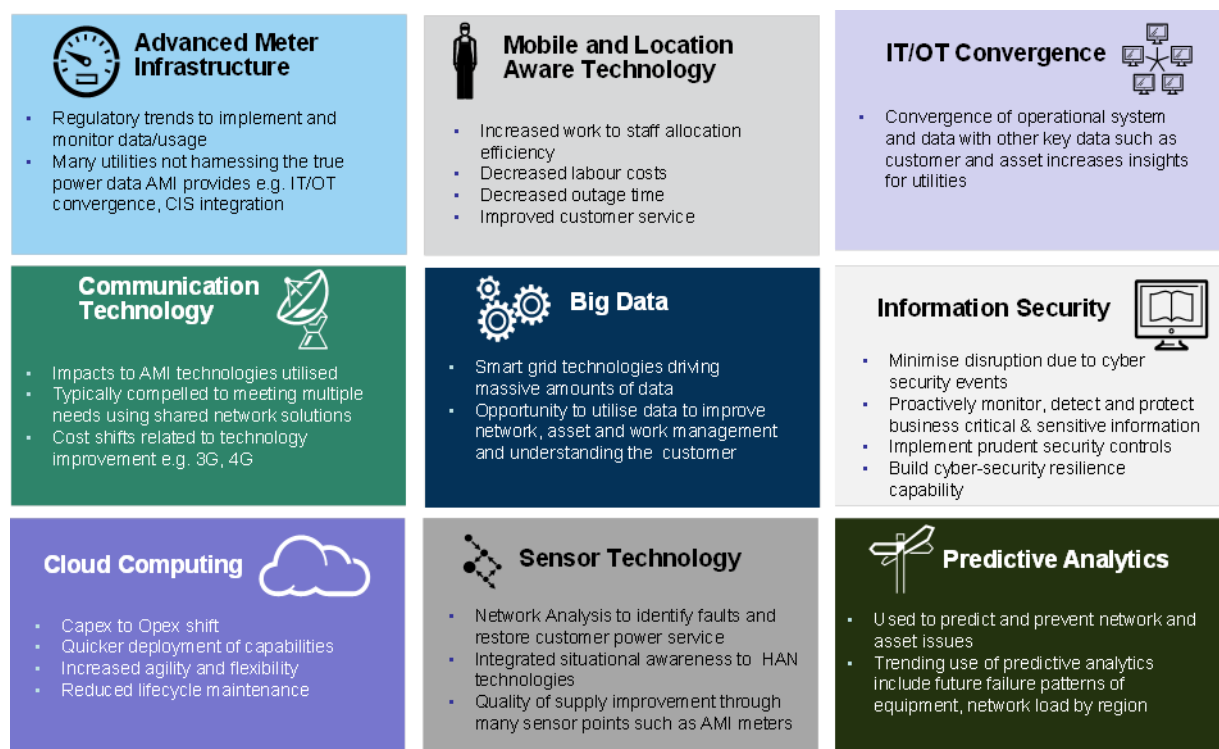[10] AusNet Services. (2015), *Appendix A Technology Plan Summary*, p. 5.

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6.4. Gap Analysis

ICT at AusNet Services is in the later stages of a transition from the capability and delivery model inherited from the former owners of the distribution business to a formally managed environment in which the cost and level of ICT services is deliberately aligned with the value of the business outcomes they support.

Table 15 – Current to Future State – Gap Analysis

	Current State	Future State
Projects	Core foundation Network Management systems in place during the period integrating outage management, spatial information and SCADA. Core foundational EAM/ERP platform established during the period. Core foundational metering infrastructure in progress.	Commence enterprise approach to information management, reporting and analytics to derive value from new core platforms. Additional functionality added to EAM/ERP solution and process commenced to embed platform into the organization. Development of a customer centric utility utilising a customer relationship management system.
Infrastructure	Legacy infrastructure retired. Virtualisation used for WinTel Server Management in 80% of fleet. Deliberate ageing of infrastructure assets to extend lives and free up ICT organisation capacity to deliver projects. Formal service management infrastructure established and operational. Formal lifecycle management policies in place.	Lifecycle refresh caught up and maintained. Server virtualisation to 95%. Augment Security capabilities to mitigate new threats. Building Infrastructure as Service capabilities (IaaS) to scale as and when required. Early adoption of IaaS in storage and development environment capabilities.
Applications	Core enterprise application frameworks established for project management, reporting, email, content management and customer information systems. Core enterprise applications in later stages of commissioning for network management, AMI, and EAM/ERP. Planning for enterprise solutions for information management and analytics.	Core enterprise application frameworks commissioned for entire suite of business. Supplementary capability deployed using these foundations (examples). Supplementary enterprise capability tools deployed for analytics and decision support. Analytic tools deployed and being used (examples).

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6.4.1 Current State

Throughout the course of the previous period AusNet Services recognised the increasingly critical and changing role of ICT in a rapidly evolving environment, characterised by volatile and falling aggregate demand, increased network complexity (e.g. distributed electricity generation) and increased customer expectations (from passive to active consumers). Specifically, the business was increasingly reliant on ICT to drive productivity; to help integrate the traditional silos of asset, network, field and customer; and to supply systems that were:

- Appropriately reliable and resilient (given their increased mission critical nature);
- Extensible and agile (able to respond and evolve over time, more quickly and at lower cost than legacy systems);
- Maintainable in an Opex and Capex constrained environment.

The current ICT environment is the result of a strategic response to support these outcomes effectively and cost-efficiently over time. Investment and effort has focussed on developing an enterprise foundation to leverage economies of scale across the three networks.

AusNet Services therefore prioritised the core asset & network systems with three foundational enterprise programs:

- Enterprise Resource Planning / Enterprise Asset Management (EAM/ERP) solution to provide a single source of truth for asset, work, people, supply chain and financial data, allowing for better management and maintenance of the RAB;
- Network management systems to improve network operations, reliability, service (including outage management and spatial systems); and
- Advanced Metering Infrastructure to improve customer experience, interaction and communication.

All non-core and dependent investments were deferred to prioritise the enterprise foundation investments and minimise capital requirements during the period (e.g. enhanced Business Intelligence capabilities, drawing management and Customer Relationship Management). In addition, asset lifecycles were carefully reviewed and IT asset refreshes were delayed based on risk assessments and mitigations. Additional effort was aimed at reducing the number of obsolete systems and extracting cost efficiencies through consolidation.

More detailed information supporting AusNet Services' current state ICT environment is further described in **Appendix B – EDPR CY 2016 - CY 2020 – Detailed Historical Programs.**

The accrued effort and consolidation has left the current IT landscape with the following critical issues and challenges:

IT Challenges:

- Fragmented data sets within remaining legacy systems across the enterprise;
- Inability to leverage from data that exists in operational and external systems;
- Degrading mobile solutions in each business function;
- Duplicated data warehouse platforms;
- Physical separation of the Energy Management System (transmission) and SCADA (distribution) control networks from other information networks;
- Siloed security architecture.

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Business Implications:

- Complex and difficult environment to conduct analysis impacting the timeliness of information for decision making;

- Business unit centric analytics and reporting;

- Reactive management of assets and the network;

- Unmanageable manual paperwork created in the field;

- Completion of administrative tasks (e.g. time sheeting) require field workers to return to the depot;

- More emphasis required on customer solutions;

- Tactical business line solutions;

- Internally focused enterprise services;

- Reactive security incident management;

- Limited security threat intelligence.

The table below describes ICT's response to these drivers.

Table 16 – AusNet Services ICT Responses to Drivers

Internal Drivers	Trends	Implications and Outcomes
Improve Data Quality	• Data Quality – achieved through the application of appropriate systems, processes, governance and controls – is crucial to the effectiveness of many ICT applications and is a pre-condition to valuable reporting and analytics. By championing and supporting an enterprise data management initiative, this sets a strategy to support the use of information as a competitive asset in the organisation[11]. • Smart technologies and sensors in particular have significantly increased the amount of data and control options available to the business. However, much of the value of this data lies in the ability to process, integrate and interpret the data to provide meaningful, timely and accurate information to decision-makers. • There is an increasing need to be able to store and access data (often in the form of records) for compliance and reporting purposes.	AusNet Services will improve data quality by: • Appropriately storing, securing and managing data throughout its lifecycle. This applies to both structured and unstructured data, whether it is used for operational decision making or compliance and reporting purposes. • Further integration and consolidation of data sources • Extending the remediation and cleansing of data beyond the scope of data elements related to current projects and systems to provide quality enterprise wide data sources. This will enable the business to: • Ensure a consistent, secure and current view of all data through the organisation, and therefore manage large disparate data sources and provide a single source of truth. • Ensure that data, both current and future, is leveraged through new technologies and subsequently used for analysis such as predictive analytics, data profiling and classifications.

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[11] Gartner. (July 2011), *Advancing Data Management Maturity Key Initiative Overview. G00214485*, (confidential), p. 2.

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Internal Drivers	Trends	Implications and Outcomes
Enhanced Decision Making	• Providing decision makers with enhanced information based on large volumes of disparate data to enable real time assessment and subsequent decisions. • Analytics and Reporting are becoming increasingly powerful tools that can enable proactive behaviour and more informed asset management and network operation. The value proposition of smart networks relies on being able to reliably and efficiently transform available data into useful information, and ultimately to produce an intelligent outcome.	• AusNet Services will extend the current analytics and reporting capabilities to utilise more data, generate more actionable insights and make the information more widely and readily available to decision makers, regardless of their location. • This will enable the business to benefit from extending enterprise business decision support tools across a broad spectrum of disciplines, including network planning, system operations, asset management, commercial management, customer relations, compliance and reporting.
Mobility	• Without mobility, there is a lack of real-time access to asset, network and customer information resulting in the use of out of date information, which has productivity, safety and ultimately customer service implications. • Mobile technologies provide tools designed to enhance efficiency and effectiveness of business processes by enabling work in the field. This results in cost savings (i.e. through reduced need to return to depots); improved data capture and quality; as well as safety and compliance benefits. • Mobile technologies promote innovation in line with latest ICT trends and organisational agility, allowing the workforce to access more information in real-time wherever they are.	• AusNet Services will take an enterprise-wide platform approach to mobility that leverages common capabilities (such as mobile device management and access management) and provide the flexibility to adapt to different types of user and use cases. • This will enable all staff across the enterprise to access information and functionality relevant to their job regardless of their location or access method, whilst ensuring appropriate safe-guards are in place for secure or sensitive data.
Technology Lifecycle Management	• As modern management systems become more highly integrated and complex, legacy IT assets are increasingly a driver of increased maintenance costs, operational risks and lost productivity. Efficient organisations are therefore actively assessing and managing both individual applications and the overall application portfolio through its lifecycle to ensure maximum return on investment across whole of life.	AusNet Services will: • Effectively manage asset lifecycles in the context of overall corporate financial resource, including appropriate asset maintenance. This can be done through practical replacement and consolidation of IT assets. • Implement appropriate information, processes and application portfolio management tools to support effective asset lifecycle management. This will enable AusNet Services to avoid increased operational expenditure and risks, and cost-effectively manage the portfolio.

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Internal Drivers	Trends	Implications and Outcomes
Enterprise Approach	- ICT and ERP systems in particular are increasingly used as tools to optimise end-to-end processes across an organisation. - This is particularly relevant in electricity distribution businesses where the core function of delivering energy reliably and cost-effectively to customers requires a complex integration of back office (e.g. finance), asset management, network management, field maintenance and customer service processes, teams and information. - Integrated systems enable a much greater degree of data acquisition, control, planning, scheduling and coordinating functionality to be realised, resulting in productivity and efficiency gains, improved network reliability and customer service.	AusNet Services will establish foundational enterprise technologies that are shared across the various functional domains and not rely on functional specific systems. This includes capabilities such as Enterprise Application Integration, Enterprise Project Management, Enterprise Content Management and infrastructure such as data centres and communications platforms. This will enable AusNet Services to: - Provide a more modern, integrated, resilient, scalable and flexible platform to support evolving customer, stakeholder and business needs. - Deliver sustainable operating costs through more efficient and effective asset management and supporting processes, thus containing price growth. - Support changes created by Data Quality and Analytics and Reporting drivers mentioned above by improving information management and subsequent data quality.
Information & IT Security	- Cyber-security is a serious and ongoing challenge for the energy sector, and cyber threats to energy delivery systems can impact national security, public safety, and the national economy. - In 2012, Industrial Control Systems Cyber Emergency Response Team (ICSCERT) reported that 41% of cyber security incidents across critical infrastructure sectors involved the energy sector, particularly electricity. [12] - As IT/OT increasingly converge, vulnerability to cyber security threats increase. This is because, unlike IT systems, OT systems have little security capabilities and with no regular and automatic updates for service packs, new releases and bug fixes – they usually run the same software as the one initially installed. - Businesses need to make OT systems more secure before merging with IT systems, or at least ensure there is a good visibility of cyber threats, and integrate security practices across IT/OT.	AusNet Services will build on security capabilities to protect the Electricity Distribution network, customer and business information. This will enable AusNet Services to facilitate smart features of the network to be developed while maintaining its security.

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[12] Industrial Control Systems Cyber Emergency Response Team. (Oct - Dec 2012). *ICS-CERT Monitor.* USA: Industrial Control Systems Cyber Emergency Response Team.

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6.4.2   Future State

Within AusNet Services the role of the ICT business unit is to support the broader business by efficiently delivering cost effective technology solutions that enable achievement of the CY2016-CY2020 objectives; to leverage, extend and improve the enterprise foundation to realise benefits.

The Electricity Distribution energy industry has increasingly developed into an arena of business and technical innovation. These ICT trends and emerging technologies need to be considered and leveraged, where it is cost effective to do so, within the ICT Program where these capabilities can provide benefit to AusNet Services, the customer, community and stakeholders.

In the coming period, therefore the key focus will be to:

- Leverage the foundation elements of the enterprise strategy;

- Extend enterprise solutions across end-to-end processes; and

- Improve enterprise capabilities in line with prudent investment decisions.

This will allow ICT to:

- Reduce capital expenditure, and control operating expenditure;

- Deliver business outcomes for customers and realise the benefits of the foundational enterprise investments;

- Optimise the IT operating model and sourcing strategies, developing capabilities and enhancing maturity as a business enabler.

The planned ICT investments enable business strategies and will therefore build on the foundational enterprise capabilities delivered in CY2011 - CY2015, focusing on customer service, customer safety, security of the distribution system, and technology that support the Electricity Distribution Network (assets, work, people, and field mobility). The planned future state will:

- Enhance public safety and power quality by combining "big data" from meters and core network systems with existing network technologies to locate faults and automate controls to protect the public (augmenting tradition protections);

- Improved customer centricity and regulatory compliance, enabled by a single view of the customer, with new and enhanced customer communication channels and interactions;

- Information enablement and analytics, utilising enterprise foundational data to enable prudent decision making and efficient business processes;

- Security enablement protecting supply, customer data, processes and core network business systems to mitigate and manage risk, underpinning the security and reliability of the network;

- People Management competencies to ensure greater alignment of the workforce to customer and business outcomes;

- Field mobility to improve service performance, reliability and to extend asset management capabilities to the field.

6.5.   Plan Formation and Programme Definition

The gap between current and future state ICT defines project requirements for the period. The resources required for each project and their relative timing and dependencies are defined by applying the priorities of mitigations identified with the risk management framework.

AusNet Services policy for ICT assets is to ensure that they are always being supported by their vendors on standard terms. This applies to both infrastructure and applications and accounts for the majority of the lifecycle management initiatives for the period and the mitigation of the issues that result from changing versions of these technologies.

Discretionary projects are prioritised against their commercial impact and the capacity of the ICT organisation and its suppliers to deliver once risk mitigation projects have been planned.

6.6.   Assessment and Review

The final step in the formation of the ICT Strategy is peer assessment and review. The agreed program of work is circulated between key stakeholders in both ICT and business functions to ensure that the plan is fit for purpose, achievable and will realise key business and ICT outcomes.

This process is undertaken using a series of interviews, workshops and formal documentation reviews to formally verify acceptance, buy-in and agreement of the final plan.

6.7.   Costing Methodology

The ICT capex forecast was determined from a bottom up costing of individual projects. The cost of these projects were estimated using a detailed cost model developed by Ernst and Young (EY) which covers costs for Planning & Scoping, High Level Design, Detailed Design, Build, Test, Deploy and Support. These estimates were then tested by AusNet Services' subject matter experts who have experience in delivering projects and understand historical costs. This stage included obtaining supplier/vendor quotations to support the options analysis where feasible. For each initiative, security costs have been estimated by the AusNet Services Risk and Assurance (Security) team. These security costs were subsequently verified by Deloitte.

The ICT Capex forecast in this ICT Strategy is developed from P50 cost estimates (exclude contingency/risk factors) and are in direct terms (exclude corporate overheads and escalation).

7.   Forecast

AusNet Services is forecasting IT capex of $[C-I-C] ($real, 2014, direct) for the 2016-20 regulatory period. The overall ICT capital requirements for 2016-20 will [C-I-C]% lower compared to actual expenditure in the current period as AusNet Services has recently completed a number of significant IT investments and is approaching a point in its IT investment profile which requires less capital investment as explained in section 4.1 (Evolution of ICT at AusNet Services) above.

The annual forecast IT capex is set out in the figure below, alongside actual and expected IT capex from the current period.

The focus in the forecast period will be on delivering the remaining core elements of the enterprise strategy through seven inter-related programs. The figure below shows the annual actual/estimated and forecast ICT capex.

Figure 17 – Actual/Estimated and Forecast ICT Capex ($real 2014, direct)

[C-I-C]
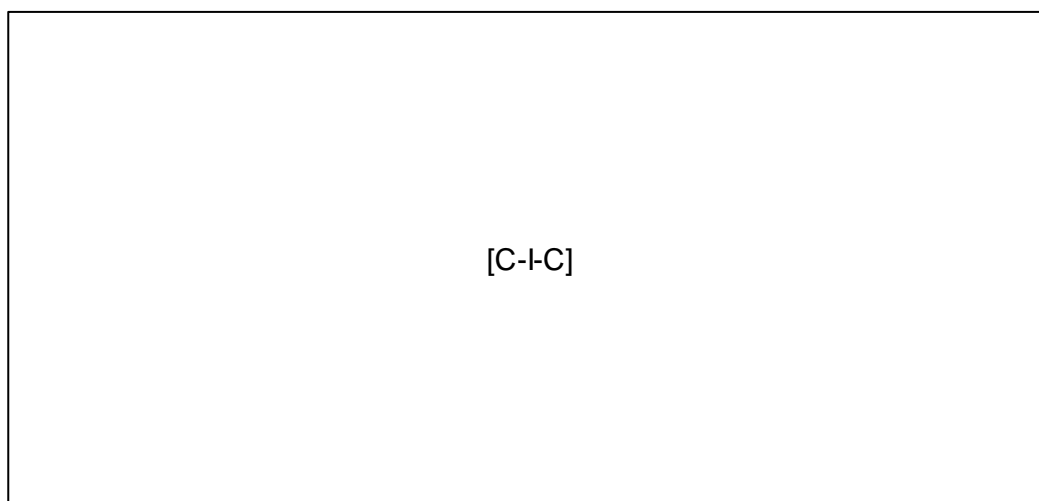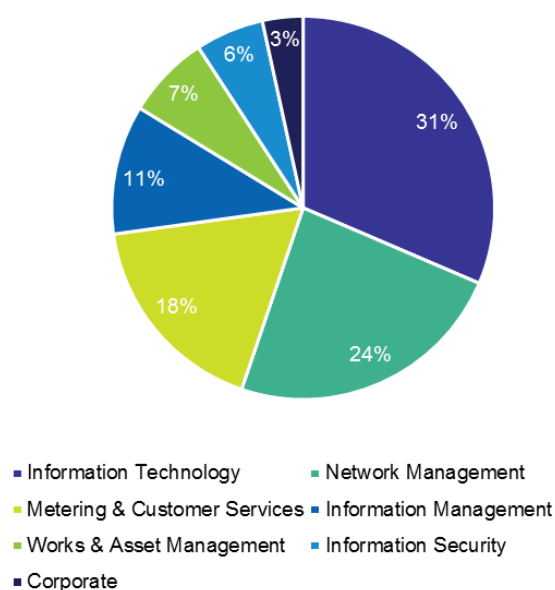
Figure 18 – Distribution of CAPEX by Program of Work for EDPR CY2016-CY2020

- Information Technology
- Network Management
- Metering & Customer Services
- Information Management
- Works & Asset Management
- Information Security
- Corporate

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The table below breaks these programs down into annual expenditure.

Table 19 – Annual ICT Forecast Capex (direct, $m real 2014)

Programs	CY2016	CY2017	CY2018	CY2019	CY2020	Total
Information Technology	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Network Management	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Metering & Customer Services	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Information Management	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Works & Asset Management	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Information Security	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Corporate	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
Grand Total	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]

During the CY2016-CY2020 period AusNet Services will leverage, extend and improve on the enterprise journey commenced in the previous period. The focus during the current period will be on delivering the remaining core elements of the enterprise strategy and realising the benefits of these investments. Further prudent investments will also be made in additional foundational capabilities and in extending and leveraging existing investments to support end-to-end network and asset management processes. This means that during the current period AusNet Services will have lower overall capital requirements, compared to the previous period, through a combination of cost saving and cost avoidance enabled by previous investments.

The below figure depicts how the ICT capability required to support the electricity distribution business will be developed incrementally over the CY2016-CY2020 period.

Figure 20 – ICT Business Capability Development Roadmap[13]

[C-I-C]
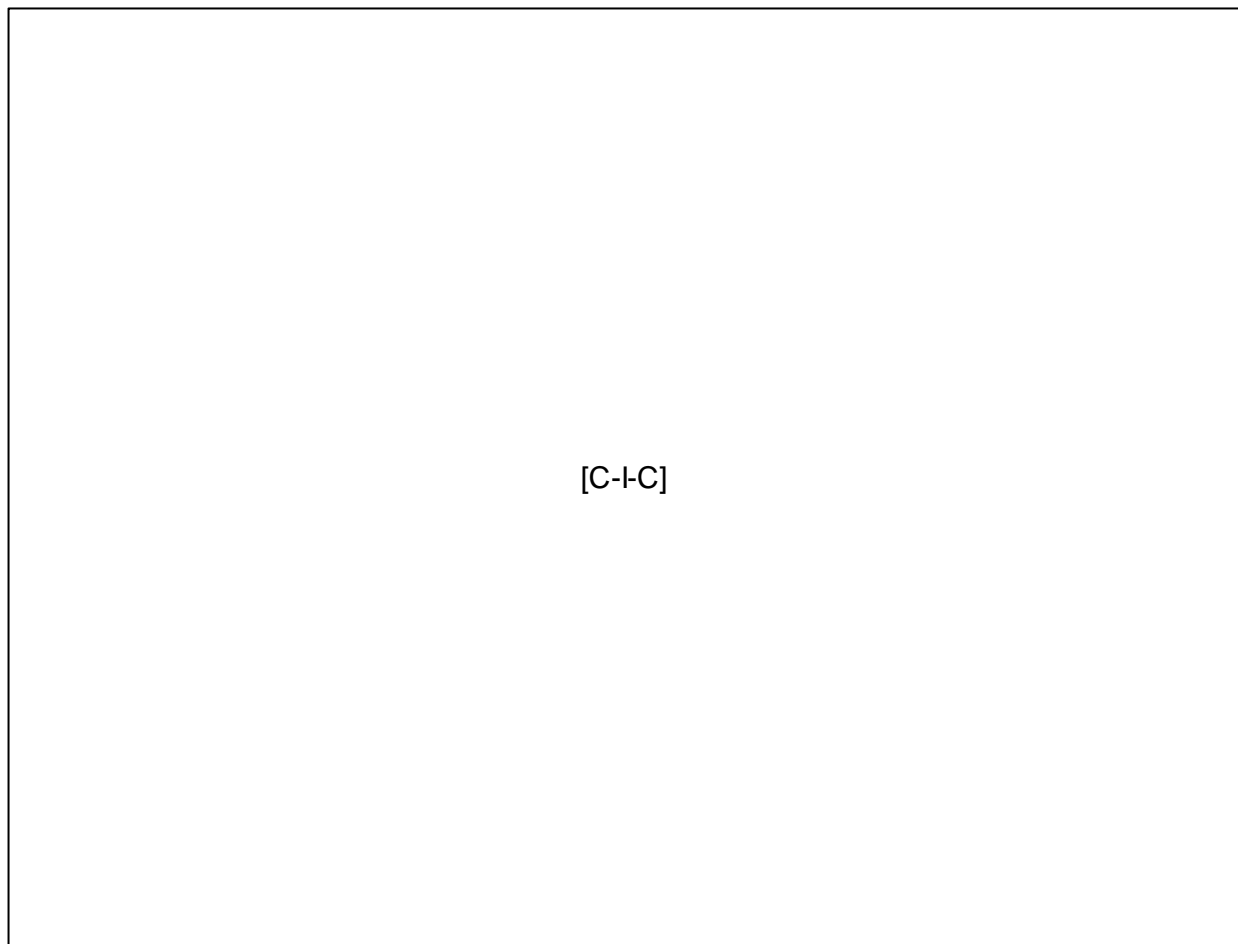
The ICT strategy for the current period is focused on reducing expenditure and enabling business capabilities at prudent cost. This will be achieved by transferring capital expenditure to operating expenditure.

- Capital spend, such as traditional expenditure on new hardware or software applications, will be transferred to operational expenditure through programs that aim to virtualise the ICT environment, move applications to cloud services and encourage workforce mobility and flexibility.

- Operational spend will also be reviewed by consolidating hardware and software applications and reducing end user interface complexity, resulting in fewer licensing fees and product roadmap spend requirements.

The CY2016-CY2020 ICT portfolio of work follows the natural enterprise expenditure curve that began with capital expenditure investments in the previous CY2011 - CY2015 period. This is characterised by the flattening trend expected through this period in the form of enhancements, enabling AusNet Services to finish the ICT enterprise strategic journey. The CY2016-CY2020 period will represent the descent in capital expense trend, reflected by forecast expenditure lower than the previous period.

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[13] AusNet Services. (2015). Appendix A. Technology Plan Summary. p. 10.

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The following seven focus areas represent the ICT investments and maintenance areas necessary over the next regulatory period to achieve AusNet Services' enterprise objectives.

- **Network Management** – This program of work aims to increase public safety and network reliability and performance by automating network monitoring and responses, where feasible, to create a self-healing network that reduces outage restoration time. This will be enabled through integration, automation and consolidation of key data sources and improved visualisation of near real time network performance.

- **Information Management** – This program of work aims to enable better decision making from better quality information and data analytics. The purpose of this program is to build data and analytics capabilities to improve the management of our networks and assets. The program addresses the most fundamental challenges, to provide the right information to the right person at the right time and the right place which enables prudent decision making and efficient business processes. A key objective is to establish a "single source of truth" for the organisation by ensuring a consistent view of all data. Effective and efficient analysis of reliably stored data will provide valuable information to improve network safety and asset management. Importantly the enterprise governance of data, processes and technology will also be augmented to ensure current and future requirements are met.

- **Metering and Customer Services** – This program of work aims to manage existing and anticipated regulatory changes and meet increasing customer demand in communication channel and information access. This will be enabled through prudent IT investments to align current landscape to regulatory changes, provide AusNet Services with a centralised system to store end customer information and expand customer engagement by increasing digital capabilities.

- **Works and Asset Management** – This program of work aims to increase network reliability to provide a quality service to customers and to improve operational efficiency to contain price growth. This will be enabled through building on the significant investment AusNet Services has made in the enterprise Assets and Work management solution (EAM/ERP) to empower enhanced functionalities by the rationalisation, consolidation and migration of additional key business processes.

- **Information Security** – This program of work builds on our security capabilities that are required to protect the Electricity distribution network, and customer and business information.

- **Corporate** – This program of work aims to support the achievement of the outcomes required in all other focus areas and to expand corporate capabilities to fully leverage the enterprise Assets and Work management solution (EAM/ERP). This will be enabled through providing a secure and consistent view of all data throughout the organisation that will augment analytics and reporting capabilities and implementing systems, processes and tools to support high performing leadership, capability and culture.

- **Information Technology** – The program of work aims to increase operational efficiency and manage ICT OPEX over future periods. This will be achieved through prudent investments to simplify the current ICT landscape and refreshes of key infrastructures including storage, enterprise servers, desktop and laptop fleets and corporate network and communications.

For further details on the proposed ICT program, please refer to **Appendix D – EDPR CY 2016 - CY 2020 – Detailed Program of Work.**

7.1. Operating Expenditure Requirements to Support CAPEX Proposals

It is expected that the forecast ICT capex will bring with it additional ICT opex requirements due to:

- Mandatory increases in costs caused by the support of regulatory changes and new business capabilities in:
    - network management;
    - field mobility for customer response and public safety;
    - metering and customer services;
    - information management;
    - information security; and
    - corporate and regulatory reporting;

- The ongoing transition to the new EAM/ERP enterprise platform (further rationalising of legacy business systems, including maintenance for interim read only system access);

- Additional operating expenditure to augment and reduce the reliance on traditional capital expenditure e.g. cloud infrastructure as a service (IaaS) and software as a service (SaaS) for data storage (big data):
    - Centralised employee management (SaaS);
    - Supplement on-premise storage with use of Cloud technologies to mitigate data growth / big data (IaaS).

However, as explained in Section 5 above which outlined AusNet Services' response to benchmarking results in ICT, AusNet Services is not including these step change costs in its forecasts (estimated to be approximately $[C-I-C] per year). AusNet Services expects to manage overall ICT operating expenditure such that these additional costs can be absorbed.

8.   Delivery

AusNet Services' three-stage delivery model will ensure cost-effectiveness at every stage of delivery to realise the benefits of the investments made in the previous period. The AusNet Services' delivery model is shown in the figure below.

Figure 21 – AusNet Services' ICT Delivery Model

The delivery ("system roll out") phase will not only be driven by strategic priorities, targeted objectives, the principles of prudency and allocative spend, but also by a stringent evaluation of cost versus price of proposed projects. All investments have been evaluated to ensure that the minimum cost has been obtained to achieve the targeted benefit for individual components, and that the lifetime cost of operation does not exceed the benefits that are to be realised.

Furthermore a detailed options analysis has been completed for each project within the CY2016-CY2020 planned program of work, a summary of which is outlined below for each key focus area. Evaluation of the 'Do Nothing Option' forms the baseline for decision making and has been evaluated to understand the risks and impacts associated with simply continuing with current AusNet Services' business as usual. Despite the option to Do Nothing it is expected that 'business as usual' operations and capital projects will continue. This continuation of business as usual will result in significant impacts to the business as detailed.

For further details on the proposed ICT program, please refer to **Appendix D – EDPR CY 2016 - CY 2020 – Detailed Program of Work.**

Electricity Distribution Network – ICT Strategy

9. Glossary

Term	Definition
ABC	**A**ctivity **B**ased **C**osts
AC	**A**ir-**C**onditioning Unit
ACS	**Alternative Control Services**
AD	**A**ctive **D**irectory
AEMO	**A**ustralian **E**nergy **M**arket **O**perator
AER	**A**ustralian **E**nergy **R**egulatory
AIS	**A**vailability **I**ncentive **S**cheme
AMI	**A**dvanced **M**etering **I**nfrastructure
AMP	**A**sset **M**anagement **P**lan
AMS	**A**sset **M**anagement **S**trategy
API	**A**pplication **P**rogramming **I**nterface
ATS	**A**utomatic **T**ransfer **S**witches
BAU	**B**usiness **A**s **U**sual
BI	**B**usiness **I**ntelligence
BYOD	**B**ring **Y**our **O**wn **D**evice
CAPEX	**C**apital **E**xpenditure
CBD	**C**entral **B**usiness **D**irectory
CIS	**C**ustomer **I**nformation **S**ystems
COTS	**C**ommercial **O**ff **T**he **S**helf
CPI	**C**onsumer **P**rice **I**ndex
CRACS	**C**omputer **R**oom **A**ir **C**onditioning
CURA	**CURA E**nterprise
CY 2011	**C**alendar **Y**ear **1 Jan 2011** to **31 Dec 2011**
CY 2015	**C**alendar **Y**ear **1 Jan 2015** to **31 Dec 2015**
CY 2016	**C**alendar **Y**ear **1 Jan 2016** to **31 Dec 2016**
CY 2020	**C**alendar **Y**ear **1 Jan 2020** to **31 Dec 2020**
DB	**D**atabase
DBMS	**D**atabase **M**anagement **S**ystem
DC	**D**irect **C**urrent
EA	**E**nterprise **A**rchitecture
EAI	**E**nterprise **A**pplication **I**ntegration
EAM	**E**nterprise **A**sset **M**anagement
ECM	**E**nterprise **Con**tent **M**anagement
EPM	**E**nterprise **P**roject **M**anagement
EB Services	**E**nterprise **B**usiness **Services** (Australia) Pty Ltd
EDMS	**E**lectronic **D**rawings **M**anagement **S**ystem
EDPR	**E**lectricity **D**istribution **P**rice **R**eview

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Term	Definition
EDW	**E**nterprise **D**ata **W**arehouse
EMS	**E**nergy **M**anagement **S**ystem
ERP	**E**nterpris**e R**esource **P**lanning
ESB	**E**nterprise **S**ervice **B**us
ETL	**E**xtract **T**ransform **L**oad
FAS	**F**abric **A**ttached **S**torage
FTE	**F**ull **T**ime **E**mployee
GAAR	**G**as **A**ccess **A**rrangement **R**eview
GIS	**G**eographical **I**nformation **S**ystem
GPS	**G**lobal **P**ositioning **S**ystem
GRC	**G**overnance, **R**isk and **C**ompliance
GST	**G**oods and **S**ervices **T**ax
HTTPS	**H**yper**t**ext **T**ransfer **P**rotocol **S**ecure
HR	**H**uman **R**esources
ICT	**I**nformation **C**ommunications **T**echnology
IDAM	**I**dentity **and A**ccess **M**anagement
IDS	**I**ntrusion **D**etection **S**ervice
IP	**I**nternet **P**rotocol
IPv6	**I**nternet **P**rotocol version **6**
IPS	**I**ntrusion **P**rotection **S**ystem
IT	**I**nformation **T**echnology
ITIL	**I**nformation **T**echnology **I**nfrastructure **L**ibrary
IT/OT	**I**nformation **T**echnology / **O**perational **T**echnology In the context of the electric power industry: • Information Technology (IT): traditionally associated with back-office information systems used for conducting business-type transactions, such as cost and tax accounting, billing and revenue collection, asset tracking and depreciation, human resource records and time-keeping, and customer records. • Operational Technology (OT): typically associated with field-based devices connected to the distribution system, and the infrastructure for monitoring and controlling those devices. This includes control centre based systems such as SCADA and DMS. Information Technology / Operational Technology (IT/OT) convergence: refers to the increasing integration of IT and OT. The application of smart grid technologies in the electrical distribution industry becomes more wide-spread and sophisticated, and IT is able to work together with OT applications to increase distribution system performance. For instance, IT/OT convergence is present when combining real-time and near-real-time data, system modelling, visualisation, simulation and integration to all major systems to provide a new platform for managing and operating electric distribution systems.
ITSM	**I**nformation **T**echnology **S**ervice **M**anagement
IVR	**I**nteractive **V**oice **R**esponse
JCAPS	**J**ava **C**omposite **A**pplication **P**latform **S**uite
LAN	**L**ocal **A**rea **N**etwork
LCD	**L**iquid **C**rystal **D**isplay

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Term	Definition
MDM	**M**eter **D**ata **M**anagement
MIC	**M**arket **I**mpact **C**omponent
MMS	**M**arket **M**anagement **S**ystem
NAS	**N**etwork **A**ttached **S**torage
NOS	**N**etwork **O**utage **S**chedule
NER	**N**ational **E**lectricity **R**ules
OMS	**O**utage **M**anagement **S**ystem
OPEX	**O**perational **E**xpenditure
O/S	**O**perating **S**ystem
OSS	**O**perational **S**upport **S**ystems
PABX	**P**rivate **A**utomatic **B**ranch **E**xchange
PDU	**P**ower **D**istribution **U**nit
PET	**P**roject **E**xecution **T**racking
POEL	**P**rivate **O**verhead **E**lectric **L**ine
POMS	**P**lant **O**utage **M**anagement
PRINCE	**P**rojects **IN** **C**ontrolled **E**nvironments
PSTN	**P**ublic **S**witched **T**elephone **N**etwork
QA	**Q**uality **A**ssurance
QC	**Q**uality **C**ontrol
Qtr	**Q**uarter
RTS	**R**eal **T**ime **S**ystems
RTU	**R**eal **T**erminal **U**nit
SAN	**S**torage **A**rea **N**etwork
SAAS	**S**oftware **A**s **A** **S**ervice
SCADA	**S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition
SCCM	**S**ystem **C**entre **C**onfiguration **M**anager
SCOM	**S**ystem **C**entre **O**perations **M**anager
SIP	**S**ession **I**nitiation **P**rotocol
SLA	**S**ervice **L**evel **A**greement
SMF	**S**ervice **M**anagement **F**ramework
SOA	**S**ervices **O**riented **A**rchitecture
SOCS/OSSCA	**S**ystem **O**verload **C**ontrol **S**cheme
SOE	**S**tandard **O**perating **E**nvironment
SPA	**SP** **A**usNet
SQL	**S**tructured **Q**uery **L**anguage
STEM	**S**trengthen, **T**ransform, **E**xtend **A**nd **M**odernise
STPIS	**S**ervice **T**arget **P**erformance **I**ncentive **S**chemes
2008 TRR	**T**ransmission **R**eset **R**eview 1 April 2008 to 31 March 2014

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Term	Definition
2013 TRR	Transmission Reset Review 1 April 2014 to 31 March 2017
TNSP	Transmission Network Service Provider
TOGAF	The Open Group Architecture Framework
TRR	Transmission Review Reset
UNIX	UNiplexed Information and Computing System
USB	Universal Serial Bus
UPS	Uninterruptible Power Supply
VAV	Variable Air Volume
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VRF	Virtual Routing & Forwarding
WAN	Wide Area Network
WLAN	Wireless Local Area Network

Appendix A: Methodologies and Processes

This document identifies the key processes and frameworks that underpin the development of the ICT Regulatory proposal. The document covers key processes including:

- Program Delivery Planning;
- Project Management Methodologies;
- Enterprise Project Management Office;
- Forecasting, Cost Allocation and Funding methodologies;
- Project Delivery;
- Operational Service Delivery;
- Cost Allocation;
- Risk Management
- ICT Function Operating Model.

These key areas collectively provide governance and management processes that underpin both the development of the regulatory proposal and the prudent operations of the ICT function.

Program Delivery Planning

In planning to deliver successful ICT programs, AusNet Services conducts analysis on key project considerations and methods to ensure the efficient, prudent and successful delivery of agreed programs of works.

Key areas that ICT has considered as part of this planning includes but is not limited to:

- Project Governance
- Project Independencies
- Availability of Resources
- Cost / Risk of Projects relative to Program
- Business Change Management

Project Governance is the assurance that an operational framework is in place to enable logical and robust processes to deliver successful project outcomes. This framework utilises repeatable tools and methods with the aim of ensuring projects are successfully delivered to time, cost and quality outcomes. Project governance relates to all stages of the lifecycle including; project planning, delivery management and operational service. Governance processes for these areas will be described further in the following sections.

Identifying and managing project dependencies are another important consideration in ensuring the successful outcomes of programs of work. As part of the EDPR submission process, individual projects were analysed to identify project interdependencies and ensure alignment across the program. Areas of dependency include process, data, infrastructure resource, and various internal and external drivers. Resource and Infrastructure availability are particularly important issues for consideration in both project delivery and business as usual planning activities. The focus of AusNet Services' ICT new operating model is to build engagement and enhance value through a lean, reliable and disciplined operation which leverages our partners where required.

Resource and infrastructure availability will be therefore sourced and managed through a mix of internal and external providers to ensure flexibility, scalability and prudency in our program. The

Project Delivery section following provides further information pertaining to the method of sourcing and managing resources.

The below diagram demonstrates the proposed breakdown of costs; internal labour, materials and contracts on an annual basis across the program.

Figure 22 – Proposed Yearly CAPEX by Cost Type

[C-I-C]
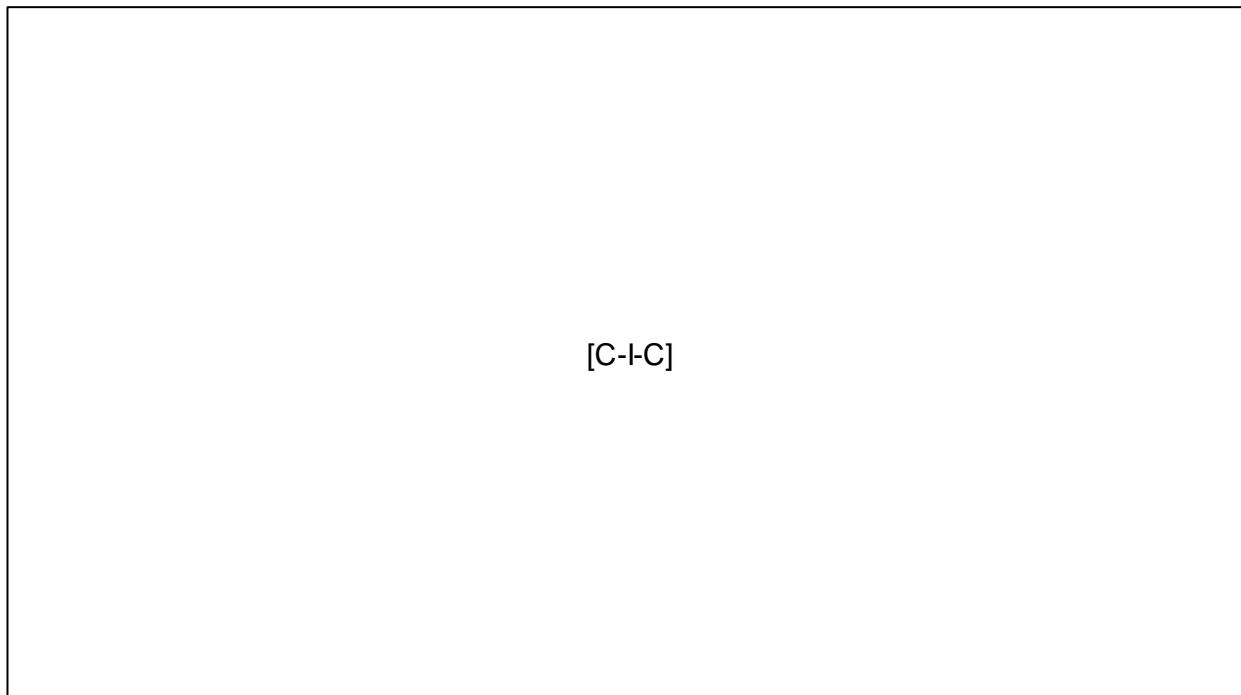
Another key planning consideration for establishing the ability to deliver a program is cost and timelines for individual project relative to the entire program. This method although being relatively rudimentary, is a standard method of analysing projects to ensure that programs do not derive risk by attempting to undertake too many concurrent projects and/or too many projects with high value or risk.

Based on previous experience of ICT project delivery and especially relative to spend in the previous period, the average planned annual spend of $[C-I-C] is a portfolio that AusNet Services feels very comfortable with being able to manage and successfully deliver business outcomes.

Figure 23 – Proposed Yearly CAPEX by Program of Work

[C-I-C]
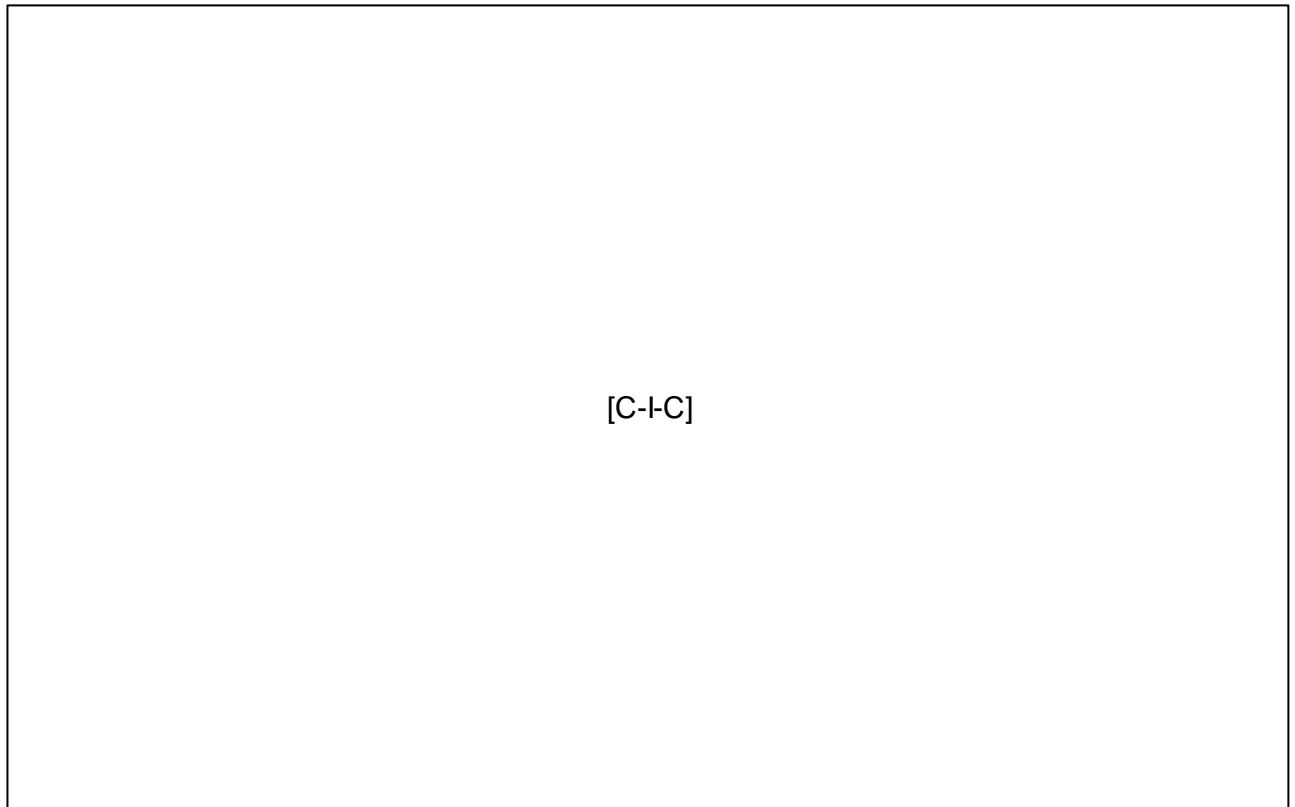
The final consideration in ICTs' program planning is the ability of the AusNet Services' business to not only accept the changes delivered by the ICT program but to be in a position to effectively embed enhanced processes and systems into the organisation to ultimately deliver desired business outcomes.

Readiness for change is continually assessed through a mixture of formal and informal stakeholder engagement channels that evaluate key change assessment areas:

- Readiness for change in process, people, system, culture;

- Complexity of impact to engagement, impact assessment and planning, capability development, change leadership and culture, organisation design and benefits realisation

- Availability of time and resources;

- Case for ongoing commitment to change.

Project Management Methodology

During the course of the previous period AusNet Services concentrated on reviewing and consolidating project management methodologies and processes through the formation of an enterprise wide Project Management Office (EPMO). This initiative recognises past challenges and seeks to employ more prudent governance in the future. All AusNet Services' capital projects follow a centralised Portfolio Framework which contains a simple four phased lifecycle approach and is governed by five gates, as per the figure below.

Figure 24 – AusNet Services Portfolio Framework
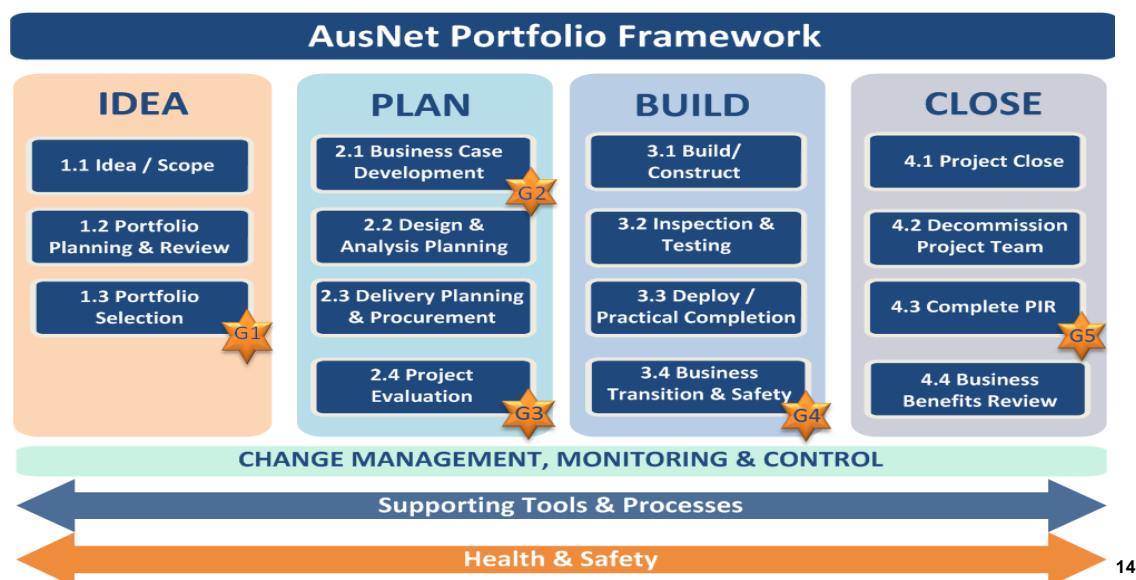
Enterprise Project Management Office (EPMO)

The EPMO governs and reports on projects through their lifecycle from idea through to completion stage, utilising industry standard project planning, justification, tracking, and reporting and governance tools. The purpose of the EPMO and its frameworks is to ensure optimisation and prudency of AusNet Services portfolio of projects; to improve overall coordination and delivery of benefits through enterprise oversight and tracking; and to ensure efficiency and reduction of costing through delivery management and effective selection processes.

The EPMO supports the delivery of AusNet Services' programs through the effective delivery of project planning by:

- Supporting the business functions using prioritisation to maximise the benefits of AusNet Services' investments; and

- Bringing together the business units in an aligned and structured way that delivers a singular AusNet Services' program of works.

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[14] AusNet Services, "How Projects are Managed" https://spausnet.sharepoint.com/sites/ePMO/How/SitePages/Home.aspx, (2015)

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Staged Funding of Major Projects

AusNet Services applies a staged funding approach to all major projects ([C-I-C]) and other projects as required. Staged Funding is a control process that requires a project to pass through approved gates prior to funding being released for the next stage in the project's lifecycle. At each gate, a review of the project is undertaken to re-assess how the project has performed up to that stage, both financially (year to date actual and forecast costs) and from a physical deliverables perspective. An assessment that the desired outcomes (and benefits) are still on track will also be made prior to allowing the project to proceed.

The entire project and its cost profile, which can extend over several years, are approved at the Business Case approval stage. The staged funding approach ensures that over the project's lifecycle, check points are established to evaluate progress against lifecycle expectations. A detailed review of actuals and forecast against the approved Business Case values enhances visibility, transparency and accountability. To measure and track staged funding, the Business Case must contain a split of the budget into each of the four key phases i.e. Idea, Plan, Build, Close as described above. These budgets are tracked by phase and cannot exceed agreed levels to ensure ability to deliver to plan.

Forecasting Methodology

In forecasting IT capex for the forthcoming regulatory control period, AusNet Services has:

- Assessed the current performance of IT systems and infrastructure to inform to what extent our existing IT systems and infrastructure can be utilised to support the AMS;

- Engaged business units to understand the AMS and jointly assess requirements of IT to support deliverability of these strategies;

- Considered alternate options where they are clearly identifiable;

- Considered emerging technologies and trends that can be applied, where it is effective and efficient to do so;

- Engaged experienced independent sources to provide research, benchmarks and/or cost estimates;

- Assessed the risk of preferred options, identifying appropriate mitigation strategies and the resulting residual risk;

- Completed cost and benefit assessment, incorporating all obtain inputs and key estimating assumptions. This includes the application of AusNet Services' IT cost allocation methodology, in recognition that AusNet Services is a multi-utility regulated business.

AusNet Services is confident that the forecast ICT capital expenditure is consistent with the CAPEX objectives and criteria set out in Rule 6A.6.7 of the NER.[15]

As part of effective capital optimisation across the business, AusNet Services conducts a capital allocation and prioritisation process that aims to prioritise the following year's capital expenditure to projects estimated to deliver the best value, aligned to our corporate and asset strategies. After projects are prioritised, full business cases are completed, that assess in greater detail areas such as; scope, methodology, costs, benefits, risk and timeline. The business owner of the project seeks required approval before project delivery is initiated.

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[15] Australian Energy Market Commission (AEMC), 1st March 2015, Section 6A.6.7 "**Forecast capital expenditure**". p. 845.

Project Delivery

During FY 2010/2011, a full and comprehensive review was undertaken to both understand the existing delivery framework and further refine the operating model for the delivery of projects and operational services with a view to establishing a more responsive and commercially attractive model.

The core components of this model include:

- AusNet Services' ownership of ICT project delivery;

- AusNet Services' ICT Portfolio Management function established with consistent reporting and governance across all work programs;

- Establishment of a System Integrator panel for ICT project delivery.

In FY 2012/13, a further review was undertaken to identify a competitive vendor selection process to establish a Tier 1 Systems Integrator panel and an alternative Tier 2 – Mid Tier or Niche product panel. The Tier 2 panel is designed to address the current gaps in niche technologies, local capabilities and provide AusNet Services with vendors more appropriate with the size of project engagement.

The selection process involved assessing vendors based on a variety of aptitudes including:

Table 25 – Vendor Panel Aptitude Qualities

Vendor Aptitude	
Capabilities Areas	Quality of Service Delivery Model
Industry Vertical Commitment	Local Delivery Strength
Customer References	Delivery Governance
Value Add Overview	Commercial Models

The outcome of this review process identified the Tier 1 and Tier 2 vendors displayed in the Project Delivery Model below. Panel members compete for major projects to ensure AusNet Services delivers the program of work at competitive rates. The following diagram summarises the project delivery model from business initiative, through project delivery, and transition to support:

Figure 26 – Project Delivery Model

[C-I-C]
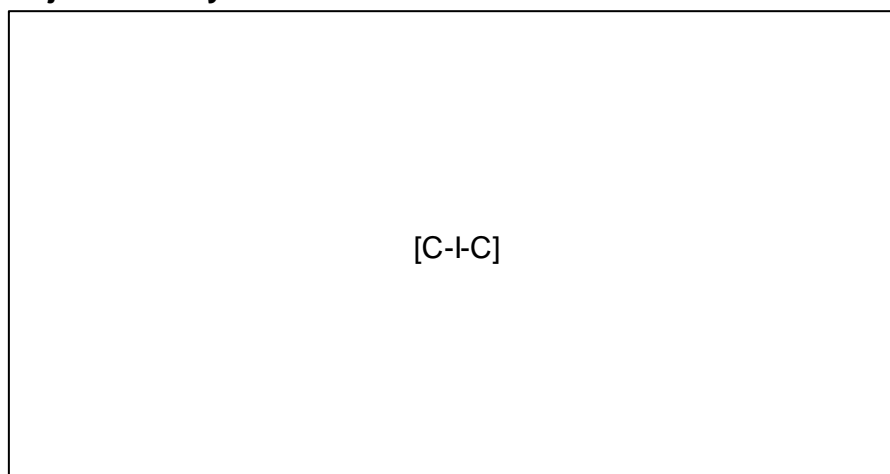
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AusNet Services has recently insourced the "Operate" function previously delivered by EB Services. This decision was in line with our goals to promote efficient investment and operations.

Cost Allocation Methodology

AusNet Services is a multi-utility regulated business (Electricity Transmission, Electricity Distribution and Gas Distribution). It is cost effective and efficient for AusNet Services to leverage ICT systems and resources across these utility businesses. Expenditures in these ICT systems and resources must be appropriately allocated to ensure regulated revenues reflect the true cost for each business.

The nature of a multi-utility regulated business is that some allocation of shared investments must occur. The value of the benefits available from this approach is demonstrated by:

- The hardware and software cost savings (economies of scale) which flow from this combined approach; and

- The efficiencies and synergy benefits from having a flexible workforce working across the different networks.

The allocation of IT capital expenditure is as follows:

Table 27 – ICT Expenditure Allocation[16]

Type	Electricity	Gas	Transmission	Total
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]

AusNet Services allocates its forecast ICT capital expenditure in the same way it has in the past to ensure consistency of forecast and outcome using Activity Based Costing (ABC). This is valuable in a regulatory context because it ensures that those projects, allowed for by the AER, are funded within the regulatory control period by electricity customers, will benefit from those expenditures in the following regulatory control periods.

AusNet Services undertook a review of the drivers of the costs (i.e. the origin of the benefits of the investments) to determine the appropriate allocation rules. AusNet Services ensures the consistency and the integrity of the ABC process by also conducting an annual external review of the survey data to ensure compliance to cost centre allocations.

The drivers are the broad areas under which the benefits of the projects are derived. Therefore, the expenditures incurred are allocated on the basis of broad allocation rules below.

AusNet Services uses several methods to ensure the appropriateness of the IT allocation rules.

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[16] Deloitte Touche Tohmatsu, "**Appendix D: IT Cost Allocation Methodology**", (2 April 2009), p. 3.

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Revenue: Those IT systems that are shared and relate to revenue should be allocated on the [C-I-C] basis between Transmission and Distribution. Within Distribution, the revenue cost relativities are between Electricity ([C-I-C]%) and Gas ([C-I-C]%).

Operating Costs: Those IT systems that are shared and relate to operating costs should be allocated on a [C-I-C] basis between Transmission ([C-I-C]%) and Distribution ([C-I-C]%). Within Distribution, the operating cost relativities are between Electricity ([C-I-C]%) and Gas ([C-I-C]%).

Effort: Those IT expenditures that are shared and will provide benefit, in terms of reduced effort or increased efficiency of work practices, should be allocated on a [C-I-C] basis between Transmission ([C-I-C]%) and Distribution ([C-I-C]%), and within Distribution between Gas ([C-I-C]%) and Electricity ([C-I-C]%) . This is borne out by the ABC surveys that have been undertaken. It is forecast that the level of works and effort will be similar in the future as they are today. This delivers confidence that the results of recent ABC surveys will be appropriate to allocate future IT expenditure where these projects provide direct benefit to the Electricity and Gas Distribution and Transmission customers.

Overheads: AusNet Services adopts one overhead that relate to internal AusNet Services IT staff. This includes related accommodation, utility costs and program management overheads. This overhead is calculated by determining the fully absorbed costs of AusNet Services' IT staff divided by the forecast capital expenditure of the given year. In the financial year starting 1st January 2014 (CY 2014), AusNet Services' forecast this overhead at [C-I-C]%. The forecast operating expenditure is net of this capitalised overhead and the forecast capital expenditure assumes that this overhead will remain constant at ([C-I-C]%).

Operational Service Delivery

The Service Management Framework (SMF) implemented by AusNet Services based upon the industry standard Information Technology Infrastructure Library (ITIL), underpins the delivery of IT Services. This framework is illustrated in the figure below:

Figure 28 – Service Management Framework

[C-I-C]
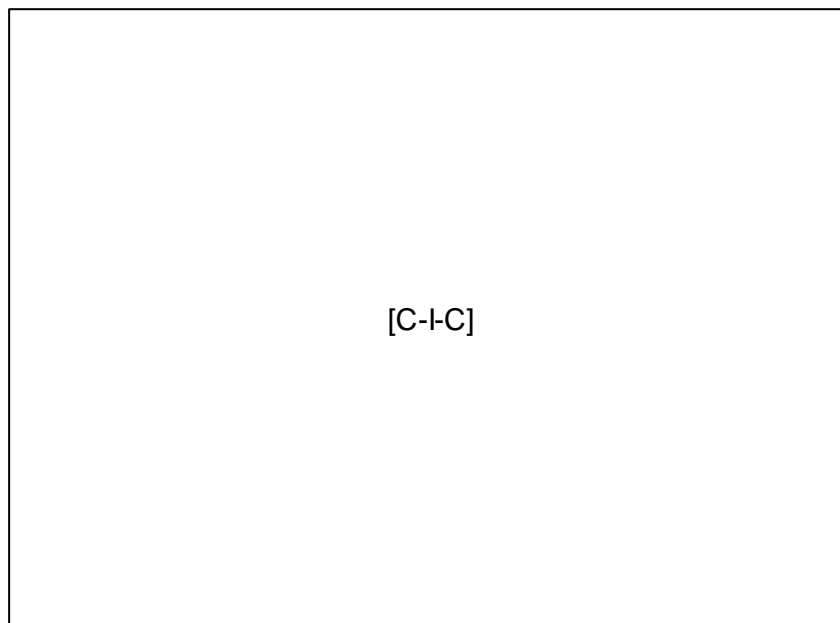
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The framework is specific to the needs of the AusNet Services business and provides a consistent set of processes and tools for managing the delivery of IT services. These have been developed in a manner that supports the AusNet Services business requirements.

The development, agreement and implementation of an SMF for the ongoing delivery of IT services enables and ensure a consistent set of processes, tools and measures which can be more easily monitored and managed for the delivery of IT services.

The benefits of the implemented SMF are:

- Reduced complexity in managing business requests through their lifecycle;

- Improved understanding by AusNet Services on the capability currently available to provide services;

- Defined Service Level agreements – reportable and measurable;

- Increased capability through standards, policies and processes;

- Consistency for AusNet Services' business users when creating requests for work to occur and understanding delivery timeframes;

- Improve operational effectiveness and enhance overall business performance;

- Enhanced ability to leverage cloud computing;

- Lower overall costs for IT Service Management by common, repeatable, audible processes to increase IT support effectiveness;

- Ability to deliver more proactive services;

- Improved reporting;

- Introduces consistent level of governances;

- Reduced delays; and

- Ensures Continual Service Improvement program initiatives are planned and implemented.

With the ITIL based service management framework in place for the management of ICT application and infrastructure, AusNet Services will be able to maintain operational service levels for increased volumes of business activity.
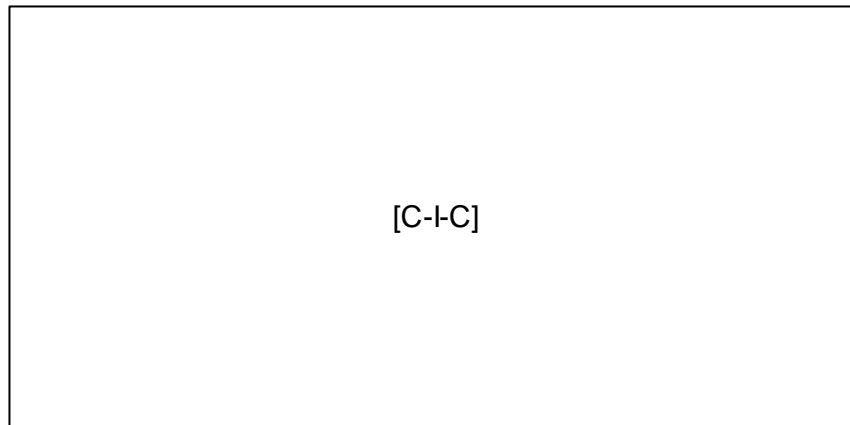
Risk Management

Risk Management is embedded within the culture of AusNet Services, with all employees responsible for the identification and management of risk. Risk Management underpins the Corporate Strategy enabling AusNet Services to identify and manage risk to ultimately achieve the corporate purpose of providing customers with superior network and energy solutions.

The AusNet Services' Risk Management Framework is based on AS/NZS 3100:2009 Standards and is documented in the AusNet Services' Risk Management Policy & Framework. The framework provides a structured and consistent process to the assessment and management of risk, enabling all business groups to make informed, risk based decisions.

The AusNet Services' Risk Management Process in accordance with AS/NZS 31000 standards is displayed in the figure below:

Figure 29 – Risk Management Framework

[C-I-C]

Risk Management Governance is captured within two main components, the first being assurances to the Board, and the second being the management of risk by business divisions.

The Board has ultimate responsibility for oversight for the management of risk, with an established Audit & Risk Management Committee (ARMC) with delegated responsibilities.

Risk is managed and reported to The Board at an Enterprise level by the Risk & Assurance Division, with each AusNet Services' Division responsible for the identification and management of risks within their respective divisions.

The Risk Management Governance model is shown in the figure below:

Figure 30 – Risk Management Governance Model

[C-I-C]
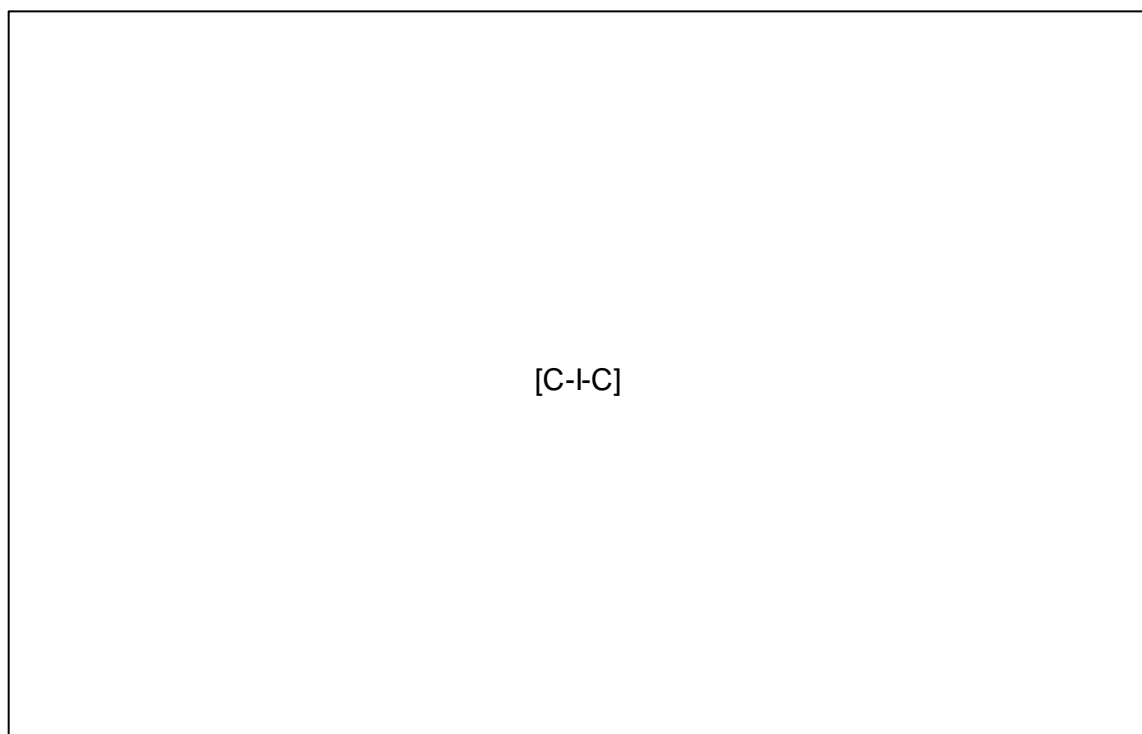
Electricity Distribution Network – ICT Strategy

Within AusNet Services' ICT, the management of risk is multi-layered. At a divisional level risks are managed and reported via the Corporate Risk Management System, CURA.

Within CURA, risks are categorised and reported as follows:

- Business Risk (risks which have a direct material impact on Business Plan Objectives);

- Emerging Risk (Uncertain change with unclear potential for impact and/or uncertain control capacity);

- Operations Risk (Direct impact on Divisional Plan Objectives, or potential to impact or potential to have an impact on Business Objectives.

At the divisional level, risks are managed and reported via an ICT Risks and Issues SharePoint register. The risks captured in SharePoint comprise ICT Operations (including Infrastructure, Hardware, Software), and ICT Business Systems (including Applications).

A Risk Review Forum is conducted fortnightly, where risks are reviewed and potentially escalated to 'emerging' risks in CURA. Risk is also captured, managed and reported for ICT Projects and specific SharePoint registers are utilised for Projects and Programs.

The ICT Risk Management Framework is shown in the figure below:

Figure 31 – ICT Risk Management Framework

[C-I-C]
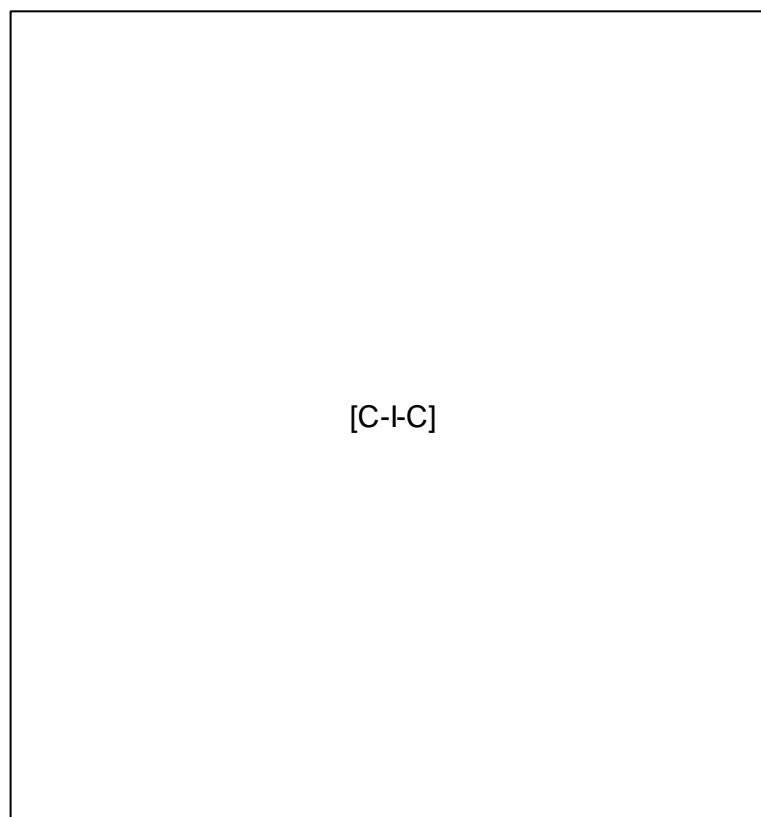
The AusNet Services' corporate and divisional risk management frameworks enable proactive management of key business risks to protect and provide acceptable returns on our investments and support the provision of high quality energy solutions.

Electricity Distribution Network – ICT Strategy

ICT Operating Model

In 2014 AusNet Services commenced the introduction of a new operating model to prepare ICT for the challenges identified and provide the foundation required to support the transition throughout the next period. The new ICT operating model will mature over time into a framework that supports an organisation built on an engagement of shared outcomes with the business, enhancing business value through a lean, reliable and disciplined operation which leverages its partners.

The ICT operating model is centred on the purpose – "*Through our people and partners we enable AusNet Services to deliver energy solutions to the market by providing dependable fit for purpose ICT services"* and comprises of 10 core functions:

- **People:** We lead and care for our people, continuously improving capabilities and performance ensuring our achievements are rewarded and celebrated.

- **Partners:** We leverage strategic partner capability to effectively deliver dependable, fit for purpose services.

- **Services:** We will align our services to the needs and expectations of the business, accountable in their delivery providing transparency of cost.

- **Engagement:** We are aligned to our business and work with them on shared outcomes driving value for the organisation.

- **Architecture:** We execute against our Business technology roadmaps aligned to the overall AusNet Services strategy.

- **Governance:** Through our actions and processes we will be disciplined in the way we deliver our services and solutions.

- **Idea:** We seek ways to use technology to improve business value and seek ways to do things better.

- **Plan:** We identify and analyse solution options ensuring sound investment decisions are made while working to an agreed timeline.

- **Build:** We will build technology solutions in a cost effective manner bring the right skills to be in the most efficient manner.

- **Operate:** We will run ICT like a business ensuring business needs and expectations are met.

The ICT Operating model aims to deliver the following key financial and non-financial benefits:

- Enable Cost Out through leveraging partners/vendors more effectively and governing contracts and sourcing across ICT;

- The right level of resource in the right functions with the right skills across the ICT organisation;

- Address existing gaps in capability, full time employee mix and spend compared to peers and industry standards;

- Support the transition of ICT's cost base to a competitive and sustainable level;

- Develop maturity to support industry and business drivers;

- Ensure that ICT is better aligned to the business and its ongoing requirements;

- Establish a more lean, reliable and disciplined operating model which enhances business value; and

- Ensures single point accountability for dependable fit for purpose ICT services and solutions.

Figure 32 – ICT Future Operating Model[17]
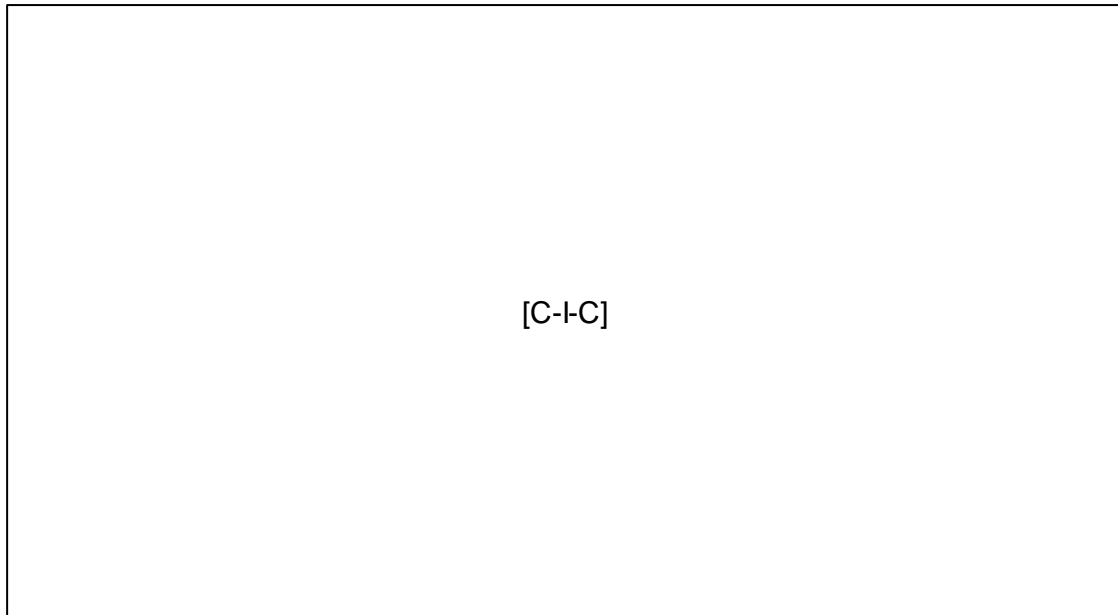
[C-I-C]

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Appendix B: Current Period Capex

Overview

In the CY 2011-15, the AER approved the following programs of work for the current Regulatory control period:

- Asset and Work Management;

- Network Management;

- Customer Care;

- Workforce Collaboration;

- Analytics and Reporting;

- Back Office Management;

- IT Infrastructure and Operations.

The AER set an allowance of $[C-I-C] for the period 1 January 2011 to 31 December 2015 including costs relating to the SCADA Master Station IT program. For the period CY 2011-15 total capex against this allowance is expected to be $[C-I-C]. This results in the total estimated spend at the end of the EDPR period being [C-I-C]% higher than the benchmark determination.

Table 33 – CY2011-CY2015 AER Determination vs Actual/Estimated Spend ($m, nominal)

	AER Determination	Actual / Estimate	Variance
IT Capex	$[C-I-C]	$[C-I-C]	$[C-I-C]

Note- The above figures are in nominal dollars and include corporate overheads.

The below table provides more detailed figures for each program on a direct cost (excluding corporate overheads) basis.

Electricity Distribution Network – ICT Strategy

Financial Performance

Table 34 – CY2011-CY2015 AER Determination vs Actual/Estimated Spend by Category (Direct, $real 2014)

	AER Determination	Actual / Estimated	Variance
Network Management	$[C-I-C]	$[C-I-C]	$[C-I-C]
Customer Care : Metering – Distribution		$[C-I-C]	$[C-I-C]
Customer Care	$[C-I-C]	$[C-I-C]	$[C-I-C]
Enterprise (Analytics and Reporting and Back Office)	$[C-I-C]	$[C-I-C]	$[C-I-C]
Asset and Works Management	$[C-I-C]	$[C-I-C]	$[C-I-C]
Workforce Collaboration	$[C-I-C]	$[C-I-C]	$[C-I-C]
IT Infrastructure and Operations	$[C-I-C]	$[C-I-C]	$[C-I-C]

Note: As actual program costs are only reported at the direct cost level, the above figures are direct costs and exclude overheads. To estimate the regulatory allowance in direct terms the overall allowance was reduced by an average overheads rate of 5.8% (the average rate over the current period).

The overspend occurred in three main initiatives: Network Management Automation (NMA), Advanced Metering Infrastructure (AMI) and Asset and Works Management (EAM/ERP).

Network Management Automation Program (NMA)

The benefits planned for the NMA program were to:

- Reduce safety hazards to the public during adverse weather (storm) events resulting from faster fault identification and isolation;

- Improve the quality of power supplies relating to voltage levels, phase unbalance (applicable to three phase loads) resulting from the future application of analytics (using increased network/asset visibility)

- Reduce public risks associated with distribution asset failures achieved through improved real-time asset condition knowledge arising from the integration of real-time operational and asset related information;

- Improve utility to customer interfacing during planned and unplanned network activity and resulting from improvements in auto voice messaging and more efficient manual action enabled by the DOMS information;

- Reduce carbon impact resulting from a lowering of the distribution network losses achieved through more efficient and integrated network voltage regulation;

- Increase the ability to lower bushfire risks through availability of automated control routines that facilities customised network configuration on days of high bushfire risk.

The original budget of the NMA program was an underestimate. Detailed analysis and requirements definition revealed that the interdependence of the systems and integrations required to fulfil the requirements and achieve benefits were considerably more complex than initially estimated. The project scope was therefore re-assessed and re-costed to deliver the actual functionality and

integration required to support the increasingly dynamic environment in which AusNet Services is required to provide manage distribution networks.

This analysis also compared the estimated costs with other Distributors [18] with similar customer profiles and functionality requirements and this exercise identified that the re-forecasted AusNet Services' costs to implement was relative to these other distributors.

Advance Metering Infrastructure Program (AMI)

The cost related to AMI program was higher than originally forecasted, therefore the portion attributable to the Electricity Distribution network, according to agreed cost allocation model[19], also contributed to the variance. This has been the subject of the AER's determination on AMI cost recovery and the allocation of these costs between the regulated distribution business and explicit pass throughs.

The underspend occurred for two main reasons

- Redeployment of resources to focus on key strategic programs;

- Conscious of prudent CAPEX and OPEX constraints, prudent risk management of asset management lifecycles to derive maximum benefits from existing assets.

The following sections provide more detailed analysis of the programs delivered, timelines for activities, costs incurred and outcomes and benefits achieved. Monies stated are represented in nominal dollars.

Asset and Works Management

During the CY2011- CY2015 period, asset replacement work was expected to significantly increase because a large proportion of network assets were nearing the end of useful life. If not managed effectively and efficiently, these deteriorating assets presented a commercial risk to AusNet Services and to the quality and reliability of supply. AusNet Services therefore needed to improve its integration and automation workflow capability to efficiently manage inspections, works- and asset management activities during the period.

The focus of the program was to centralise communication asset information and replace systems supporting asset and works management.

Three projects involved the continuation of the deployment of an Enterprise Asset Management (EAM) system to consolidate fragmented asset information into a single repository. They projects were strategically included in the scope of EAM/ERP solution as outlined in the previous section.

With resources invested in the implementation of the EAM/ERP solution, AusNet Services continued to support business-as-usual activities by delivering smaller projects to meet specific needs. Key objectives were successfully achieved beyond original plans, within budget, and as a result, critical operational requirements were fully delivered.

[18] AusNet Services, "**Network Management Automation Board Paper**", April 2010, p. 8.

[19] AusNet Services "SP AusNet – Cost Allocation Method", http://w w w .aer.gov.au/node/6504, 17 Dec 2010.

Table 35 – CY2011 - CY 2015 Actual ICT Asset and Works Management CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	$[C-I-C]

Figure 36 – Asset and Works Management Timeline of Implemented Projects

[C-I-C]
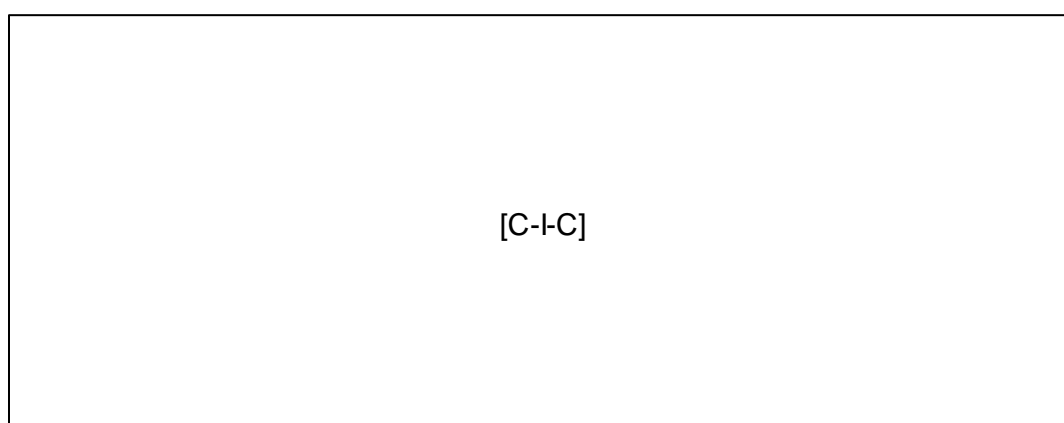
The outcomes of key projects implemented are:

- GIS Communication Assets:

  o Centralised all disseminated communication asset information and records, including significantly large volumes of metering information.

  o Enabled field staff to access reliable and complete asset information and geographic mapping, in a timely manner, improving network maintenance works.

- Enterprise Project Management Refresh:

  o Improved the visibility project/program pipeline and enhance data quality and integrity.

  o Transformed the project management framework, standardising, automating and consolidating processes, principles, templates and tools.

  o Migrated all ICT projects into the new platform to enable a smooth transition into the EAM/ERP solution.

  o Enabled AusNet Services to deliver programs of asset works with a holistic view of all aspects of program/project management consolidated in one enterprise platform, resulting in effective and efficient delivery of works.

AusNet Services invested in minor projects to support asset and works management activities and ensure network safety and resilience is maintained.

Overall, AusNet Services, modernised its ICT service offerings, exceeding original expectations in centralising asset data and consolidating systems, all of which enhance asset information quality, integrity and availability, reduces operational and safety risks with the aim to Improve the safe execution asset works.

Electricity Distribution Network – ICT Strategy

From a strategic perspective, paired with the successful implementation of the EAM/ERP solution, these Asset and Works Management projects provided AusNet Services with a complete, modern toolset to track, manage and better utilise assets and data, and ultimately, improve the effectiveness of capital investment in asset replacement and maintenance works.

Network Management

In alignment with its corporate strategy and fulfilling AusNet Services' regulatory obligation to provide safe, resilient and reliable network performance, AusNet Services implemented necessary tools to optimise and automate network management, and ensure network scalability, and ultimately continue to provide superior solutions to customers.

The aim of the Network Management program was to replace and fully integrate outage management systems with GIS and SCADA processes and systems, thus supporting real-time, remote management of the network.

AusNet Services successfully managed the high levels of complexity involved in this project, successfully achieving all project objectives and delivering an integration solution now in full operation. The cost of Network Management Automation (NMA) was initially underestimated for the requirements intended, however as the programme progressed, the project scope was widened to deliver a broader range of replacements, contributing to overspend. The re-scoped NMA spend aligned to standard benchmarks when comparing to industry peers.

Table 37 – CY2011 - CY 2015 Actual ICT Network Management CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	$[C-I-C]

Figure 38 – Network Management Timeline of Implemented Projects
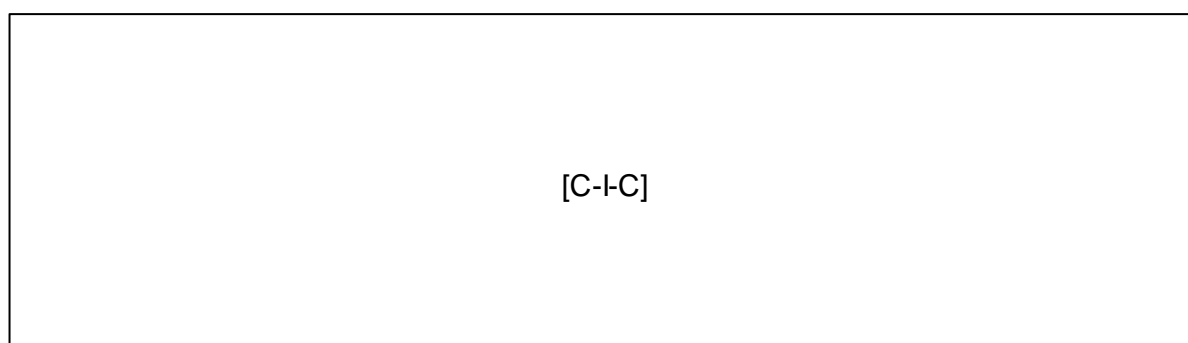
[C-I-C]

Electricity Distribution Network – ICT Strategy

The key outcomes of each of the three implemented projects are:

- Network Management Automation:

    o Implemented a new Distribution Outage Management System (DOMS), establishing real-time management and visualisation of the network at offices and depot locations;

    o Consolidated the electrical distribution GIS toolset and datasets;

    o Enabled AusNet Services to:

        ▪ Better manage network performance by responding to outages more efficiently, and improving prioritisation of customer faults and associated restoration (especially for critical customers);

        ▪ Schedule field crews more efficiently with planned and unplanned activities, and deliver more accurate and timely information to the field;

        ▪ Scale up in high-activity periods;

- SCADA Minor Enhancements, SCADA Refresh and SCADA Master IT:

    o Replaced end of life servers and desktop computers with new hardware platform;

    o Improved security framework for SCADA system;

    o Enabled AusNet Services to maintain the effectiveness of remote control and management capabilities.

The integrated GIS, DOMS and SCADA platforms provide an integrated network management solution to enable real-time, spatially aware, remote monitoring and management of the network, including management of outages, ultimately optimising network performance and improving the customer experience.

These enhancements have also laid a strong technology foundation for the utilisation of smart metering information and the facility to aid the transformation of data into useful and actionable information, supporting the modernisation of the network and the business as a whole.

Customer Care and Distribution Metering (AMI) Cost Allocations

The customer care program seeks to manage customer interactions with the intention to improve customer service and satisfaction. The program implemented during the period relative to the CY2011- CY2015 plan will be described in further detail in the customer care section following.

During this same period, costs were also incurred in the Advanced Meter Infrastructure (AMI) program. In alignment with the AER agreed AMI cost allocation model (Australian Energy Regulator, 2010) costs have been allocated to the Electricity Distribution business in alignment with the levels of benefits this same business would receive on completion of these CAPEX programs.

Electricity Distribution Network – ICT Strategy

A summary of the AMI IT CAPEX Cost allocation model is shown below:

Table 39 – AMI IT CAPEX Cost Allocation Model [20]

Project Type	Dist. Elec	Dist. Gas	Trans.	AMI	Total
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]
[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]	[C-I-C]

Due to the complexity of the AMI solution, these projects have had higher costs than were originally forecast and therefore contribute to a variance in the Customer Care function.

Table 40 – CY2011 - CY 2015 Actual ICT Electricity Distribution Metering CAPEX against Reg Allowance

	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]

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[20] Deloitte Touche Tohmatsu, "**Appendix D: IT Cost Allocation Methodology**", (2 April 2009), p. 3.

Electricity Distribution Network – ICT Strategy

Customer Care

At the beginning of the period, AusNet Services predicted a 20%-30% increase in customer interactions and recognised the importance in capturing customer information and more deeply understanding the continual impact of customer behaviour, attributes and trends. Moreover, heavy focus on customer service delivery was clearly and strategically communicated at the corporate level. As a result, AusNet Services started proactively and prudently investing in enhancements and, where feasible, automation of customer interactions.

As the first step toward a more mature, customer-centric capability, the focus of the customer care program during this period was to implement a replacement of the previous CIS system.

This solution will provide the, foundational repository for data relating to customer information.

As part of a long-term, transformation journey at AusNet Services, one of the major initiatives forecast in the current period is the implementation of a Customer Relationship Management platform. This implementation will uplift the capability delivered in the last period to provide enhanced customer interactions and improve customer relationship management. This will be fully implemented and integrated with the EAM/ERP solution, currently being delivered, and the Customer Information System during the CY2016-CY2020 period.

Table 41 – CY2011 - CY 2015 Actual ICT Customer Care CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	$[C-I-C]

Figure 42 – Customer Care Timeline of Implemented Projects

[C-I-C]
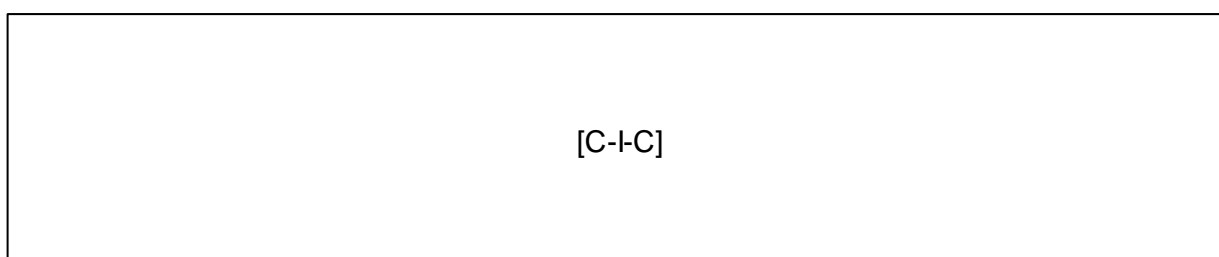
The key outcomes of the projects are:

- CIS:
    - Enabled monitoring of customer interaction history.
    - Provided improved channels for customers to automatically generate service requests, reduce call handling and receive SMS notifications.
    - Enabled AusNet Services to automate customer interactions and gather relevant information for improved, more tailored customer service and experience.
- Customer Self Service:
    - Enabled customer self-service functionality through a customer web portal.
    - Increased customer engagement around smart metering.

Electricity Distribution Network – ICT Strategy

The planned implementation of the CRM platform planned for this period was deferred to the CY2016-CY2020 regulatory period in order for the business to diligently assess how it will interface with the enterprise EAM/ERP solution currently being delivered. AusNet Services mitigated risks in deferring the CRM implementation by instead leveraging customer-centric capabilities enabled by the new CIS solution. The CRM will equip AusNet Services with a single view of integrated customer and asset information, enabling visibility of crucial customer requirements and optimisation of maintenance and delivery of asset works.

Overall, AusNet Services is progressing toward more mature, highly-developed capabilities to serve customers, supported by full visibility of customer interactions and needs. With a clear understanding of changing market expectations, communication channels are being enhanced, empowering customers with choices on how they interact with the business.

In the following regulatory period, AusNet Services will maintain the course of this transformation by fully integrating the CRM platform and continuing to augment self-service functionalities. In the long-term, AusNet Services will be able to better serve customer needs and expectations, in a more informative and efficient manner, thus improving quality of customer experience and satisfaction.

Workforce Collaboration

The volume of AusNet Services' structured and unstructured data is growing at a significant rate.

To improve performance and mitigate risks related to process inefficiencies, compliance and knowledge retention, AusNet Services aimed to provide remote, timely access to data, documents and records, and replace the systems supporting workforce collaboration and communication to provide smarter, more efficient methods to manage workforce and collaboration goals.

Planned Mobile computing and Enterprise Content Management solutions aimed to provide documentation and increase the capacity and capability to plan and communicate work plans to field workforce have been completed as part of the EAM/ERP solution and are outlined in section "Key Delivery Outcomes Section" - ICT Strategy.

These projects were included in the scope of the ERP program so therefore this accounts for the reduced spend in this functional area against planned spend.

The planned email solution was also successfully implemented albeit with a more prudent approach ensuring fit for purpose functionality utilising a cloud based solution.

Table 43 – CY2011 - CY 2015 Actual ICT Workforce Collaboration CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	$[C-I-C]

Figure 44 – Workforce Collaboration Timeline of Implemented Projects

[C-I-C]
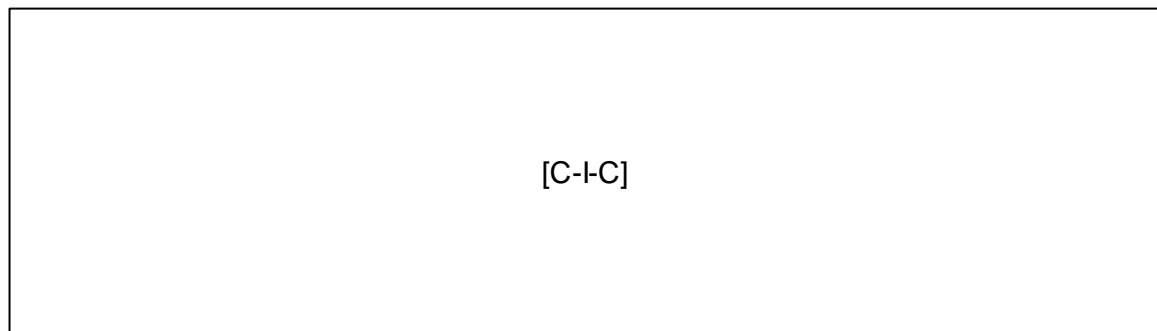
The key outcomes of each of the three implemented projects are:

- Enterprise Content Management:

    o Reduced spend due to lower re-assessed risks and strategic leveraging of existing toolsets;

    o Centralised repository of documents and information;

    o Improved accessibility and discovery, particularly for those on the field;

    o Enabled mitigation of loss of corporate knowledge and compliance with legal, regulatory and international standard requirements;

    o Enhanced functionality required to support asset and work management program further extended as part of EAM/ERP solution.

- Enterprise Email Platform Replacement:

    o Reduced IT complexity and dependency on certain skillsets to manage the email platform and associated costs;

    o Successfully migrating the existing server-based email platform to more cost-effective, cloud-based platform, treating all related spend as operating expenditure. This enabled AusNet Services to effectively improve the capability and capacity to manage e-mail communications, and simultaneously re-direct capital funding to more critical spending requirements such as NMA program.

- Multiple Mobile Computing projects:

    o Supported existing, under-developed workforce mobile solutions by implementing technical refreshes and enhancements, patching and maintenance services;

    o Contributed to continual and effective operation of the business required due to major mobile computing projects being included of scope of EAM/ERP implementation.

In future periods, AusNet Services will continue to prudently invest in addressing the challenges of information and knowledge management; empowering the workforce to make decisions based on quality information; and improving communication, collaboration and overall workforce and customer experience.

Electricity Distribution Network – ICT Strategy

Enterprise

IT systems and infrastructure supporting back office activities and analytics and reporting capabilities were nearing end of useful life. As part of the enterprise approach, AusNet Services identified the need and opportunity to replace and/or consolidate these enabling tools and platforms. This was particularly the case for analytics and reporting capabilities due to significant increases in asset replacement, maintenance and capital works, where higher data volumes were expected to impact the business' ability to derive actionable intelligence. AusNet Services understood the need to extend capacity and capability of analytics and reporting platforms, complemented with better data visualisation and integration, and more accurate, timely and relevant reporting generation for both internal and external stakeholders. The main variance in this area was predominantly due to the EAI project. Higher than anticipated investment was required due to the unforseen decision of Oracle to retire the existing platform.

Several projects were incorporated into the scope of EAM/ERP implementation, including the consolidation of HR and payroll systems, and implementation of advanced analytics capabilities and a reporting dashboard equipped with flexible data manipulation and discovery.

The focus of this program was to implement a centralised procurement management system, fully compatible for transition into the EAM/ERP solution and begin the information management journey by undertaking the rationalisation of platforms for integration, data storage and processing. During the investment period, AusNet Services prudently maintained existing platforms and applications to support operational activities.

Key objectives of implemented projects were successfully achieved, with the expected completion of projects integrating and supporting enterprise data storage. With regard to the latter, project scope was expanded to align with corporate strategies and industry trends, create long-term, sustainable efficiencies, and ensure compliance with changing governmental and regulatory requirements, thus resulting in spend beyond original plans. The data warehouse foundation will then be further augmented during the coming period, improving enterprise information management to enable decision making and more effective business processes.

Table 45 – CY2011 - CY 2015 Actual ICT Enterprise CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	$[C-I-C]

Figure 46 – Enterprise Timeline of Implemented Projects

[C-I-C]
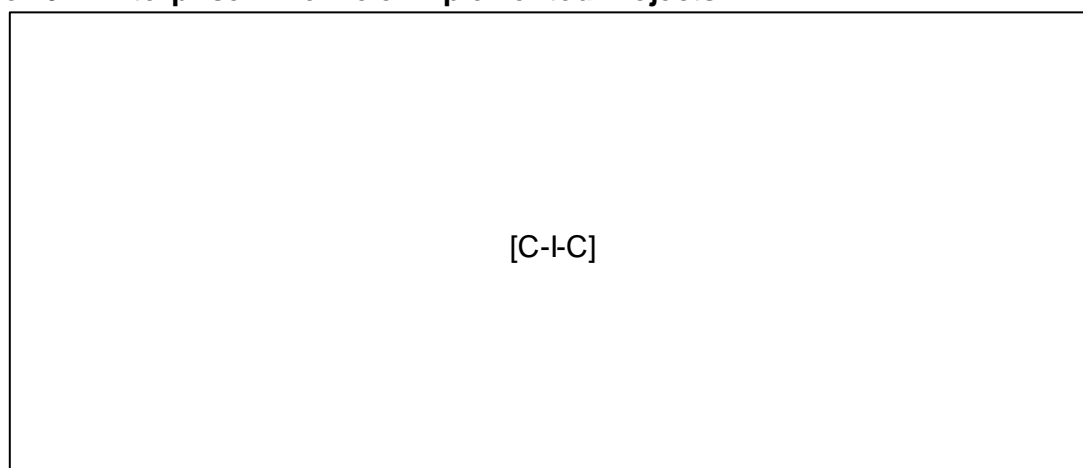
Electricity Distribution Network – ICT Strategy

The key outcomes of each of the two implemented projects are:

- Procurement, Contract and Supplier Management System:
  - o Although not proposed in the EDPR CY2011-CY2015, this project centralised the procurement function, streamlining end-to-end procurement, contract and supplier management processes and activities, and reducing risks in delivery of major network management projects.
  - o This enabled AusNet Services to centrally and efficiently manage and oversee capital spending and purchasing requirements.

- Minor Functional Extensions:
  - o AusNet Services took the initiative to implement multiple improvements such as software or service enhancements, and purchase of new licenses on an as-needed basis to meet business needs.

- EAI Replacement:
  - o Provided a new platform significantly more cost-effective and scalable for the long-term, and well-aligned with the ICT strategy and industry preference for commodity-based hardware and operating environments.
  - o Enabled the rationalisation of integration points into a single, agile and less complex platform, delivering future state requirements for integration along with cost-effective scalability roadmap.

- Enterprise Data Warehouse Upgrade and Licencing and Platform Extension (expected to be finished in 2015):
  - o Upgraded Extract, Transform and Load (ETL) tool to the latest version, improving data migration processes.
  - o Upgraded Business Intelligence (BI) Tool to the latest version, enabling a broader reach of analytics and reporting capabilities and closer integration data warehouses.
  - o Enabled AusNet Services to store and process significant volumes of data across the business for cross-functional analytics and reporting.

The implemented projects optimised enterprise capabilities including stronger financial and procurement capability, and analytics and reporting with consolidated, reliable commercial data. In addition, the projects resulted in the integration of multiple data points and storage of high volumes of data, improving organisational agility to leverage near real-time analytical data. AusNet Services is better equipped to streamline commercial activities, make more informed decisions and address specific organisational, regulatory and compliance reporting requirements in a more timely, reliable and flexible manner.

In the long-term, AusNet Services will have the capability to scale back office activities and leverage a broad range of analytics and reporting capabilities. This will enable the organisation to undertake a more proactive and strategic approach around asset management, network optimisation, customer service delivery and workforce performance management, improving operational efficiency and ultimately customer satisfaction.

IT Infrastructure and Operations

IT infrastructure assets were nearing the end of useful life, and if not managed effectively and efficiently, they would present critical risks to current business systems and on-going operations, and consequently affect the quality, reliability and security of supply of energy. With the purpose of ensuring that the IT infrastructure environment would provide reliable, safe and secure enablement of business and system processes, AusNet Services' strategically planned for and focused on the replacement of aging assets and extension of current capacity, as part of this program of works.

Two projects involving the refresh of Unix server hardware and implementation of associated management tools were strategically included in the scope of EAM/ERP solution as outlined in section "Key Delivery Outcomes Section - ICT Strategy".

Key objectives were successfully achieved, and in some cases, beyond original plans. Tactical steps and decisions to change approach to project delivery, such as increased virtualisation and choice of leasing options, led to sustainable efficiencies and cost avoidance, thus partially explaining the underspend of [C-I-C]%. Lower than expected total spend is also due to the choice of implementing parts of some projects through other program of works, such as Network Management and Customer Care, and extending the useful life of some assets (see section 4.1.1).

Table 47 – CY2011 - CY 2015 Actual ICT Infrastructure and Operations CAPEX against Reg Allowance

	AER Determination	Actual / Estimate	Variance
Capital Funds (Real 2014)	$[C-I-C]	$[C-I-C]	-$[C-I-C]

Figure 48 – IT Infrastructure and Operations Timeline of Implemented Projects

[C-I-C]
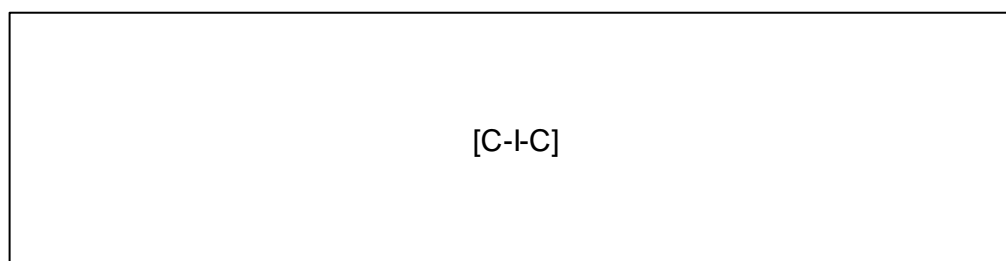
The key outcomes of the implemented projects are:

- WinTel infrastructure projects:
  - o Leveraged virtualisation technology, instead of replacing servers on a like-for-like basis, reducing maintenance costs without compromising server performance.
  - o Fully replaced desktop hardware, aligned to new SOE, with implemented operations and configuration manager applications.
  - o Leased printer infrastructure, instead of buying, thus deferring capital spend in a more strategic and cost-effective manner.
  - o Implemented integrated end-to-end suit of operations management tools for WinTel hardware, improving capabilities for incident and event monitoring and alerting, and performance management capacity planning.
  - o Created highly flexible, scalable platforms with the ability to create dedicated resources independent from physical infrastructure; and increased the capacity and

capability of IT infrastructure to meet agile service level requirements from the business.

- Data Centre Capacity Extension:
    - o Provided extra floor space at all data centres.
    - o Completed all remediation work related to electrical switchboards, mechanical structural strengthening air conditioning and ducting work.
    - o Enabled the extension of the operational life and growth capacity for the next few years, allowing existing facilities to continue to operate with minimal disruptions.

- Multiple initiatives, including lifecycle replacement programs:
    - o Provided secure wireless network connectivity within and between offices, a series of infrastructure management and monitoring tools management.
    - o Replaced other infrastructure assets nearing end of useful life, as part of multiple lifecycle replacement programs, such as the replacement of Real Time Systems hardware. This minimised the risk of hardware failure and improved efficiency, enabling increased support for agility requirements.

Remaining initiatives are in progress of being or will be completed in 2015 to support IT network and communications, security and storage.

Overall, AusNet Services transformed, rationalised and renewed the IT infrastructure, and established consistent control and management visibility over assets. It is therefore better equipped to support on-going business operations, mitigate operational risks and minimise the impact of hardware failure. As the business approaches the targeted future state, the IT infrastructure environment will become more robust, scalable and fit-for-purpose, fully protected against deliberate attacks and accidental errors, thus enabling AusNet Services to maintain quality, reliability and security of supply and ultimately, enhance customer experience and satisfaction.

Deferred Projects

During this period, AusNet Services managed its operational and capital spend to allow it to invest in highest priority initiatives. This resulted in projects that were not urgent to the business being deferred to:

- Allow for the delivery of critical, significant projects so key business and customer demands are addressed.

- Prudently wait until the EAM/ERP solution is fully implemented so deferred projects receive due diligence of full project scope, complexities and dependencies.

- Extend the useful life of some IT assets so asset value is fully maximised and capital spend is efficiently managed.

With a clear understanding of the importance of these deferred projects and the need to minimise risks, AusNet Services implemented multiple minor improvements to ensure operational continuity and support of systems. This enabled AusNet Services to ensure systems are stable and effective, and minimise issues related to performance, stability, support and data quality.

The EAM/ERP solution, once it is implemented, will deliver some of the outcomes planned for deferred projects, and therefore, will serve as a temporary solution for the business. For instance, the scope of EAM/ERP implementation includes corporate initiatives for standardised processes and data governance to ensure accuracy and reliability of data, and implements more advanced analytics capabilities that meet requirements similar to deferred initiatives from the Enterprise program of works.

Electricity Distribution Network – ICT Strategy

Current State

Throughout the course of the previous period AusNet Services recognised the increasingly critical and changing role of ICT in a rapidly evolving environment, characterised by volatile and falling aggregate demand, increased network complexity (e.g. distributed electricity generation) and increased customer expectations (from passive to active consumers). Specifically, the business was increasingly reliant on ICT to drive productivity; to help integrate the traditional silos of asset, network, field and customer; and to supply systems that were:

- Appropriately reliable and resilient (given their increased mission critical nature);

- Extensible and agile (able to respond and evolve over time, more quickly and at lower cost than legacy systems);

- Maintainable in an Opex and Capex constrained environment.

The current ICT environment is the result of a strategic response to support these outcomes effectively and cost-efficiently over time. Investment and effort has focussed on developing an enterprise foundation to leverage economies of scale across the three networks.

AusNet Services therefore prioritised the core asset & network systems with three foundational enterprise programs:

- Enterprise Relationship Management / Enterprise Asset Management (EAM/ERP) solution to provide a single source of truth for asset, work, people, supply chain and financial data, allowing for better management and maintenance of the RAB;

- Network management systems to improve network operations, reliability, service (including outage management and spatial systems);

- Advanced Metering Infrastructure to improve customer integration, interaction and communication.

All non-core and dependent investments were deferred to prioritise the enterprise foundation investments and minimise capital requirements during the period (e.g. enhanced Business Intelligence capabilities, drawing management and Customer Relationship Management). In addition, asset lifecycles were carefully reviewed and IT asset refreshes were delayed based on risk assessments and mitigations. Additional effort was aimed at reducing the number of obsolete systems and extracting cost efficiencies through consolidation.

The accrued effort and consolidation has left the current IT landscape with the following critical issues and challenges:

IT Challenges

- Fragmented data sets within multiple systems across the enterprise;

- Inability to leverage from data that exists in operational and external systems;

- Degrading mobile solutions in each business function;

- Duplicated warehouse platforms;

- Physical separation of the Energy Management System (transmission) and SCADA (distribution) control networks from other information networks;

- Siloed security architecture.

## Electricity Distribution Network – ICT Strategy

Business Implications

- Lack of confidence in the data used to conduct analysis and reporting;

- Business unit centric analytics and reporting;

- Reactive management of assets and the network;

- Unmanageable manual paperwork created in the field;

- Completion of administrative tasks (e.g. time sheeting) require field workers to return to the depot;

- More emphasis required on customer solutions;

- Tactical business line solutions;

- Internally focused enterprise services;

- Reactive security incident management;

- Little security threat intelligence.

Current Status of ICT Applications

The figures below summarise the current state of the Electricity Distribution IT systems and allocated assets.

Figure 49 – Current State Application Architecture[21]

[C-I-C]

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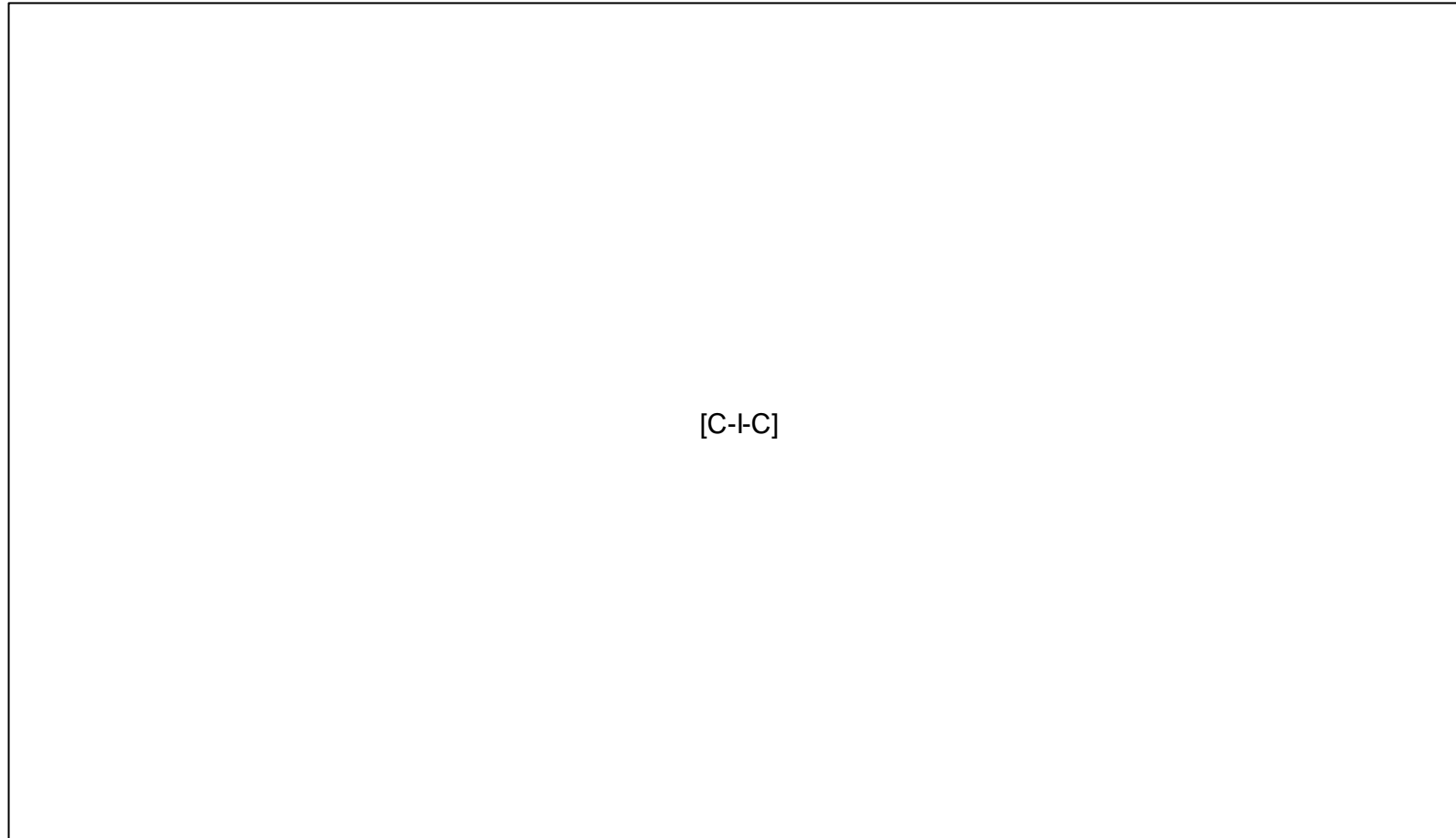
[21] AusNet Services, **ICT Technology Plan**, March 2015.

Appendix C: ICT Strategic Approach

ICT Strategic Approach

AusNet Services mission is to provide customers with superior network and energy solutions.

The organisation has committed to this mission by setting strategic objectives to achieve operational excellence and commercial agility whilst developing a better understanding of customer needs and future choices.

The ICT Strategy supports the achievement of these objectives by establishing and maintaining an ICT environment that efficiently and effectively enables and aligns with the AusNet Services Corporate Business Plan, strategic objectives and the Electricity Distribution network objectives.

Underpinning this, the ICT Division Business Plan addresses the challenges of the existing and future environments and enables ICT to deliver on its purpose: 'through our people and partners we enable AusNet Services to deliver energy solutions to the market by providing dependable fit for purpose ICT services'.

The figure below displays the interrelationship between the AusNet Services corporate strategic objectives, and the strategic approach of ICT to achieve this goal.

Figure 50 – ICT Strategy[22]

[C-I-C]

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[22] AusNet Services. (2015). Appendix A Technology Plan Summary. p. 2.

Electricity Distribution Network – ICT Strategy
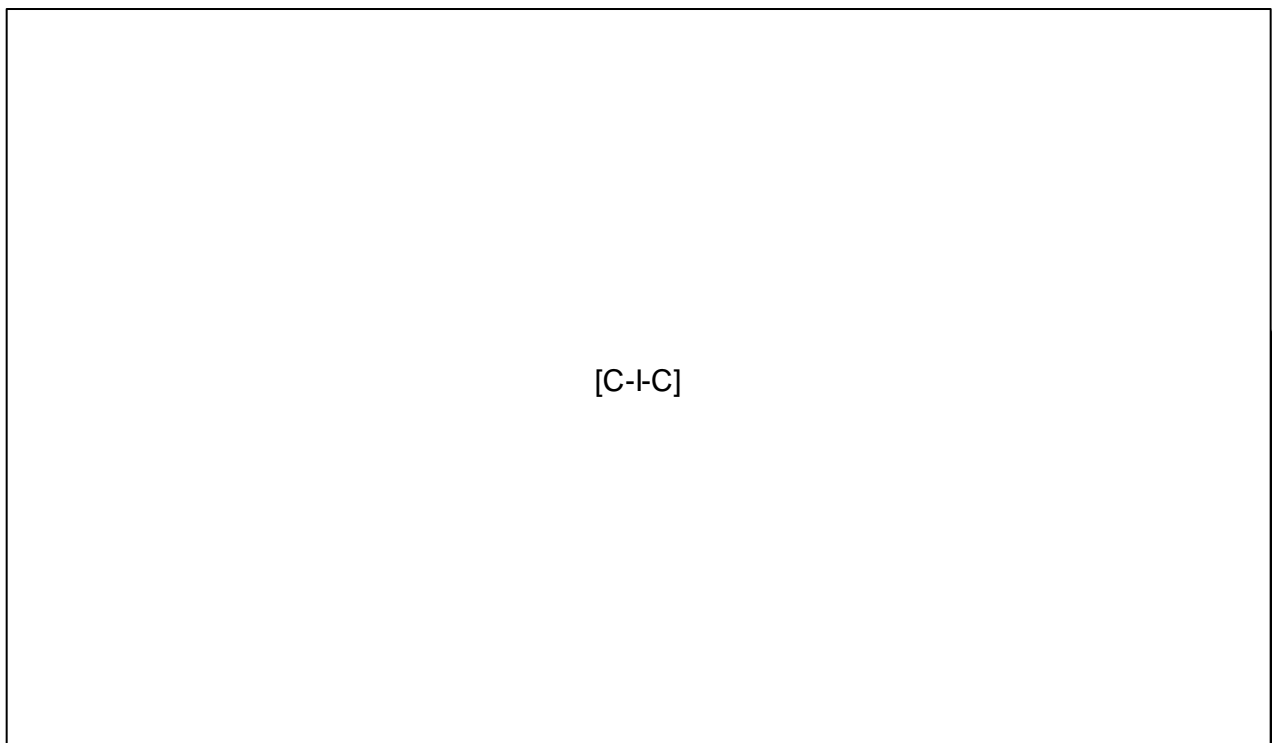
ICT Themes and Initiatives

The AusNet Services ICT Strategy is continually updated to reflect the combined impact and opportunities presented by emerging business and technology trends, progress of in-flight technology investments and changing expectations of the business, customers and other stakeholders.

The ICT Strategy[23] as supported by the ICT Technology Plan[24] identifies the following key themes for the CY2016-CY2020 period.

1. Leverage Core – simplify the ICT landscape by proactively decommissioning aged technology. This includes leveraging efficiencies and costs across the distribution (electricity and gas) and the transmission networks.
2. Information Enablement – build data and analytics capabilities enabling improved business-led and contextual decisions.
3. Communications Enablement – build communication capabilities that enable effective management of networks and assets.
4. Security Enablement – protect our customer and business information.

The following figures depict the four key themes and objectives of the AusNet Services ICT Technology Plan:

Figure 51 – ICT Technology Plan – Leverage Core [25]
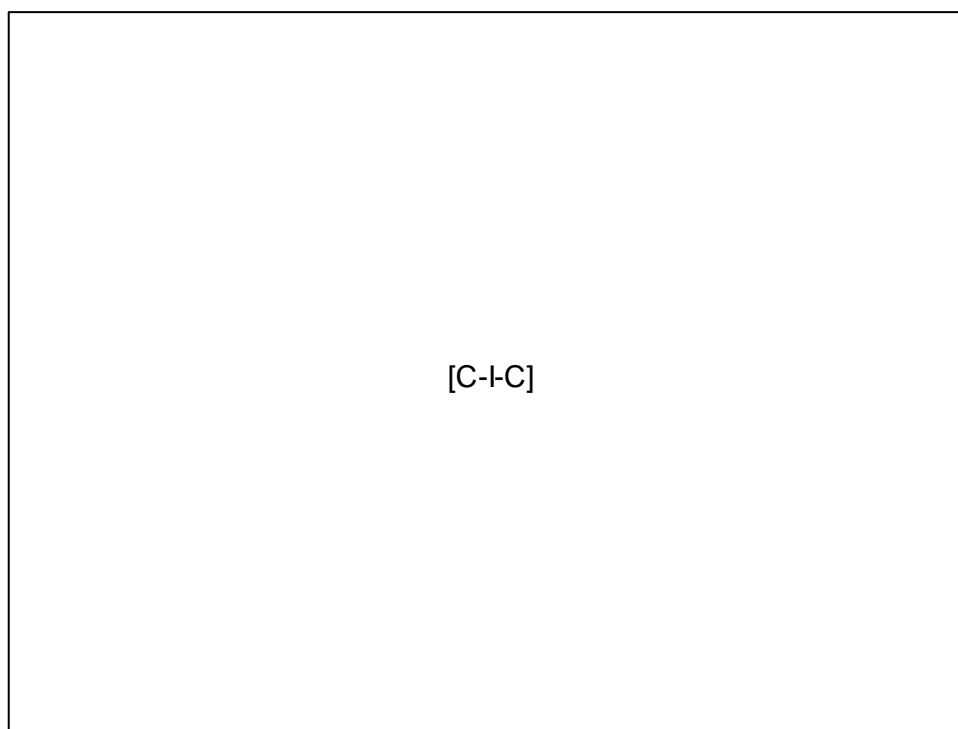
[C-I-C]

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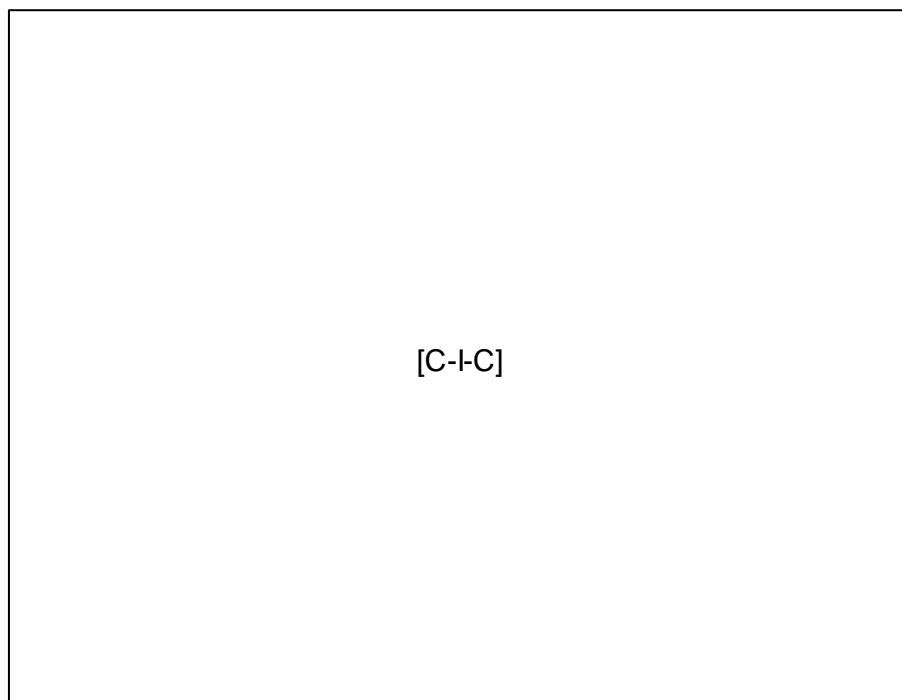
[23] AusNet Services. (March 2015). *ICT Technology Plan.*

[24] AusNet Services. (2015). *ICT Business and Technology Plan.*
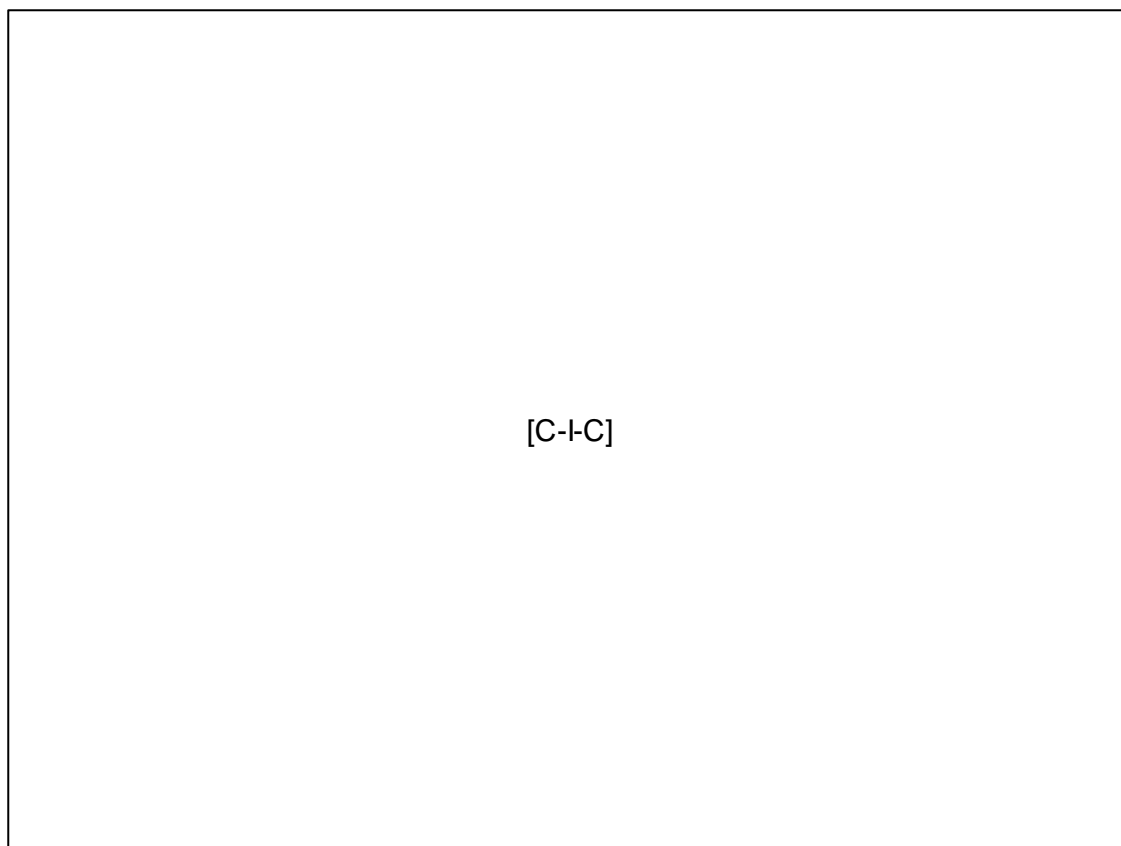
[25] AusNet Services. (March 2015). *ICT Technology Plan Executive Presentation Overview,* p. 13.

Figure 52 – ICT Technology Plan – Information Enablement[26]

[C-I-C]

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[26] AusNet Services. (March 2015). *ICT Technology Plan Executive Presentation Overview,* p. 15.

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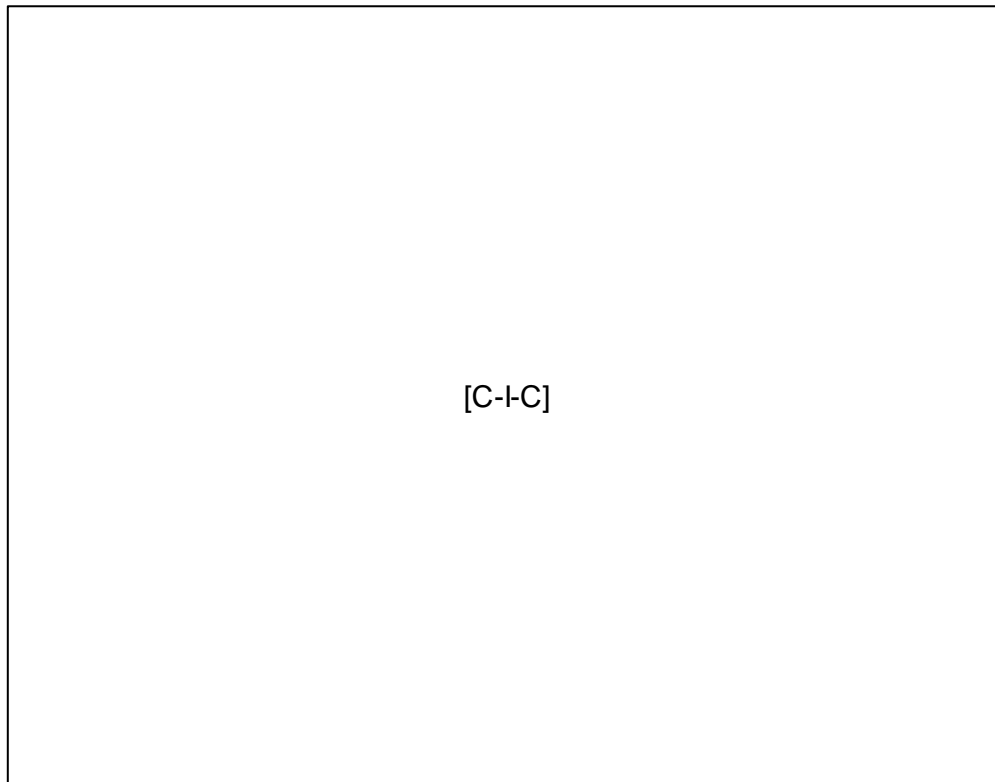**Figure 53 – ICT Technology Plan – Communications Enablement**[27]

[C-I-C]

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[27] AusNet Services. (March 2015). *ICT Technology Plan Executive Presentation Overview,* p. 17.

Figure 54 – ICT Technology Plan – Security Enablement [28]

[C-I-C]

Based on these themes, the planned IT investments for CY2016-CY2020 will enable business strategies and build on the foundational enterprise capabilities delivered in CY2011 – CY2015, focusing on customer service, customer safety, security of the distribution system and technology that supports the distribution network including assets, work, people and field mobility.

To support this programme of work efficiently and effectively, there will also be a refresh of ICT leadership, skills, capabilities, commercial relationships, delivery models and cost structures.

Specifically, in the CY2016-CY2020 period, ICT will:

1. Manage ICT as a Business: Implement an improved operating model that delivers reliable, quality outcomes and services through improved Governance, discipline, cost transparency, accountability, capability and performance.
2. Engage as a Trusted Advisor: Develop a technology roadmap which ensures all architecture and technology decisions are aligned to the business and expected outcomes.
3. Enable our Business: Deliver ICT information requirements and resulting programs enabling our business to meet market imperatives (i.e. EAM/ERP implementation & AMI Program). [29]

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[28] AusNet Services. (March 2015). *ICT Technology Plan Executive Presentation Overview,* p. 19.

[29] AusNet Services. (2015). *ICT Business and Technology Plan.* p. 3.

Electricity Distribution Network – ICT Strategy

The Strategic Objectives of the CY2016-CY2020 Capital Expenditure Program of work is to:

- Create a **safe, resilient and reliable network** by delivering the systems, tools and processes for data management and information security that support analysis and visualisation of near real time data for use in network and asset monitoring. Therefore increasing regulatory and customer expectations about the safety, security and reliability of the network and continuing to enhance its performance.

- Generate a **highly-developed customer service capability**, by providing a single view of customer information and digital customer engagement capabilities that enable personalised customer interactions. Therefore improving the overall customer experience, through faster, more accurate service and better access to information.

- Enable **business efficiency** supported by intelligent and automated processes and systems, by providing accurate data that supports strategic decision-making capabilities. Therefore improving operational performance while reducing costs by using technology as an enabler for the business and enhancing productivity of its workforce.

- Position AusNet Services as an **advocate for an enhanced regulatory framework** by supporting accurate compliance reporting through the consolidation and implementation of integrated compliance and risk management systems.

- Support AusNet Services in improving **safety and performance** by reducing operational risks though the implementation of a consolidated monitoring platform to manage workforce hazards and risks.

- Enable a **high performing leadership culture** by providing the ability to make strategic decisions based on accurate and meaningful data.

The CY2016- CY2020 ICT enterprise strategy will be guided by two key expenditure principles of *allocative spend* and *prudency*. The principle of *allocative spend* ensures that investments are allocated in the most efficient way to achieve the key ICT corporate strategic objectives and enable the highest benefits realisation potential. The principle of *prudency* guides the urgency of investments, and ensures that alternative options for proposed spend have been considered. AusNet Services defer investments where there is no immediate need and ensure solutions are fit for purpose and meet no greater than the minimum business requirement. These principles are based on understanding the key ICT objectives and needs of the business, and endorsing the most appropriate solution to enable those objectives.

Electricity Distribution Network – ICT Strategy

ICT Trends

The key ICT trends that impact or influence the utility industry are outlined below. These trends have in turn been considered within the context of the AusNet Services ICT program of work.

Table 55 – Key ICT Trends that have been considered to develop EDP*R* ICT program

Driver	Trends	Implications and Outcomes
IT/OT Convergence	• The trend of Information Technology and Operational Technology (IT/OT) convergence is accelerating with each release of new technologies on existing platforms, challenging conventional data and operational structures to meet increasing information requirements.[30] • IT/OT convergence will create additional infrastructure and security requirements as traditional, hard-wired systems give way to commercial, IP addressable systems that are more vulnerable to security threats. • By 2017, effective IT/OT integration will lead to increased revenue sources, revenue maximization or lower costs for the enterprise through better monitoring and control of physical assets linked to IT "applications"[31]	AusNet Services will: • Formally integrate and align governance models and establish data, process and system ownership. • Align IT/OT architecture and information security frameworks. • Integrate data flowing from IT and OT systems to ensure to support end-to-end processes. • Align and share infrastructure (data centres, telecommunication network, etc.), where appropriate and feasible. • Ensure ICT resources understand new IT/OT environments and operating models. This will enable AusNet Services to manage the increasing convergence of IT and OT, and associated data and information management needed for both IT/OT systems.
Information & IT Security	• Cyber-security is a serious and ongoing challenge for the energy sector, and cyber threats to energy delivery systems can impact national security, public safety, and the national economy. • In 2012, Industrial Control Systems Cyber Emergency Response Team (ICSCERT) reported that 41% of cyber security incidents across critical infrastructure sectors involved the energy sector, particularly electricity.[32] • As IT/OT increasingly converge,	AusNet Services will build on security capabilities to protect the Electricity Distribution network, customer and business information. This will enable AusNet Services to facilitate smart features of the network to be developed while maintaining its security.

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[30] Gartner. (Sept, 2011). *A Guide to Adopting IT Tools for Smart Grid OT Management Challenges.*

[31] Ernst & Young. (Feb 2014). *ICT Solution Strategy, Architecture and Roadmap.*

[32] Industrial Control Systems Cyber Emergency Response Team. (Oct - Dec 2012). *ICS-CERT Monitor.* USA: Industrial Control Systems Cyber Emergency Response Team.

Electricity Distribution Network – ICT Strategy

Driver	Trends	Implications and Outcomes
	vulnerability to cyber security threats increase. This is because, unlike IT systems, OT systems have little security capabilities and with no regular and automatic updates for service packs, new releases and bug fixes – they usually run the same software as the one initially installed. • Businesses need to make OT systems more secure before merging with IT systems, or at least ensure there is a good visibility of cyber threats, and integrate security practices across IT/OT.	
Smart Technology, New Platforms and Big Data[33]	• The continuous growth of OT deployment is increasingly modernising the network through smarter technology, which enhances monitoring and control of supply, and enables more innovative energy storage. • As smarter devices and equipment are deployed, there is increasing integration with previously isolated IT platforms for more cost-effective and reliable operation of the network. • As a result, there is an increasing and more frequent flow of large volumes of data. For instance, many businesses will go from one meter reading a month to smart meter readings every 30 minutes, resulting in millions of reads per day.	AusNet Services will harness, rationalise and normalise Electricity Distribution operational data for use by stakeholders in a near real-time environment to continuously improve network management capabilities and asset performance. This may be done by: • Integrating and consolidating multiple datasets, such as spatial data with customer data, to provide rich information for analysis and visualisation, as well as augmentation of existing analytic capabilities with advanced analytics platforms and toolsets. • Extending data quality practices across the entire organisation to improve completeness, currency and consistency. This will enable AusNet Services to leverage and exploit data as an invaluable asset, and make informed and meaningful decisions, thus transforming data into actionable insights.
Cloud Computing and Server Virtualisation	• Cloud services are rapidly approaching maturity and are expected to become the default model of procuring and running ICT services for many organisations. • Cognisant of providing cost-effective services whilst maintaining a safe,	AusNet Services will mitigate data capacity growth requirements by tactically migrating data into cloud solutions. This will enable AusNet Services to: • Benefit from an on-demand self-

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[33] Gartner. (2012). *Top 10 Strategic Technology Trends for 2012.*

Electricity Distribution Network – ICT Strategy

Driver	Trends	Implications and Outcomes
	secure and reliable Electricity Distribution network, AusNet Services will seek to harness cloud services where it is prudent and secure to proceed.	service, where the business is able to unilaterally provision computing capabilities as needed automatically, without contacting service providers. • Scale rapidly up and down as needed, and therefore pay for what the business uses. • Provide access to storage solutions via the network through desktop and mobile devices (e.g. workstations, tablets, laptops), therefore supporting on- and off-desk work. This could be integrated with existing intelligent, automated processes and systems, such as the EAM/ERP solution, thus providing additional support to end-to-end processes, which may not be available through on premises solutions. • Simplify the IT environment and associated management, and optimise cost through multi-tenancy of servers using virtualisation.

Future State

Within AusNet Services the role of the ICT business unit is to support the broader business by efficiently delivering cost effective technology solutions that enable achievement of the CY2016-CY2010 objectives; to leverage, extend and improve the enterprise foundation to realise benefits.

In the coming period, the key focus will be to:

- Leverage the foundation elements of the enterprise strategy;

- Extend enterprise solutions across end-to-end processes; and

- Improve enterprise capabilities in line with prudent investment decisions.

This will allow ICT to:

- Reduce capital expenditure, and control operating expenditure;

- Deliver business outcomes for customers and realise the benefits of the foundational enterprise investments; and

- Optimise the IT operating model and sourcing strategies, developing capabilities and enhancing maturity as a business enabler.

Electricity Distribution Network – ICT Strategy

The planned ICT investments enable business strategies and will therefore build on the foundational enterprise capabilities delivered in CY 2011 - CY 2015, focusing on customer service, customer safety, security of the distribution system, and technology that support the Electricity Distribution Network (assets, work, people, and field mobility). The planned future state will:

- Enhance public safety and power quality by combining "big data" from meters and core network systems with existing network technologies to locate faults and automate controls to protect the public (augmenting tradition protections);

- Improved customer centricity and regulatory compliance, enabled by a single view of the customer, with new and enhanced customer communication channels and interactions;

- Information enablement and analytics, utilising enterprise foundational data to enable prudent decision making and efficient business processes;

- Security enablement protecting supply, customer data, processes and core network business systems to mitigate and manage risk, underpinning the security and reliability of the network;

- People Management competences to ensure greater alignment of the workforce to customer and business outcomes;

- Field mobility to improve service performance, reliability and to extend asset management capabilities to the field.

The following figures depict the key changes to the ICT capability landscape and the roadmap required to deliver. The method is driven by AusNet Services' strategic approach to build on the foundational enterprise capabilities, establish single sources of truth, provide enhanced analytics and reporting, and deliver mobility services. The focus is on strategic platforms that support a wider range of business activities.

Figure 56 – AusNet Services' Technology Road Map – Business Capability[34]

[C-I-C]

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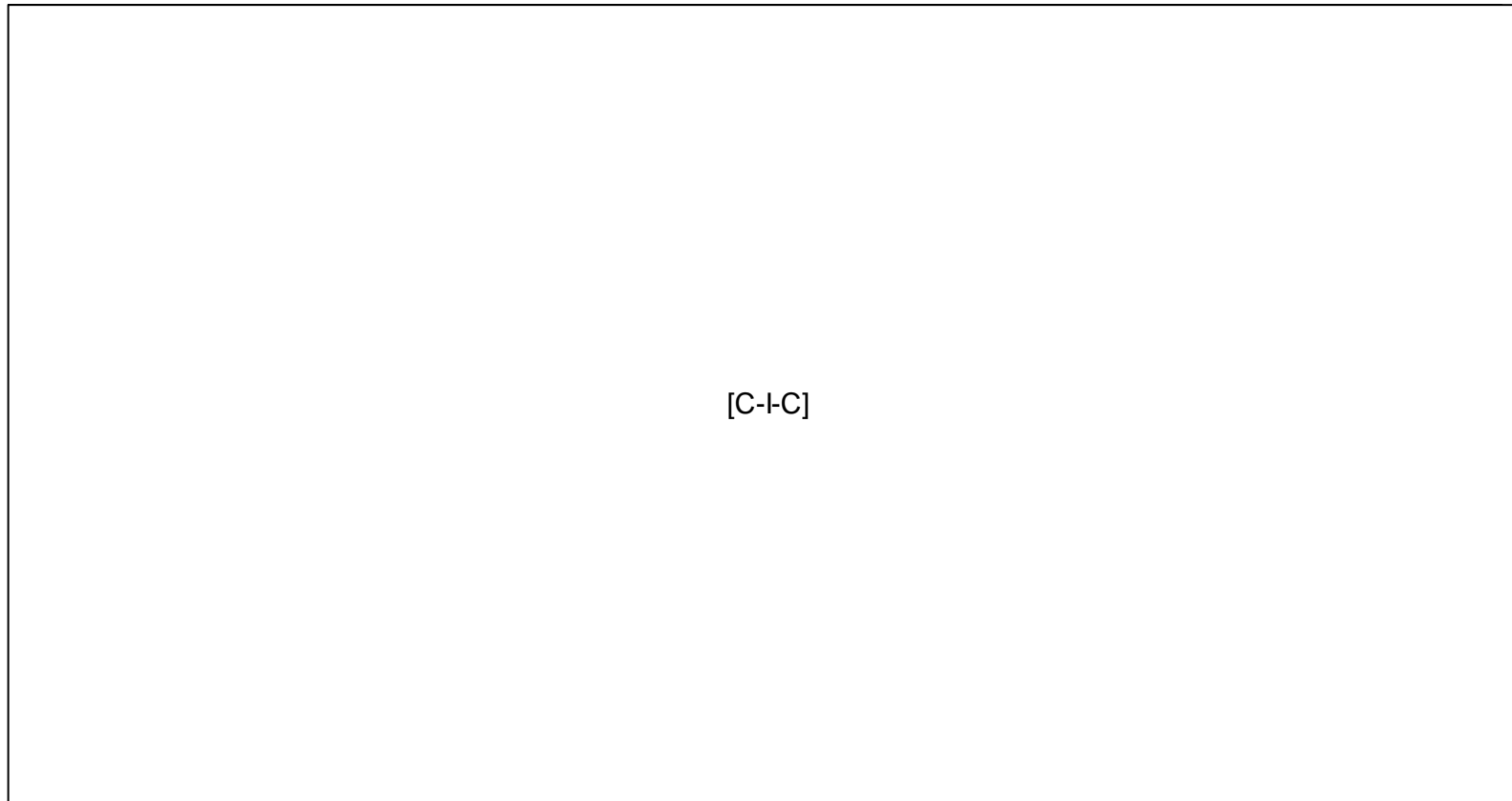
[34] AusNet Services. (March 2015). *ICT Technology Plan Executie Presentation Overview.* p. 7.

Appendix D: Capital Requirements CY 2016 – CY 2020 – Detailed Program of Work

Network Management

Business Reason

The priority of the ICT Network Management program of work is to build on its smart grid technologies and previous investments in outage management and network automation to optimise network efficiencies and operational effectiveness to support the reliability, safety and security of the supply and distribution systems. This is also in alignment with AusNet Services' Customer Engagement research that indicates that, "*there is an expectation that AusNet Services act proactively when planning network infrastructure requirements, rather than reactively, and act with high levels of speed and responsiveness when issues emerge*". (Colmar Brunton Research, Jan 2015)

The continuing deployment of smart grid technologies creates extensive data sets that contain significant and valuable operational insights to the whole of network condition.

Over the next period, effort will be directed towards harnessing, rationalising and normalising Electricity Distribution operational data for use by stakeholders in a near real-time environment to continuously improve network management capabilities and asset performance.

Increased reliability expectations with the need to minimise outages and reduce outage restoration time place additional pressure on existing work practices. Over the next period prudent investments will be made to continue building on the foundation previously delivered around the outage management system. This will be performed by delivering the require systems, tools and processes to support decision making and accurate outage detection in near real time to ensure public safety and network security.

Scope

The scope of programs and respective projects are described below.

Low Voltage Network Management and Integration of Distributed Energy Resources (DER)

The objective of this program is to improve power quality management and enable regulatory code compliance. This will be achieved by implementing network voltage regulation schemes and integration of Distributed Energy Resources (DER) technologies.

Progressive introduction of new DER technology within AusNet Services is re-shaping asset management and network operational requirements, especially within the LV networks where most of the disruption is occurring. New capabilities are needed to adequately respond to these challenges that are affecting power quality, asset utilisation, and the maintenance of regulatory code compliance.

This programme of work implements ICT solutions that address power quality issues introduced by DER installations, with a primary focus on enabling code compliance for network end-point voltages, as well as implementing techniques that ensure DER installations can be more effectively integrated into the electricity distribution networks.

Table 57 – Low Voltage Network Management and Integration of Distributed Energy Resources (DER) Program

Project Name	Project Description
Voltage Regulation	Improve power quality management and enable regulatory code compliance by implementing network voltage regulation schemes and integration of Distributed Energy Resources (DER) technologies.
Consolidation of Low Voltage network model to enterprise platform	Improve network reliability, safety and resilience by extending and integrating Low Voltage (LV) network modelling capabilities into the existing PowerOn Fusion distribution management system, consolidating both the Low and High Voltage network models on a single enterprise platform.

Feeder Automation to Enhance Public Safety

AusNet Services has successfully implemented a range of feeder automation capabilities through reliability improvement programmes. The objective of this program is to efficiently leverage existing systems and infrastructure to enable new asset and public safety capabilities which were not previously possible (utilising traditional capabilities) but are now being enabled via newly introduced field device capability and data analytics availability.

The specific focus of this program is to reduce and prevent the electrocution risks to the public and livestock when a live HV conductor falls to the ground, by successfully detecting the network incident, the approximate location, and automatically isolating the faulted segment using the SCADA system.

Network contingency based capabilities will also be introduced by extending the existing distribution automation capabilities to better manage the impact on assets and customers during network abnormalities.

Table 58 – Feeder Automation to Enhance Public Safety Program

Project Name	Project Description
Feeder Automation to Enhance Public Safety	Enhance and deliver new Feeder Automation capabilities, accurately identifying the location of various types of faults that could cause safety issues to the public, damage to either AusNet Services' or customer's assets or parts of the network.

Network Analytics and Visualisation

The rapid growth of domestic photovoltaics (PV) generation and domestic Electric Vehicle (EV) charging introduces new safety and compliance issues. High PV penetration may cause bidirectional / reverse power flows giving rise to key issues related to overvoltage, transformer and network overloading and voltage unbalance.

The program focuses on improving operational and asset management activities, particularly where there are public safety or bushfire implications, code compliance issues around power quality and/or existing or evolving asset utilisation constraints.

This is to be achieved by:

- Implementing data analytics solutions and information visualisation techniques, enabling condition monitoring of transformers, network connections and fuses, reducing transformer failures, network outage times, wire-downs and fire starts.

- Leveraging, aggregating and transforming increasing amounts of data from Smart Meters to generate useful, consolidated information, enabling advanced asset performance and network management activities.

Electricity Distribution Network – ICT Strategy

Table 59 – Network Analytics and Visualisation Program

| Project Name	Project Description
Consolidation of data source infrastructure to support Network Management decision making	Leverage of the metering data warehouse infrastructure to enhance the Distribution Outage Management System information datasets to support enhanced decision making on network management.
Metering and Network Management Integration and Visualisation	Enabling metering data and outage management integration and visualisation to enable granular insights into network outages to the meter level.

__Network Management ICT Lifecycle Management__

The prudent lifecycle replacement of network management applications in alignment of asset life cycles and ensuring compliance to business and vendor support requirements.

Table 60 – Network Management Lifecycle Management Program

Project Name	Project Description
Lifecycle Management of SCADA Systems	Replace the existing hardware, application software and tools in alignment with asset management lifecycles, to reduce additional OPEX costs associated with extended maintenance support for end of life technology.
Lifecycle Management of Outage Management Systems	Replace existing applications and tools in alignment with asset management lifecycles to ensure prudent management of Customer Outage Management System assets, to maintain system reliability, minimise outage times and reduce approval process complexity.
Lifecycle Management of Spatial GIS Management Systems	Replace existing applications and tools in alignment with asset management lifecycles to ensure prudent management, capture and storage of distribution geospatial data and records that supports the Customer Outage and SCADA systems, maintain system reliability, reduce increased costs associated with supporting end of life applications, and decrease security risk.
Lifecycle Management of Other Network Management Systems	Replace existing applications and tools in alignment with asset management lifecycles to ensure prudent management, capture and storage of network management information, maintain system reliability, reduce increased costs associated with supporting end of life applications, and decrease security risk.

Electricity Distribution Network – ICT Strategy

Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 61 – Network Management Timeline of Proposed Projects
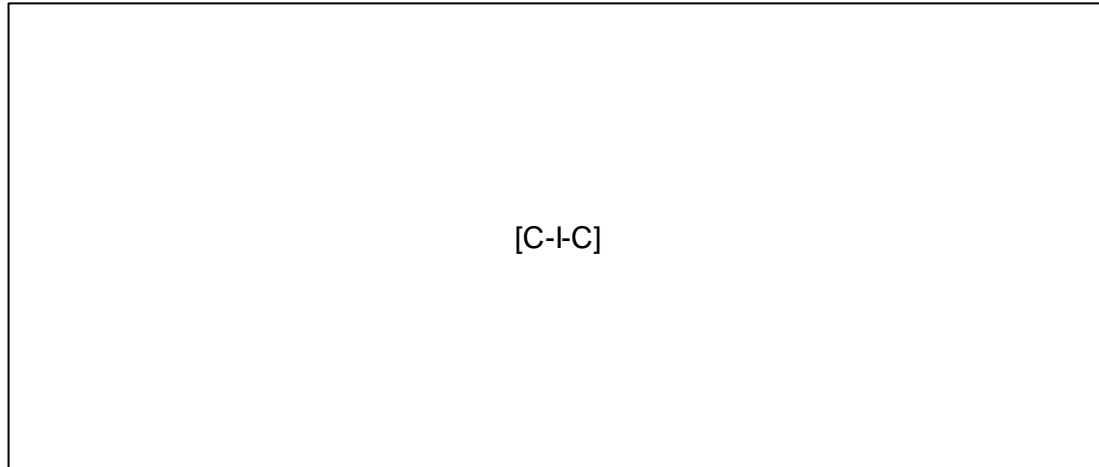
[C-I-C]

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

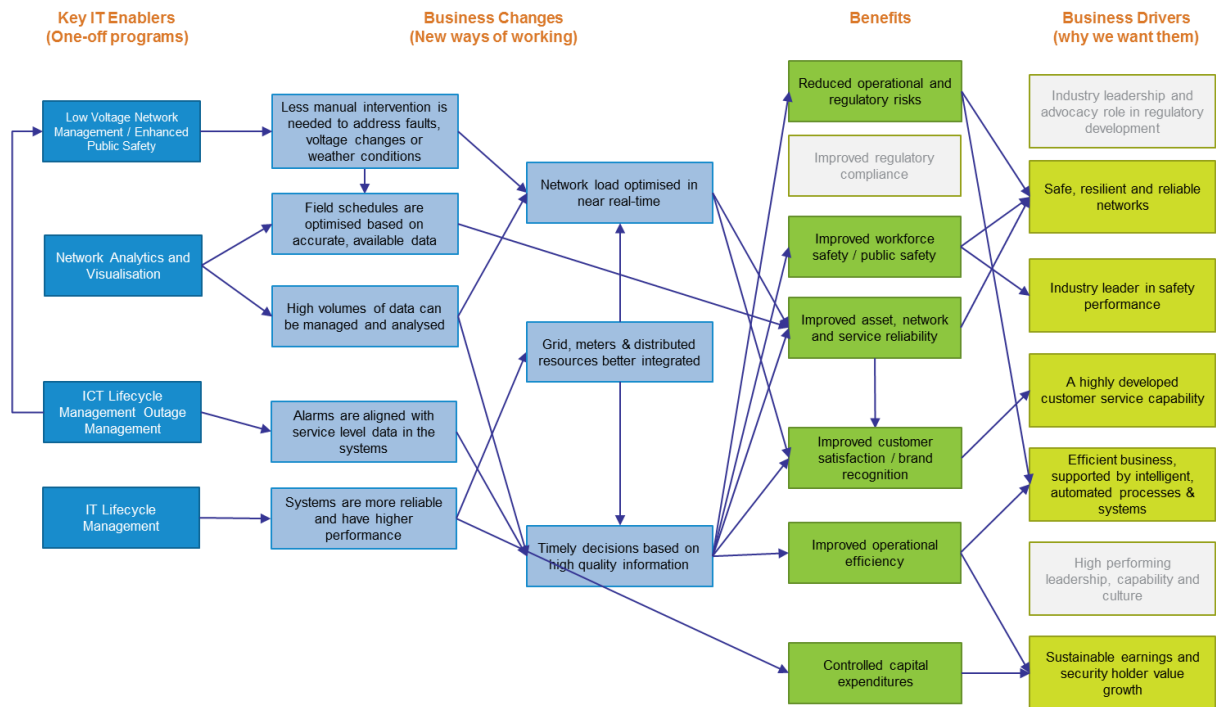**Table 62 – Network Management Program Forecasted Costs**

Project Name	Labour	Materials	Contracts	Total Capital Spend
Voltage Regulation	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Consolidation of Low Voltage network model to enterprise platform	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Feeder Automation to Enhance Public Safety	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Consolidation of data sources to support Network Management decision making	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Metering and Network Management Integration and Visualisation	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Management of SCADA Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Management of Outage Management Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Management of Spatial GIS Management Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Management of Other Network Management Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 63 – Network Management Program Business Benefits

Options Analysis

The Network Management program focuses on the implementation of network voltage regulation, monitoring and modelling solutions, as well as data analytics and visualisation tools and replacement of end of life systems. This program will address increasing safety and compliance issues related to unbalanced network voltage, provides the opportunity to leverage extensive metering datasets from smart grid technologies and will replace aging systems nearing end of life.

Therefore, AusNet Services considers this expenditure critical to better monitor and manage load current flows and voltages, support network management activities with reliable and stable systems and integrated, quality metering data, ultimately ensuring network safety, resilience and reliability. The consequences of doing nothing are:

- Inability to effectively manage network performance, particularly unbalanced voltages, compromising network resilience, safety and reliability.

- Inability to leverage large volumes of metering data available to improve management of existing network and asset risks, operational response and compliance with customer service obligations.

    o Increased system failure, leading to prolonged recovery times non-compliance with Service Level Agreements and impacts to critical business processes.

- Increased operating expenditure related to fixing and supporting incidents of system failure, especially in the absence of vendor technical support. Not replacing the system increases the probability of, increased maintenance and support costs.

- Increased security vulnerabilities (including cyber-attacks) and expensive customisation to meet business needs.

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- Limited functionality and features potentially required to support business operational goals.
- Increased outage times and safety risks to workforce, consumers and community.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 64 – Network Management Risk Assessment

Risk	Consequences
Risk 1: Failure to meet regulatory requirements and standards to meet network up time (e.g. SAIDI / SAIFI)	Financial penalties and/or loss of licence, and major increase in customer power quality complaints, damaging corporate brand and customer satisfaction
Risk 2: Network overload, particularly during peak conditions and overall inability to manage network performance	Failure of or damage to Electricity Distribution network infrastructure (e.g. transformer and network failures, network overheating or loss of efficiency), compromising network safety, resilience and reliability, workforce and community safety, customer service delivery and experience
Risk 3: Legacy systems reach end of life and maintenance / support cease being provided by vendors	Systems become susceptible to security and reliability compromise, meaning issues (e.g. bugs, cyber-attacks) that would otherwise be remediated with the release of security and software patches and service packs by the vendor. If a system fails, recovery could be lengthy and impact day to day operations and business continuity Unmaintained, out of date systems have the potential to increase maintenance and support costs.

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Information Management

Business Reason

The purpose of this program is to build data and analytics capabilities to improve the management of AusNet Services networks and assets. The program addresses the most fundamental challenges to provide the right information to the right person at the right time and the right place - to enable prudent decision making and efficient business processes.

A key objective is to establish a "single source of truth" for the organisation by ensuring a consistent view of all data throughout the organisation. Effective and efficient analysis of reliably stored data will provide valuable information to improve network safety and asset management. Importantly the enterprise governance of data, processes and technology will also augmented to ensure current and future requirements are met.

AusNet Services is operating within an industry confronted by a number of challenges, causing fundamental shifts in the regulatory, operating and market environments.

Customer and regulator expectations are continuing to increase and change, especially in terms of convenient and flexible access to accurate data. Energy customers continue to expect a reliable supply at a reasonable price while increasing their expectations about levels of service and how they are informed about their accounts, billing, energy consumption and outages. Similarly, regulatory requirements place greater emphasis on the discoverability of key information for regulatory enquiries, submissions and claims.

The introduction of new technologies such as smart meters, distribution automation and grid equipment also drastically increase the amount and complexity of data that flows across the different business systems.

The key business objectives of this program of work are to augment AusNet Services' Information Management Capabilities as follows:

- To have the assurance that common data reconciles across all systems;

- To have the ability to trace the flow of information;

- To improve data integrity and quality across the entire enterprise environment;

- To reduce the complexity in information management through enterprise wide data standards;

- To have sufficient capacity to meet data growth projections (structured and unstructured);

- To have the right tools that are able to meet business information, access and analytical needs.

Scope

The scope of programs and respective projects are described below.

The information management capabilities delivered will span across the entire information lifecycle; a lifecycle that encompasses how information is created, stored, governed, moved, secured, used and retired. To do so AusNet Services has identified four main strategic initiatives that each comprises several sub-initiatives aiming at delivering the necessary capabilities as described below:

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Enterprise Data Creation, Storage and Integration

This strategic initiative focuses on the delivery of the necessary standards, processes and governance to ensure that AusNet Services has a consistent data structure that enables accuracy and interoperability across various data source systems. This strategic initiative will deliver the foundational capabilities that are required to create, store and move the data in a consistent way across the entire organisation.

Table 65 – Enterprise Data Creation, Storage and Integration Information Management Program

Project Name	Project Description
Business Information Model Adoption	Adoption of Common Information Model to future proof integration capability with standards based approach. Deploy core interfaces to Network Management Systems.
Data and Process Design, Governance and Implementation	The integration, consolidation and refinement of existing data models across numerous toolsets to enable full management of separate data models. The set up and establishment of the necessary standards and processes to support reference data management toolsets building data stewardship and ownership.

Improve Data Quality

This strategic initiative focuses on monitoring data quality to ensure consistency on how data is entered, stored managed and governed. Data quality monitoring through data profiling and remediation is crucial to gather actionable and measurable information about data quality to safeguard the success of business processes.

Table 66 – Improve Data Quality Information Management Program

Project Name	Project Description
Automated Data Quality Remediation	The expansion of existing data quality remediation solution to automatically profile data based on established quality criteria and the remediation of non-conform data that failed quality test to improve quality and make data usable.

Enhanced Decision Making

This strategic initiative focuses on expanding the span of AusNet Services' information delivery capabilities to ensure that enterprise wide business problem supporting effective decision making.

Table 67 – Enhanced Decision Making Information Management Program

Project Name	Project Description
Real-time Analytics & Predictive Analytics	The augmentation of network management capability with advanced analytics platforms and toolsets to enable real-time and predictive analytics that will support enhanced network management.
Data Lake / Advanced Analytics Platform Implementation	Creation of an Enterprise Data lake and integration layer with source systems to enable and manage enterprise data.
Corporate & Regulatory Reporting	The enhancement of AusNet Services' reporting capabilities to develop specific reports with drill downs, data cubes, visualisation that leverages the Enterprise Data Warehouse (EDW) to support enterprise and regulatory processes and enhanced decision making.

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Project Name	Project Description
Key Performance Indicators Reporting	The continuous improvements of enterprise reporting and analytics capabilities by ensuring that dashboards, KPIs, etc, are recurrently updated and aligned to business needs to continuously support enhanced decision making.
Spatially Enabled Dashboard	The expansion and integration of other master data such as spatial data, lightning data, operational data and limit data into the Enterprise Data Warehouse (EDW) solution to increase coverage and provide additional analytics capabilities.
Operational Dashboards and data visualisation	The development of operational dashboards that enable exploitation of integrated datasets such as loading data from field device, customer outage data, environment data (lightning, wind, etc.) and network state data to ensure customer service levels are maintained.
Visualisation of Operational Technology data	The extension of data visualisation to other areas such as geographical (GIS) and operational technology (OT) data to provide the ability to perform complex analysis that will support enhanced asset management and real-time response to network management situations.
Mobile Analytics Capability	The extension of analytics capability to mobile users to deliver analytics capability away from the desk.

Information Management Augmentation

This strategic initiative focuses on expanding existing information management capabilities to ensure that current systems are fit for purpose and can continuously meet AusNet Services' information management requirements while controlling costs.
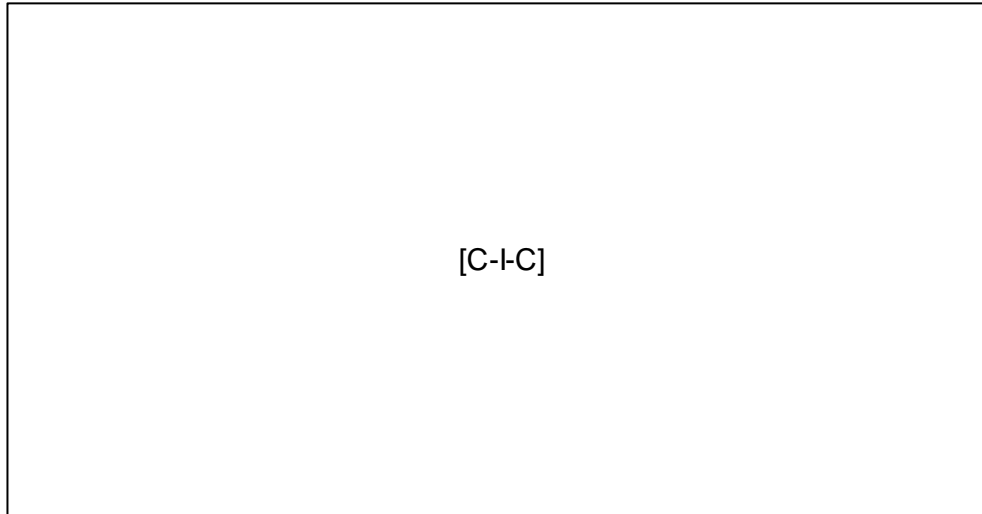
Table 68 – Information Management Augmentation Information Management Program

Project Name	Project Description
Data Lifecycle Management Deployment	The development and the implementation of data classification framework and policies based on internal and external data priority, security, retention and destruction requirements to store, secure, archive and delete data.
Consolidate Enterprise Content and Document Management	The rationalisation and consolidation of content and document management systems to cast a better control over stored unstructured and structured document.
Consolidate Data Warehousing and Reporting Systems	The rationalisation and consolidation of data warehousing and reporting systems to reduce the likelihood of analytics discrepancies and cast a better control over warehousing and reporting environments.

AusNet Services

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Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 69 – Information Management Program Timelines of Proposed Projects

[C-I-C]

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

Table 70 – Information Management Program Proposed Forecast Cost

Project Name	Labour	Materials	Contracts	Total Capital Spend
Enterprise Data Creation, Storage and Integration	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Improve Data Quality	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Enhanced Decision Making	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Information Management Augmentation	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 71 – Information Management Program Business Benefits
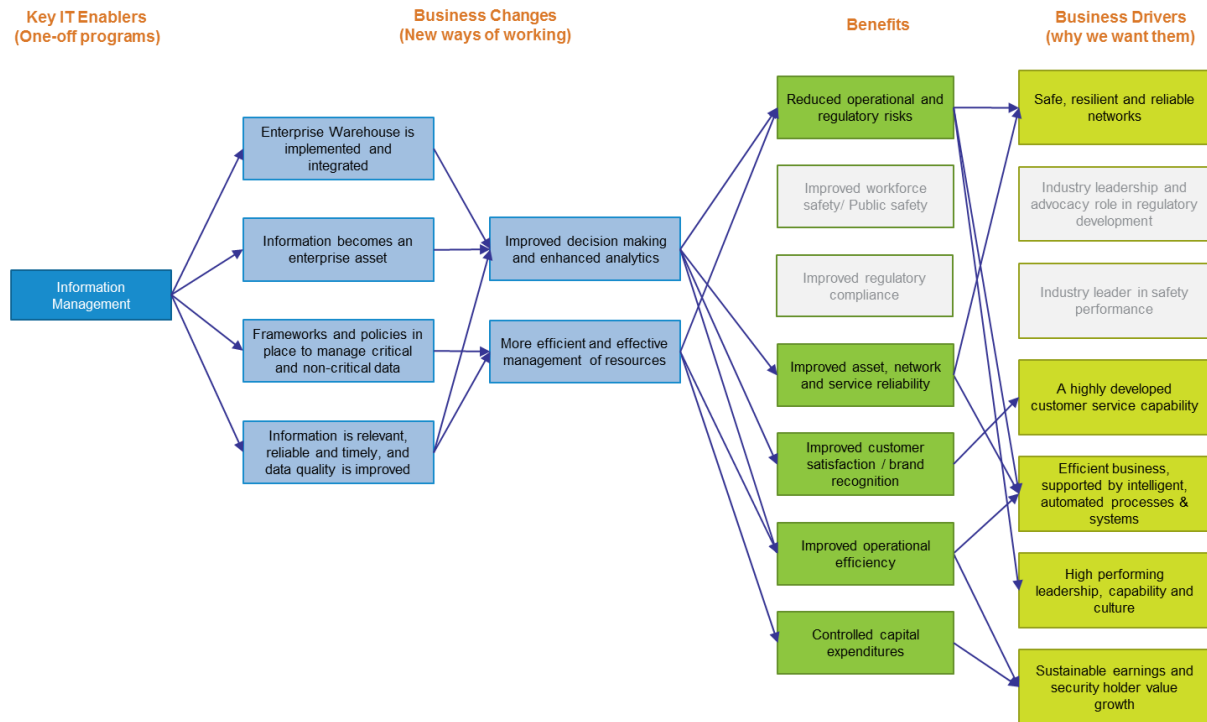
Options Analysis

The Information Management program focuses on the need to deliver a step change in its enterprise-wide information management capability through a focus on improved processes and governance. Supported by incremental and strategic investments in technology that allows the business and stakeholder to benefit from improved management, integration, data quality, analytics and decision making. Therefore, AusNet Services considers this expenditure critical to achieving the benefits stated above and has considered the consequences of doing nothing as follows:

- Inability to respond accurately with sufficient details to AER, or other stakeholders that require AusNet Services to provide information to support customer, regulatory, legal and/or compliance obligations;

- Increased timeframe to turn around information requests with impacts on business processes and efficiencies;

- Increase in operational risk and business exposure associated with security breaches and the loss of data;

- Reduced systems performance and business efficiency and agility;

- Increased cost resulting from inefficient processes to store, manage and retrieve information;

- Increased cost resulting from storage growth of data that is not needed ("Data Debris").

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Risk Assessment

A risk assessment has been conducted, based on the AusNet Services' risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 72 – Information Program Risk Assessment

Risk	Consequences
Risk 1: Inability to respond accurately with sufficient details to AER, or other stakeholder obligations	Potential financial penalties that could damage corporate brand. Loss of overall credibility with the regulator and/or other stakeholders.
Risk 2: Increased timeframe to turn around information requests	The organisation loses its agility and cannot keep up with the pace of information demand from internal and external stakeholders.
Risk 3: Increase in operational risk and business exposure associated with security breaches and the loss of data	Private consumer and commercial data are potentially not protected from misuse such as public publication resulting in financial penalties and damaging corporate brand damage and customer satisfaction
Risk 4: Reduced systems performance and business efficiency and agility	Increased amount of time spent on data collection and integration resulted in a limited time spent on analysis to support enhanced decision making. The organisation losses its agility and cannot keep up with the pace of information demand from internal and external stakeholders.
Risk 5: Increased cost resulting from inefficient processes to store, manage and retrieve information	Increased cost to serve represents higher costs for consumer and/or reduced benefits for the same price. Inefficient processes also increase the risk of AusNet Services being able to fulfill their customer, legal and regulatory stakeholder obligations.
Risk 6: Increased cost resulting from storage growth of data that is not needed ("Data Debris")	Inability to normalise infrastructure growth curve as data storage capacity is quickly surpassed with aged or fully depreciated data.

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Metering and Customer Services

Business Reason

AusNet Services is conscious of new regulatory obligations that have been recently introduced, and anticipate further changes during the period where regulatory obligations will shift to place greater emphasis on customer service and engagement, with the obligation to store and provide end customer information.

Customer expectations are also changing, there is higher demand for information around outages and expectation to communicate and respond to requests for information via multiple channels.[35]

In response to these drivers AusNet Services has designed a business strategy to become a 'Customer Centric Utility'. This period provides the opportunity to leverage core enterprise foundations to further enhance existing customer-centric capabilities and improve the customer experience using integrated applications and streamlining processes.

AusNet Services is cognisant of the directives issued with regards to the Power of Choice regulations. Our core strategic intent is to support the business in providing better services to customers and we will welcome the opportunity to provide changes to systems and processes to enable customers' Power of Choice. As a prudent and efficient organisation, AusNet Services has chosen to capture the strategic intent and costs associated with this 'to be agreed' regulation external to our core ICT strategy submission document.

Scope

The scope of programs and respective projects are described below.

Develop a Customer Centric Utility

In light of increasing regulatory responsibilities, customer demands and smart meter technologies advancements; the objective of a Customer Centric Utility is to effectively and efficiently manage customer, regulatory and stakeholder obligations via a central customer relationship management system (CRM). The program seeks to leverage the enterprise foundation processes and systems by creating a single view of the customer which will be used to improve customer service levels and meet the increasing information needs of customers. The CRM system will also enable regulatory reporting requirements.

Table 73 – Customer Centric Utility Program

Project Name	Project Description
Implement Enterprise Wide CRM	Develop a single view of customer information by establishing an enterprise-wide Customer Relationship Management (CRM) system that will capture key customer information to enhance customer service, interactions and customer experience. The system will also improve safety by enabling visibility (e.g. life support customers), improving outage notifications and faults handling, and ensure workforce safety by identifying site hazard locations.

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[35] Gartner Inc., *Technology Overview for Multichannel Utility Customer Self-Service*, Sept 2012, (confidential) pp. 2 – 3.

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Customer Digital Enablement

The program seeks to refresh and enable communication channels to engage customers via mobile and digital technologies. The improved proactive delivery of information to customers will enable them to make informed decisions. Conversely, information received from customers will be used to drive improved levels of service.

Table 74 – Customer Digital Enablement Program

Project Name	Project Description
Customer Internet Re-platform	Develop the internet website to service customer requests for information (e.g. details update, update) and to deliver mobile content enhancing customer engagement and overall digital experience.

ICT Lifecycle Management Metering & Customer Systems

Prudent (mandatory) replacement of key market and customer systems to be aligned to product roadmaps and future business requirements.
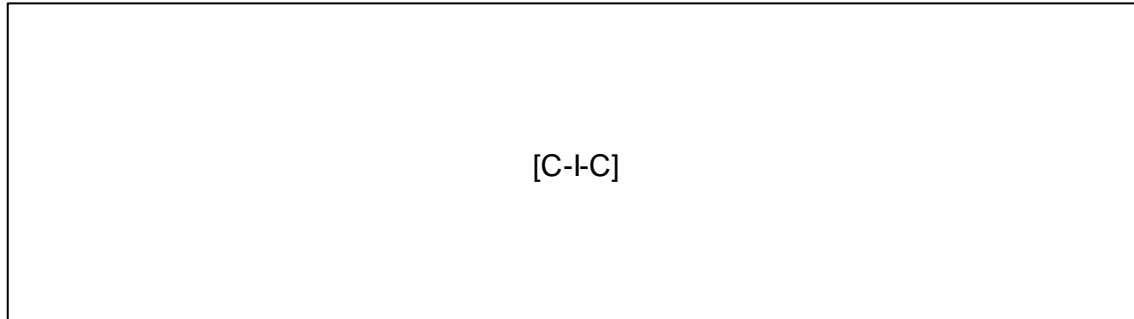
Table 75 – Metering and Customer Services Lifecycle Program of Work

Project Name	Project Description
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of Metering and Business Systems	Replace various meter reading., data management and visualisation tools to ensure that meter data collection, management and analysis platforms are managed in alignment with asset management lifecycles and vendor roadmaps.
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of Metering, Monitoring and Reporting Business Systems	Replace various meter reading., data management and visualisation tools to ensure that meter management and analysis and reporting platforms are managed in alignment with asset management lifecycles and vendor roadmaps.
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of core Metering and Customer Systems	Replace various meter reading., data management, customer and visualisation tools to ensure that metering and customer systems platforms are managed in alignment with asset management lifecycles and vendor roadmaps.

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Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 76 – Metering and Customer Services - Timeline of Proposed Projects

[C-I-C]

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

**Table 77 – Metering and Customer Services Forecast Costs**

Project Name	Labour	Materials	Contracts	Total Capital Spend
Internet Re-platform	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Implement Enterprise Wide CRM	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of Metering and Business Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of Metering, Monitoring and Reporting Business Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
ICT Lifecycle Management – Metering and Customer Systems : Upgrades of core advanced metering infrastructure systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 78 – Metering and Customer Services Program Business Benefits
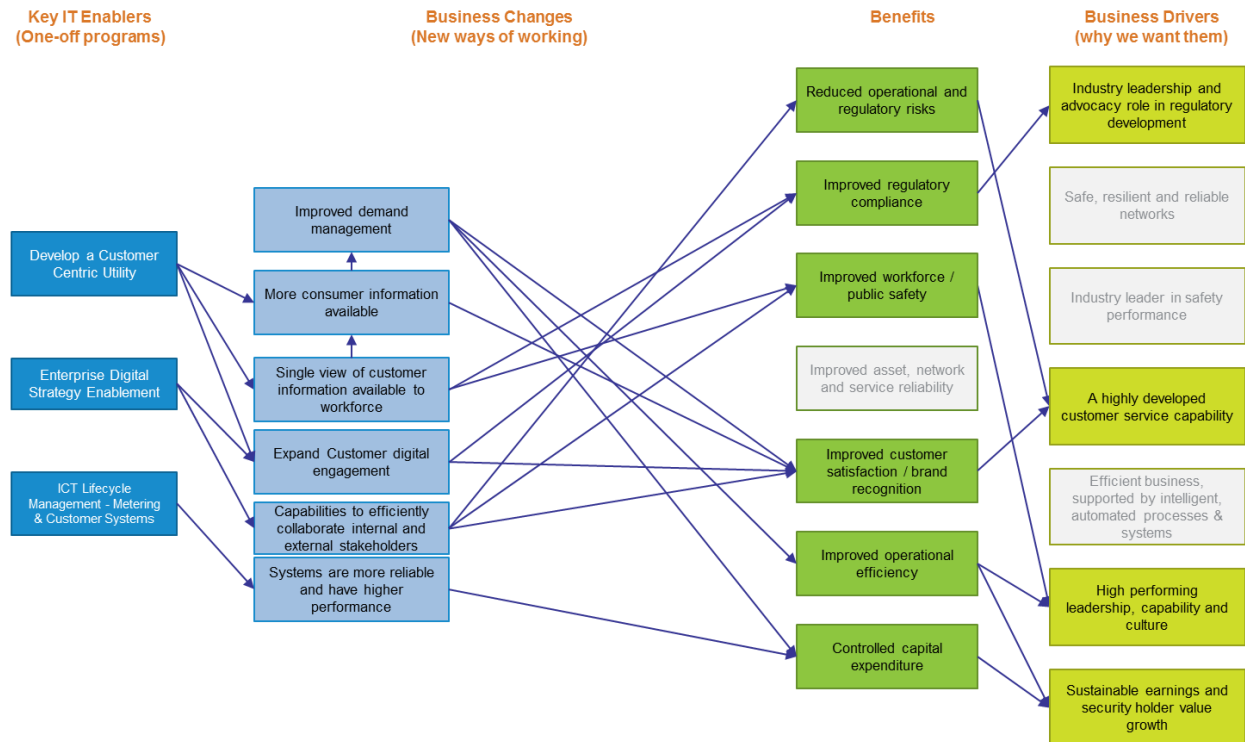
Options Analysis

Doing nothing means current processes will continue unchanged. With the other changes proposed in the market by AEMC this could mean greater overhead for AusNet Services and a reduction in efficiency. This option is not recommended as it will not provide the required timely information between field and office and consequently customer.

The probable consequences of this option include:

- Manual processes will increase and become more complex as it will be required to provide customer and meter data to more parties;

- Unable to reap the benefits of additional technology designed to improve the information flow between field and office and consequently customer;

- Unable to meet customer demands for more readily available and timely information and provide the customer with the value add services they expect;

- Public perception that AusNet Services' customer engagement is outdated when compared to peer organisations;

- Inability to manage safety risks for site visits and life support customers;

- Negative customer and brand experience from customers and external stakeholders; and

- Lack of integrated view of customer and asset information to field staff, resulting in sub-optimal internal management of network jobs and service orders.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 79 – Metering and Customer Services Program Risk Assessment

Risk	Consequences
Risk 1. Continued / increased safety hazards.	Without appropriate visibility to key customer information, safety incidents will continue to occur.
Risk 2: Deteriorating reputation due to poor customer experience driven by inefficiencies.	Loss of customer trust and support for future capital investment.
Risk 3: Data discrepancies between systems due to delays in transfer of information or no/poor interfaces may create inconsistencies and delays in information flow.	Inconsistent and delayed information flow damages productivity and quality decision-making, creates stakeholder frustration, and contributes to negative experience for both internal and external stakeholders.
Risk 4: Market customer data quality is not reliable.	Although the implementation of a CRM will significantly improve the ability to manage customers, if the underpinning data is unreliable it will result in incorrect or inaccurate market data, increased manual processes and unfulfilled corporate and/or regulatory obligations.

Works and Asset Management

Business Reason

The priority of ICT Works and Asset Management program of work is to build on the significant investment AusNet Services has made in the enterprise Assets and Work management solution. The EAM/ERP platform will be leveraged to enable proactive enterprise-wide asset management to support the reliability and safety of the supply, and to improve operational efficiency that will contain price growth.

The increased amount of data generated by new sources represents opportunities to leverage actionable insights that enable preventive works and asset management resulting in sustainable and quality service to the customers. Over the next period, focus will be made on rationalising, consolidating and migrating additional key business processes and systems to further leverage and enrich the EAM/ERP solution delivered.

AusNet Services will extend current functionalities within the EAM/ERP solution delivered to extend field mobility, improving compliance with regulatory obligations and customer expectations. This will be performed by improving the mobile platform to further increase productivity and provides real time two way communication information exchanges with the field which will enhance customer response. Field mobility will also address operational efficiency by providing key information to field worker anytime, anywhere, and to back office for optimum planning and scheduling.

Scope

The scope of programs and respective projects are described below.

Field Mobility for Customer Response and Public Safety

This program seeks to fully leverage the capabilities being delivered by the enterprise EAM/ERP solution, to extend and embed field mobility across AusNet Services and increase the efficient and effective delivery of maintenance work (faults and planned), customer responsiveness and safety of field crews and network reliability. This is to be done by:

- Utilising GPS to efficiently schedule works by locating the nearest vehicle to a fault address and automatic alerts in the field when in close range of an asset which has missing asset information;

- Making operations guides available on mobile devices providing users with step-by-step and up-to-date instructions on how to operate plant and conduct safety checks;

- Providing additional functionality on mobile devices e.g. inventory and planning management;

- Augmenting existing mobile capabilities with prebuilt enterprise mobile applications.

Table 80 – Field Mobility for Customer Response and Public Safety Program

Project Name	Project Description
Automatic Vehicle Location Enablement	Provides the dispatch centre with the location of vehicles to support efficient scheduling of works by locating the nearest vehicle to a given fault/address.
Project 'Mobile Plant Operating Guides'	Delivers mobile-enabled operations guide to provide detailed work instructions of plant operation to field staff.
Extend Mobility for Field Staff	Improve the mobility solution to provide additional mobile functionalities that enable field staff productivity (e.g. Inventory and planning management, Time capture on jobs).

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Project Name	Project Description
Fiori mobility	Provides the user interface toolset to deliver standard back office functionality to field staff users (e.g. Timesheet completion, Purchase order approvals).

ICT Lifecycle Management CAD & Drawing Management Systems

AusNet Services is the custodian of approximately 100,000 Electricity distribution drawings. Drawings support and guide activities related to maintenance and replacement of network assets, therefore contributing to reliability, safety, security of distribution network.   Moreover, AusNet Services has an obligation to provide drawings in response to "Dial Before You Dig" requests by the public.

This program seeks to replace existing drawings and design to maintain system performance, capability and reliability, improving design quality and drawings management and meeting business needs and service requirements.

Table 81 – Works and Asset Management ICT Lifecycle Management Program

Project Name	Project Description
CAD System Replacement	In order to keep the drawing and design system supported, AusNet Services plans to replace the current application in alignment with asset replacement lifecycles.
Drawings Management System (Asset Replacement)	Replace the drawings management system (to provide a fit for purpose, scalable solution that will meet business and external stakeholders needs such as adequate supporting technology for "Dial Before You Dig" services.

Rationalisation of Legacy systems using the EAM/ERP platform

The objective of this program is to improve customer responsiveness, network safety, reliability and comply with regulatory obligations by leveraging the enterprise Works and Asset Management ERP platform to migrate key asset information from standalone applications.

Additionally to define functionality to aid process efficiency and remove manual processes that will increase usability, streamline data entry and enhance decision-making.

This will be enabled by:

- Extending asset classes and further consolidate systems – public lights, protection, communication and control system data for relay settings, fleet, property;
- Leveraging ERP functions and realise benefits – business rules for work orders and notifications, resource demand planning for maintenance planning, financial planning, capacity planning.

Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 82 – Works and Asset Management Program: Timeline of Proposed Projects
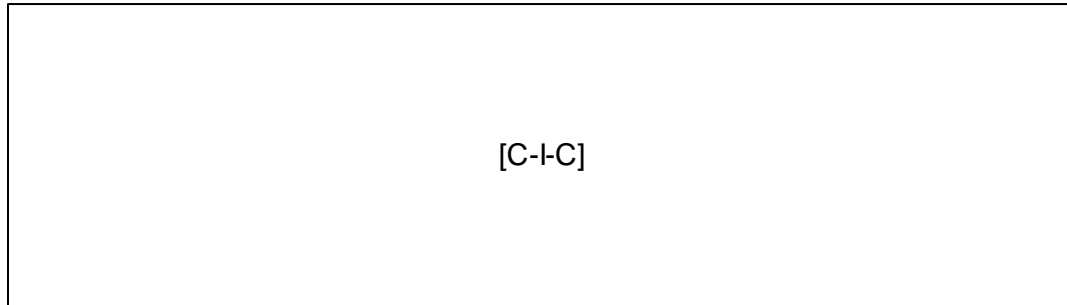
[C-I-C]

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

**Table 83 – Works and Asset Management Program Forecast Costs**

Project Name	Labour	Materials	Contracts	Total Capital Spend
Automatic Vehicle Location Enablement	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Project 'Mobile Plant Operating Guides'	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Extend Mobility for Field Staff	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Fiori mobility	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
CAD System Replacement	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Drawings Management System Replacement	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Rationalisation of legacy systems using EAM/ERP Platform	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 84 – Works and Asset Management Business Benefits
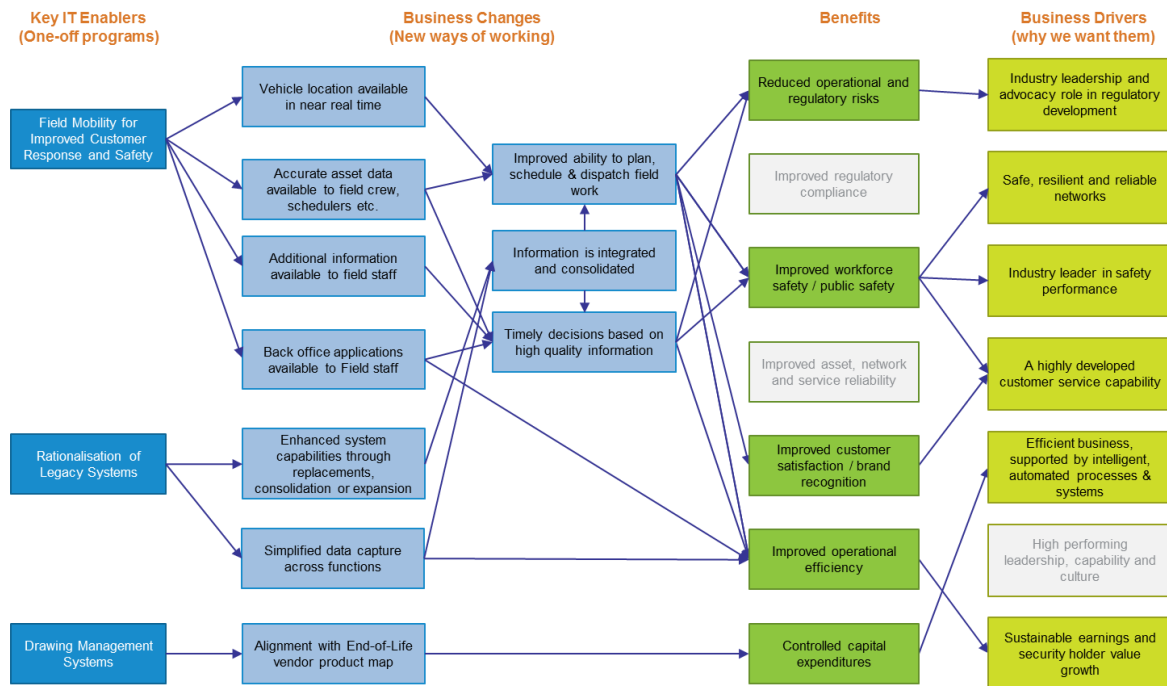
Options Analysis

This program of work seeks to extend the new EAM/ERP enterprise mobility platform and consolidate key asset systems to maximise the value of existing investments, enable additional business processes by realising additional productivity gains and aid risk mitigation. Further improvements to design quality and drawings management, will further meet business needs and service requirements.

The consequences of doing nothing would result in missed opportunities to realise the complete value of existing investments, failure to address existing process inadequacies and controls, and exposure to business and operational risks such as:

- Increased operating cost related to maintaining disparate EAM systems and data.

- Reduced ability to leverage the value of asset data and analytics, for example to support preventive maintenance planning.

- Lost opportunity to deliver efficiencies by automating and supporting manual processes.

Due to lack of technical vendor support for the current CAD system and DMS platform the consequences of doing nothing result in an increased likelihood of experiencing system performance, stability, data and quality issues, and therefore increased risk of failing to meet business, operational and regulatory requirements. The probable consequences of this option include:

- Increased operating expenditure related to ongoing maintenance of the systems, and to fixing and then supporting incidents of system failure, especially in the absence of vendor technical support.

- Increased frequency of system failure impacts the availability and reliability of the systems, compromising the ability to meet service levels and deliver required outcomes.

- Unable to effectively support asset maintenance and replacement programs of work.

- Increasing issues with data quality, availability and reliability because of version control issues, resulting in inefficient work practices (workarounds, rework), safety- and compliance risks.

- Inability to respond to mandatory "Dial Before You Dig" requests in a timely manner, therefore potentially damaging customer satisfaction.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 85 – Key Risks and Consequence Profile

Risk	Consequences
Risk 1. Continue to use several important unsupported application (e.g. Excel spreadsheet, MS Access, Lotus Notes)	Potential loss of key asset data due to unsupported applications.
Risk 2: The current drawing management system cannot store 3D drawing or newer versions of CAD drawings.	Drawings will need to be downgraded in order to be storied, decreasing their quality and accuracy as some information / details are removed (e.g. loss of 3D information).
Risk 3: Unsupported systems may fail and no support or maintenance services will be available to call upon.	Systems become susceptible to performance compromise, run into software related issues (e.g. bugs) that would otherwise be remediated with the release of software patches and service packs by the vendor.

Information Security

Business Reason

This program builds on the security capabilities that are required to protect the Electricity distribution network, and customer and business information. Cyber-security is a serious and ongoing challenge for the energy sector, which is part of the critical national infrastructure. Cyber threats to energy delivery systems can impact national security, public safety, and the national economy. The traditional energy network and supporting technologies allowed the physical separation of the Energy Management System (transmission) and SCADA (distribution) control networks from other information networks. However, as many new components of the future grid are connected together electrically and informatively, the threat of cyber-security has become more challenging.

To bridge the current and the future grid, there must be technology solutions that enable the smart features of the grid to be developed while maintaining the security of the network.

The Information Security program identifies the IT Security capabilities required to support business objectives. The program aims to take advantage of new technologies and capabilities to support the business, extend the reach of IT Security, and maintain the currency of existing IT security components.

The IT Security program consists of four work streams which align to the NIST Cybersecurity Framework (2014) – Identify, Protect, Detect and Respond. Each program of work is grouped into one of these work streams:

- The 'Identify' work stream ensures that sufficient governance is applied to protective technologies and risks are appropriately managed across core processes throughout technology and business. The identify function provides a critical foundation for the cybersecurity framework, that allows the business to better focus its time and resources. AusNet Services has identified the following projects to enhance their current 'Identity' capability:

    o Information Security Governance Risk and Compliance.

- The 'Protect' capability provides processes and technologies that can be deployed to limit or contain the impact of an identified cyber-security threat, in a timely manner. AusNet Services has identified the following projects to enhance their current 'Identity' capability:

    o Enterprise Gateway Security Refresh;

    o Enterprise Identity and Access Management (IDAM);

    o Cryptographic Controls Refresh & Augmentation.

- The 'Detect' capability provides the process and tools which will enable IT Security staff to detect cyber-threats and attacks in a timely manner. AusNet Services has identified the following projects to enhance their current 'Identity' capability:

    o Security Information and Event Management (SIEM) Augmentation;

    o Continuous Monitoring and Diagnostics (CDM);

    o Database Security Controls.

- The 'Respond' capability provides response technologies and processes that allow the organisation to take action against a detected cybersecurity event. AusNet Services has identified the following projects to enhance their current 'Identity' capability:

    o Security Operations Centre (SOC) Toolset Capability.

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The key scope and outcomes of each work stream are outlined below:

Table 86 – Information Security Work Streams and Desired Outcomes

Work stream	Scope	Key Outcomes
Identify	Develop the organisational understanding to manage cybersecurity risk to systems, assets, data, and capabilities	Asset Management; Business Environment; Governance; Risk Assessment; and Risk Management Strategy
Protect	Develop and implement the appropriate safeguards to ensure delivery of critical infrastructure services	Access Control; Awareness and Training; Data Security; Information Protection Processes and Procedures; Maintenance; and Protective Technology
Detect	Develop and implement the appropriate activities to identify the occurrence of a cybersecurity event	Anomalies and Events; Security Continuous Monitoring; and Detection Processes
Respond	Develop and implement the appropriate activities to take action regarding a detected cybersecurity event	Response Planning; Communications; Analysis; Mitigation; and Improvements

Scope

The scope of programs and respective projects are described below.

Enterprise Information Security Enablement

Table 87 – Enterprise Information Security Enablement Program

| Project Name	Project Description
Enterprise Identity and Access Management (IDAM)	Procure and implement a new Enterprise Identity and Access Management (IDAM) solution that integrates all relevant applications. Perform activities over users and devices to restrict access based on privileges and implement segregation of duties (SoD). Directory Consolidation & clean-up of account information. Integrate Enterprise SAP with the enterprise IDAM solution.
Enterprise Gateway Security Refresh	Uplift functionality and consolidate services into a centrally managed, integrated set of security control systems.
Continuous Diagnostic Monitoring	Extend monitoring capabilities for vulnerability assessment. Extend OS and system hardening audit compliance capabilities. Improve virtual system security controls, governance and compliance, specifically: 1. Develop governance toolset to monitor and manage virtual system management and compliance integration with SIEM and GRC tools 2. Implement workflow management and segregation of duties for virtual system management and administration access
SIEM Augmentation	Provide further integration and augmentation to existing SIEM system. Leverage existing ICS/SCADA management system to collect, store and compare configuration of ICS devices (OSI-Pi). Update, enhance and integrate ICS Management System with SIEM to perform additional security services. Extend collection of events by integration of the SIEM to corporate and operational

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Project Name	Project Description
	environment management systems not in scope for initial deployment, including: 1. SAP EAM/ERM/GRC; 2. Database Access Management (DAM); 3. Any new technologies implemented in this reset period (in this document).
Information Security Governance Risk and Compliance	Increase value and coverage of Security Governance, Risk and Compliance (GRC) functionality covering internal assets and operations as well as vendor delivered services. Consolidate outputs and reporting to organisation wide SIEM and security related management reporting, and extend licensing.
Cryptographic Control Refresh & Augmentation	Enable two-factor authentication for remote and local access to HMIs. Deploy certificate based smart keys for ICS engineers and staff.
Database Activity Monitoring	Provide preventative measures to deny un-authorised administrators or escalated privileges to access database content. Provide Data Loss Prevention (DLP) capabilities to protected database instances.
Security Operations Centre	Enhance SOC capabilities to interpret alerts and escalate to incident response team. Supplement capabilities not covered through continuous monitoring and SIEM initiatives.

Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 88 – Information Security Program : Timeline of Proposed Projects
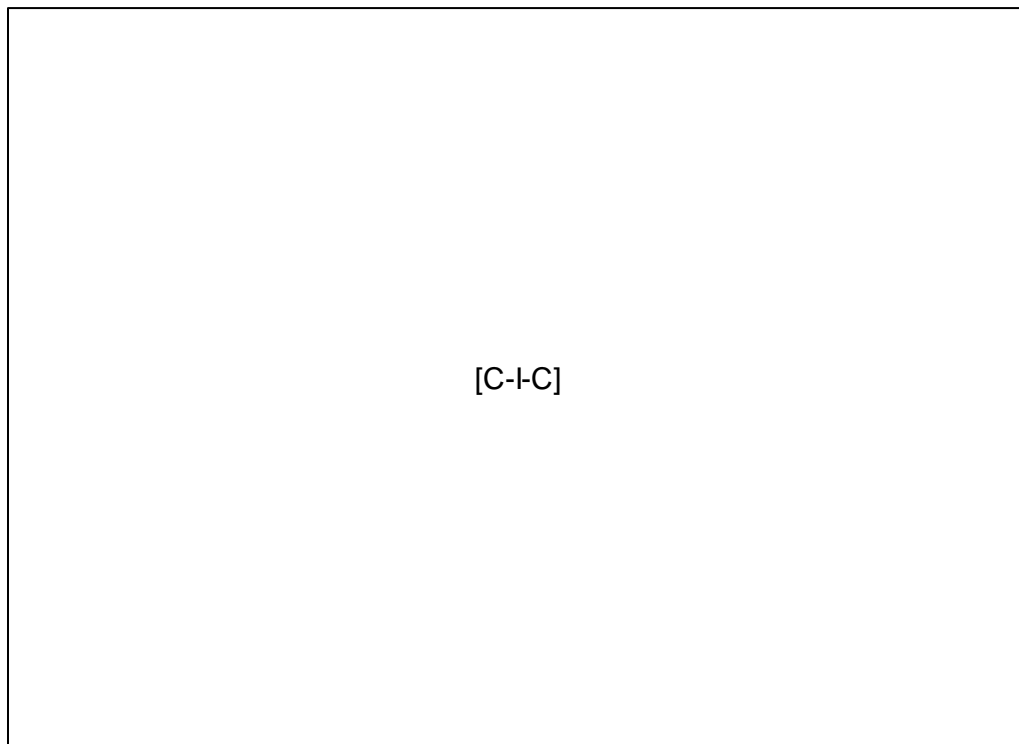
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Electricity Distribution Network – ICT Strategy

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

Table 89 – Information Security Forecast Costs

Project Name	Labour	Materials	Contracts	Total Capital Spend
Enterprise Identity and Access Management (IDAM)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Security Operations Centre	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Enterprise Gateway Security Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Continuous Diagnostic Monitoring	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
SIEM Augmentation	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Information Security Governance Risk and Compliance	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Cryptographic Control Refresh & Augmentation	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Database Activity Monitoring	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 90 – Information Security Business Benefits
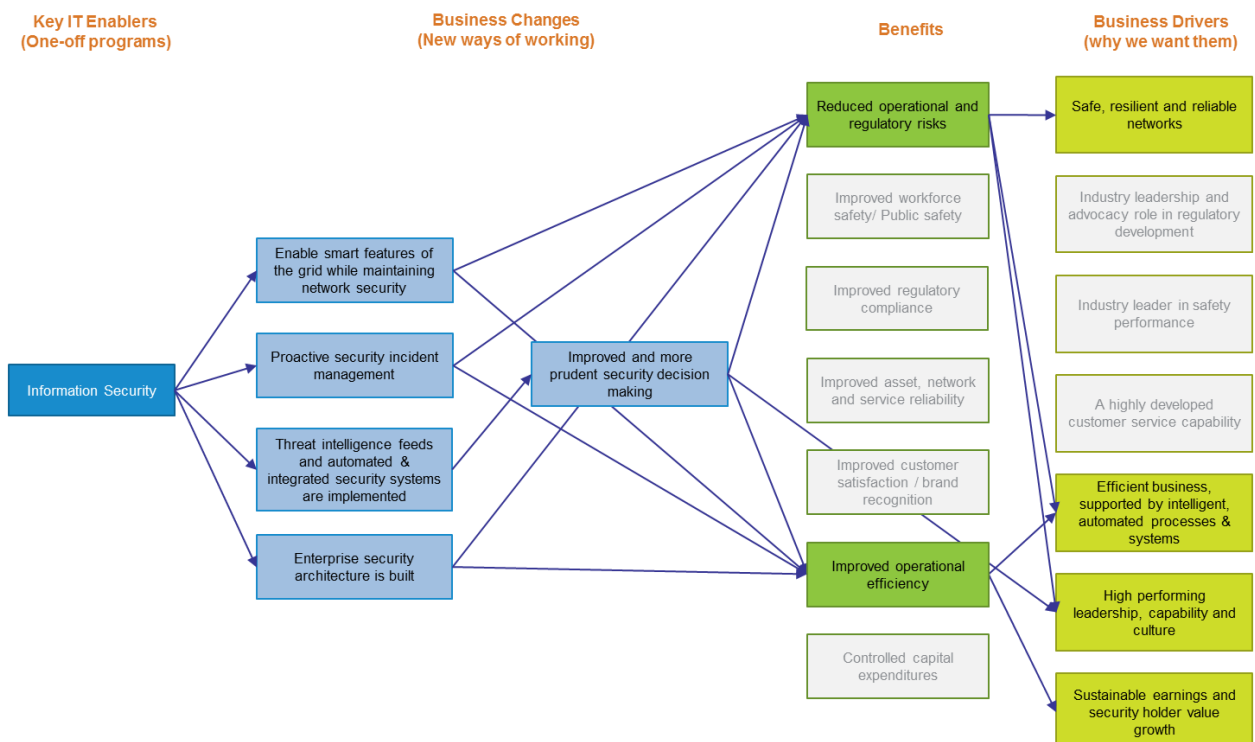
Options Analysis

The Information Security program focuses on delivering security capabilities that are required to protect the Electricity distribution network, and customer and business information ensuring that compliance requirements are met. Therefore, AusNet Services considers this expenditure critical to achieving the benefits stated above and has considered the consequences of doing nothing as follows:

- Increased cyber-attack risk on SCADA infrastructure with the potential to interrupt business critical network management processes;

- No dedicated ability to detect attacks compromising the confidentiality, integrity and availability of service;

- No visibility on service impacts resulting in undetected interruptions and delayed resolution;

- Increased risk for misuse such as public publication of private and consumer information;

- Increased costs associated with rectification activities post attack particularly in the context of business continuity and disaster recovery.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 91 – Information Security Program Risk Assessment

Risk	Consequences
Risk 1: Cyber-attack to SCADA infrastructure	Confidentiality, integrity and availability of AusNet Services' delivery of service is impacted.
Risk 2: Unlicensed software executed on the network	AusNet Services breach software contracts which may lead to financial penalties and legal ramifications.
Risk 3: No visibility of service impacts	Service interruptions go undetected or root cause analysis delayed.
Risk 4: Unauthorised access through users	Exposure of confidential information to unauthorised third parties.
Risk 5: No dedicated ability to detect attacks	Attacks are missed.

Corporate

Business Reason

The focus of the Corporate program of work is to support all business functions to achieve required outcomes by supporting workforce development and collaboration. Additional business function support will also be obtained via the expansion of the EAM/ERP solution to deliver enterprise wide capabilities through process and system changes.

Exponential growth in enterprise data and a centralised EAM/ERP solution provides AusNet Services with a strong foundation to harness key information to prudently and efficiently support the Electricity Distribution business, fulfil customer expectations and regulatory obligations. Over the next period, focus will be made to develop required robust information governance and well-defined data architecture, supported by adequate tools to leverage and exploit data that drive informed decision-making.

A high performing culture and strong capabilities are required to meet current and incoming challenges. Over the next period ICT will expand, centralise and automate organisational capabilities to provide functionality that are required to support workforce development and collaboration that enable strong business execution. Organisational risk will also be addressed by the implementation of new capabilities supported through the EAM/ERP solution.

Scope

The scope of programs and respective projects are described below.

Safety Visibility Management

This program focuses on the strategic support of the MissionZERO safety vision through the implementation of people-focused hazards and risk management systems. Currently, identified hazards and risks are managed using Lotus Notes with limited functionality, creating the risk of operational inefficiency in monitoring and management of safety hazards and risks. Moreover, the current solution is not able to leverage more advanced features and functionalities such as trend analysis of safety incidents for their proactive management and prevention.

Table 92 – Safety Visibility Management Program

Project Name	Project Description
HSEQ Management System	Implement a single system to record, monitor and report on people-focused safety hazards and risks, in a more efficient and automated manner.

Improved Statutory & Regulatory Reporting

This program seeks to leverage the SAP EAM/ERP to improve financial, treasury and regulatory reporting functions and enhance corporate modelling functions, to improve decision-making, support regulatory compliance and enhance data integrity and controls.

Table 93 – Improved Statutory & Regulatory Reporting

Project Name	Project Description
Corporate Model (Corporate Modelling in SAP-BPC)	Integrate the five-year corporate modelling capabilities from SAP Business Planning and Consolidation (BPC) module into SAP EAM/ERP, to enhance and streamline planning, budgeting and forecasting capabilities.

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ICT Lifecycle Management Corporate Systems

This program seeks to replace existing corporate system in alignment with their asset lifecycle and vendor roadmaps to support multiple core corporate business functions.

Table 94 – Corporate ICT Lifecycle Management Systems Program

Project Name	Project Description
Prudent mandatory upgrades of Corporate Business Systems	Replace various treasury, workload automation, risk, content and environment management platforms to ensure that they are managed in alignment with asset management lifecycles and vendor roadmaps.

Enterprise Risk, Governance and Compliance

This program seeks to leverage the ERP to enhance risk management, governance and compliance capabilities in light of new application data models and systems, designed to monitor and reduce organisation risk.

Table 95 – Enterprise Risk, Governance and Compliance Program

Project Name	Project Description
Implement E-GRC Solution	Consolidate systems that provide audit, risk management and compliance management into one integrated solution, and extend Governance, Risk and Compliance (GRC) scope beyond IT controls.

ICT Lifecycle Management Digital Collaboration

This program is to support the overall digital capabilities improvement and workforce collaboration by performing a lifecycle refresh on the intranet platform and collaborations technologies such as Yammer. The improved capability to efficiently collaborate amongst the workforce will enhance decision making with easily accessible information and empower a better support and advocacy for the overall business transformation.

Table 96 – Digital Collaboration Program

Project Name	Project Description
Intranet Platform Refresh	Align the existing Intralogic intranet platform to vendor recommendation and support the future digital capabilities for stakeholder groups.

ICT Lifecycle Management ERP (SAP)

This program seeks to leverage the ERP to improve Enterprise Asset Management for Corporate capabilities.

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Table 97 – Corporate Systems Lifecycle Management SAP Program

Project Name	Project Description
CIS to Enterprise Systems Integration	Integration of customer information systems with enterprise asset management and enterprise resource planning systems

Centralised Employee Management Capabilities

This program seeks to leverage the ERP to implement a Centralised Employee Management solution to provide the systems, processes, and tools to support human resources activities (e.g. employee development, recruitment).

Table 98 – Centralised Employee Management Capabilities Program

Project Name	Project Description
Centralised Employee Management Capabilities	Deliver employee management capabilities including employee management, learning, performance and goals, succession and development, compensation, recruitment and employee records management. This functionality will be used to cultivate AusNet Services' people and culture, provide functionalities to drive greater employee outcomes and enhanced decision making.

Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Figure 99 – Corporate Program Timeline of Proposed Projects
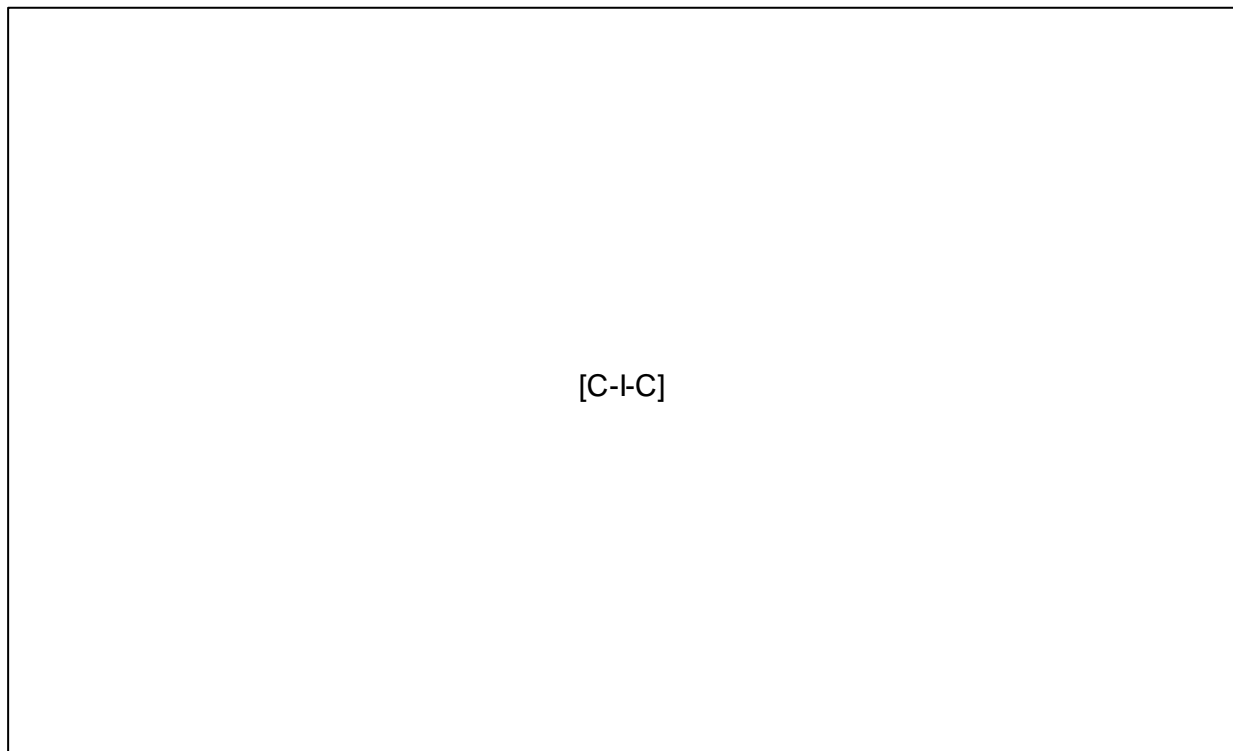
[C-I-C]

Electricity Distribution Network – ICT Strategy

Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

Table 100 – Corporate Program Forecast Costs

Project Name	Labour	Materials	Contracts	Total Capital Spend
HSEQ Management System	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Corporate Model (Corporate Modelling in SAP-BPC)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Upgrade Treasury Solution (Quantum SaaS)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Implement E-GRC Solution	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
ICT Lifecycle Management Digital Collaboration	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Centralised Employee Management Capabilities	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Upgrade Mandatory Corporate Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
ICT Lifecycle Management ERP (SAP)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 101 – Corporate Program Business Benefits
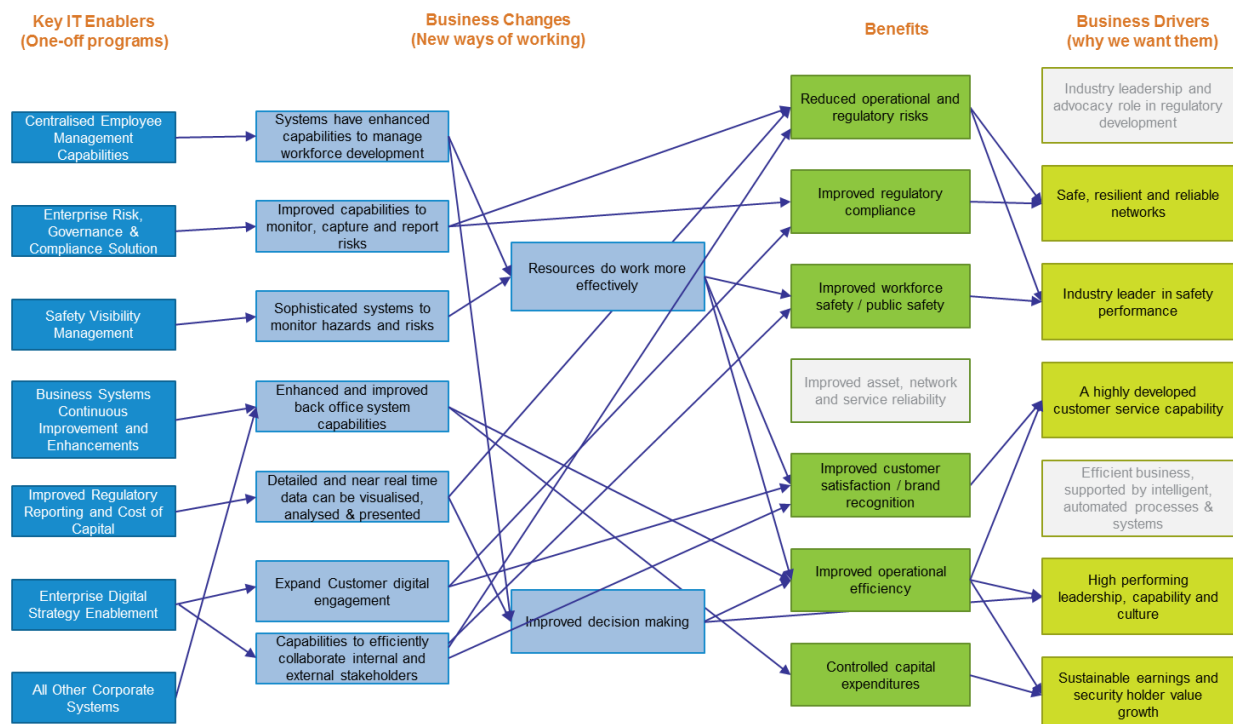
Options Analysis

The Corporate program focuses on the implementation of corporate systems, extension of existing capabilities and replacement of end of life systems, whilst leveraging the enterprise EAM/ERP solution. This will address issues associated with disparate, manual processes and systems with limited functionality and visibility, and aging systems nearing end of life and out of vendor support.

Therefore, AusNet Services considers this expenditure critical to increase operational effectiveness, improve workforce development and collaboration and support all business functions with reliable and stable systems, ultimately developing a high performing culture and strong capabilities to serve customers. The consequences of doing nothing are:

- Inability to support corporate activities in a streamlined and cost-effective manner, leading to mismanagement of risks/issues and inefficient capabilities enable business processes.

- Inability to leverage existing capital investments and maximise benefits realisation.

- Increased system failure, leading to prolonged recovery times, on-compliance with Service Level Agreements and impacts to critical business processes.

- Increased operating expenditure related to fixing and supporting incidents of system failure, especially in the absence of vendor technical support. Not replacing the system in alignment with asset lifecycles, increases maintenance and support costs.

- Limited functionality and features potentially required by future business requirements and processes.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 102 – Corporate Program Risk Assessment

Risk	Consequences
Risk 1: Legacy systems reach end of life and maintenance / support cease being provided by vendors	Systems become susceptible to security and reliability compromise, and run into issues (e.g. bugs, cyber-attacks) that would otherwise be remediated with the release of security and software patches and service packs by the vendor. If a system fails, recovery could be lengthy and impact day to day operations and business continuity. Unmaintained, out of date systems have the potential to increase maintenance and support costs.
Risk 2: Increased cost driven by inefficiencies, manual error and poor data integrity associated with managing unsupported data to track risk, incidents, budgeting, planning activities, and performance management.	If a system fails, recovery could be lengthy and impact day to day operations and business continuity.
Risk 3: Non-compliance with regulatory requirements (e.g. learning, safety)	Financial penalties, increased customer and employee safety risks, and/or loss of licence incurred by failure to maintain mandated training and track certification renewal dates, as well as report on safety risks according to regulatory timeframes.

Electricity Distribution Network – ICT Strategy

Information Technology

Business Reason

The focus of this program of work will be to continue building the ICT infrastructure to support critical business and network systems in alignment with customer expectations and regulatory obligations while increasing operational efficiency and controlling ICT operating expenditure.

Securing information and core service delivery systems is a constant need to ensure optimum business operation. Investments will be made to efficiently store business information with scalable and fit for purpose solution and to secure network and IT systems. Additionally unified communication will be implemented to increase workforce productivity and safety.

A decrease in ICT operating expenditure is required to be aligned to industry benchmark. Over the next period attention will be made to simplify the ICT landscape and to progressively migrate to cloud based services to leverage more cost effective delivery and sourcing models. Desktop virtualisation will also continue to increase asset lifecycle.

Scope

The scope of programs and respective projects are described below.

Data Storage (Lifecycle Refresh, Big Data storage growth and Cloud)

This program refreshes end of life hardware and augments storage capacity with a prudent mix of on premise and cloud storage to lower capital expenditure. The program builds on the 2011-15 rationalisation and virtualisation of servers whilst prudently meeting the increased storage requirements of customer and regulatory data.

The program includes the following initiatives:

- Continue the rationalisation and virtualisation of servers (from 80% to 95% virtual servers - "virtual" cost as small fraction relative to "physical" servers;

- Prudent maintenance of the data centres to leverage prior period investments;

- Lifecycle refresh of storage and back-up hardware;

- Storage growth to allow for the large increase in customer and regulatory data (anticipated 20% yearly growth of data);

- The establishment of cloud storage to mitigate the large increase in customer and regulatory data.

Table 103 – Data Storage (Lifecycle Refresh, Big Data storage growth and Cloud) Program

Project Name	Project Description
Storage Growth (organic and project growth)	Provision of an organic storage and processing growth capacity for the selected storage solution following the replacement of a storage array, resulting in the ability to maintain current performance levels and cater for organic future data growth.
Platform consolidation (incl. Lotus Notes retirement)	Consolidation of hardware and operating system platforms to deliver a 95%-complete lean virtualisation infrastructure, to provide a decrease in CAPEX and OPEX for aged infrastructure, a reduction in risk associated with end of life and out of support applications, and an improvement in visibility and traceability of virtualisation transactions.
Cloud Service Orchestrator	Build upon the Private Cloud orchestration using selected orchestration technology to tie into selected cloud providers.
Cloud Readiness	The selection of an appropriate Cloud Provider that caters for Infrastructure/Platform/Software as a service. The outcome will be the migration and storage of data in a cloud solution.
Data Centre Facilities and Systems	Replacement of end of life infrastructure in data centres and regional offices including computer room cooling systems, no longer compliant switchboards and obsolete data cabling, to reduce operating expenditure by consolidating the number of vendors and reduce risk of outages with new compliant equipment.
Storage and Backup Hardware Refresh	Replacement of storage arrays and migration of data from existing systems to new storage, and the implementation and integration of new backup infrastructure, to improve data management capabilities and reduce OPEX maintenance costs.
SPARC Hardware Refresh	Replace end of life infrastructure with new infrastructure and implement standards and tools for management of Oracle Solaris SPARC infrastructure. This will address current risks associated with aged hardware, and current support and business impacts associated with disparate monitoring and management systems.
Tape Library – Cloud Strategy	Replace the existing Tape Library infrastructure with the most appropriate Long Term on and offsite data protection infrastructure. This will maintain and refresh the Backup infrastructure for data from IT systems.
Storage Fabric Refresh	Determine the most appropriate SAN Fabric solution for current and future infrastructure needs. The new SAN Fabric solution will, at the very least, meet current SAN Fabric capabilities/capacities as well as provide any new beneficial Fabric capabilities.

Lifecycle refresh of other enterprise enablement technologies (customer contact centre, integration layer, databases)

This program refreshes other end of life hardware and software that supports business critical capabilities. During the refresh, consolidations of technologies are reviewed to reduce future capex.

The program includes the following initiatives:

- Lifecycle refresh of the customer contact centre;
- Lifecycle refresh of the enterprise foundation integration platform (EIA);
- Lifecycle refresh of SQL and Oracle databases (including consolidation of databases);
- Lifecycle refresh of printer servers;
- Enterprise service monitoring (OSS - leveraging existing AMI tool).

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Table 104 – ICT Lifecycle Refresh of Other Enablement Technologies Program

Project Name	Project Description
Enterprise Service Monitoring (OSS - extend AMI NetCool to Enterprise)	Enterprise Wide extension of the AMI Enterprise Service Monitoring solution to ensure to ensure SLA's and time to market regulatory requirements are monitored and reported against.
Integration Platform Lifecycle Management	Replace the webMethods enterprise application integration platform to a version that is currently supported by the vendor, resulting in cost avoidance of increased vendor support costs for a previous version and improvements in platform features.
Contact Centre	The delivery of optimum contact center service by renewing the existing customer contact centre system; integrating distribution outage management system(s) for customer outage information; and enabling new forms of communications media & methods.
Lifecycle Printer Server Refresh	Implementation of a 'follow me' printing style solution in order to leverage more efficient, cost-effective, flexible and secure printing facilities. The solution uses a virtual print queue infrastructure, where print jobs are held on a server and released at any printing equipment after users authenticate themselves with their unique security cards, regardless of location.
Oracle Database SOE Refresh (Incl. Consolidation)	Standardise and consolidate all Databases' (excluding AMI) to two versions of Oracle – this will result in a reduction of environment complexity.
SQL Database SOE Refresh (Incl. Consolidation)	Replace the SQL database engine (software) to ensure alignment to the software vendor's product and support roadmaps. This will maintain a supportable landscape which reduces operational risk to the organisation and develop a new standard operating environment (SOE).

**Lifecycle refresh of corporate network and comms**

The prudent lifecycle replacements of network and communications hardware in alignment of asset lifecycle management and ensuring compliance to business and vendor support requirements.

Table 105 – Lifecycle Refresh of Corporate Network and Comms

Project Name	Project Description
Network – IT Router refresh	Replace end of life routers at DC and Remote Sites (excluding the ones overlapping with OMN initiative; encompassing all the WAN routers, VOIP gateways and tunnel termination routers), multilayer core switches for CBD sites and Data Centre Internet and DMZ Routers.
Network – IT Switch refresh	Replace end of life switches, redesign and implement next generation Data Centre Switching infrastructure and interconnectivity.
Network – IT WAN optimiser refresh	Replace end of life WAN devices and cater for future WAN traffic growth at Branch offices, and analyse, design and implement appropriate WAN optimisation capability to cater for future high speed Cloud partner uplink connectivity.
Network – IT Wireless Infrastructure	Replace WLAN network to ensure that the wireless infrastructure continues to be fit-for-purpose and deliver cost-effective, optimal performance to the business.

Project Name	Project Description
Lifecycle Refresh of Gateways incl. Consolidation (Telstra to MPLS) [ex Communications Network Gateway Consolidation]	Replace end of life hardware and associated software and roll out a consolidated solution that collapses multiple physical gateways into domain based consolidated gateways. Domains will be grouped by application type initially through the implementation of the dedicated gateway domains including an inter-DC link.
Lifecycle Refresh of Networks incl. Convergence (OMN) [ex Operational Management (HiSec) Network Replacement]	Replace end of life networks equipment and converge 3 separate comms networks (i.e. Corporate, HiSec and AMI) into one, to continue to support existing networks, improve network performance, resilience and availability and cater for new requirements including additional networks.
Lifecycle Refresh Enterprise UC and Telephony	Replace end of life of unified communications and telephony equipment (e.g. enterprise VoIP telephony assets, meeting room projectors and audio components) and integrate workforce mobility and collaboration features that work seamlessly, reliably and intuitively with telephony/VoIP platform(s).

Lifecycle refresh of enterprise server and standard operating environment (SOE)

This program of works focuses on creating the required virtual infrastructure to support ICT capital expenditure reduction by increasing ICT asset lifecycle and to reduce operational risks by enabling sensitive information to be stored in virtual infrastructure rather than personal devices.

Table 106 – Lifecycle Refresh of Enterprise Server and Standard Operating Environment (SOE) Program

Project Name	Project Description
Desktop / Laptop refresh (incl. Thin Client)	Move to a Thin Client device model to reduce the client landscape complexity and decrease reliance on the client, enabling user flexibility and ability to use a more cost effective platform without being restricted to a standard operating environment.
Enterprise Server Refresh including (inc VDI Enhancement)	Virtual Infrastructure (VI) hardware platform refresh to enable Virtual Desktop Infrastructure (VDI) and to facilitate cloud services, server-based computing (Thin Client) and BYOD capability for end users. The VDI solution provides improvements in data security by storing client systems' data in data centres.

Timeframes

Indicative timeframes for the implementation of proposed projects are illustrated in the timeline below.

Electricity Distribution Network – ICT Strategy

Figure 107 – Information Technology: Timeline of Proposed Projects
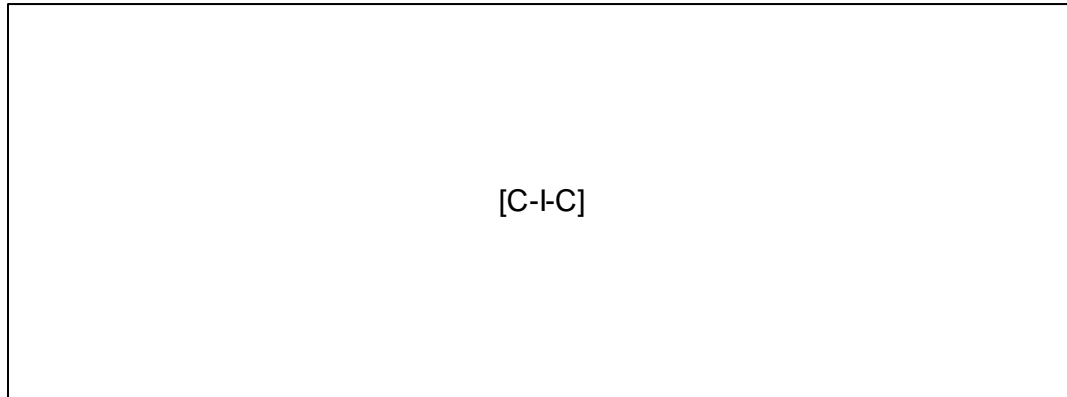
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Forecasted Costs

Forecasted capital expenditure for the implementation of proposed projects is tabulated below.

Table 108 – Information Technology Program Forecast Costs

Project Name	Labour	Materials	Contracts	Total Capital Spend
Organic Storage (including project growth)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Platform Consolidation (Inc. Lotus Notes retirement)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Cloud Service Orchestrator	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Cloud Readiness	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Data Center Facilities and Systems	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Storage and Backup Hardware Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
SPARC Hardware Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Tape Library – Cloud Strategy	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Storage Fabric Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Enterprise Service Monitoring (extend IBM NetCool to Enterprise)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Integration Platform Lifecycle Management	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Contact Centre	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Printer Server Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Oracle Database SOE Refresh (Incl. Consolidation)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
SQL Database SOE Refresh (Incl. Consolidation)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Network – IT Router refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Electricity Distribution Network – ICT Strategy

Project Name	Labour	Materials	Contracts	Total Capital Spend
Network – IT Switch refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Network – IT WAN optimiser refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Network – IT Wireless Infrastructure Refresh	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Refresh of Gateways incl. Consolidation (Telstra to MPLS)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Refresh of Networks incl. Convergence (OMN)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Lifecycle Refresh Enterprise UC and Telephony	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Desktop/Laptop Refresh (inc Thin Client)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**
Enterprise Server Refresh including (inc VDI Enhancement)	$[C-I-C]	$[C-I-C]	$[C-I-C]	**$[C-I-C]**

Business Benefits

Benefits expected to be realised from the delivery of this program are illustrated below.

Figure 109 – Information Technology Program Business Benefits
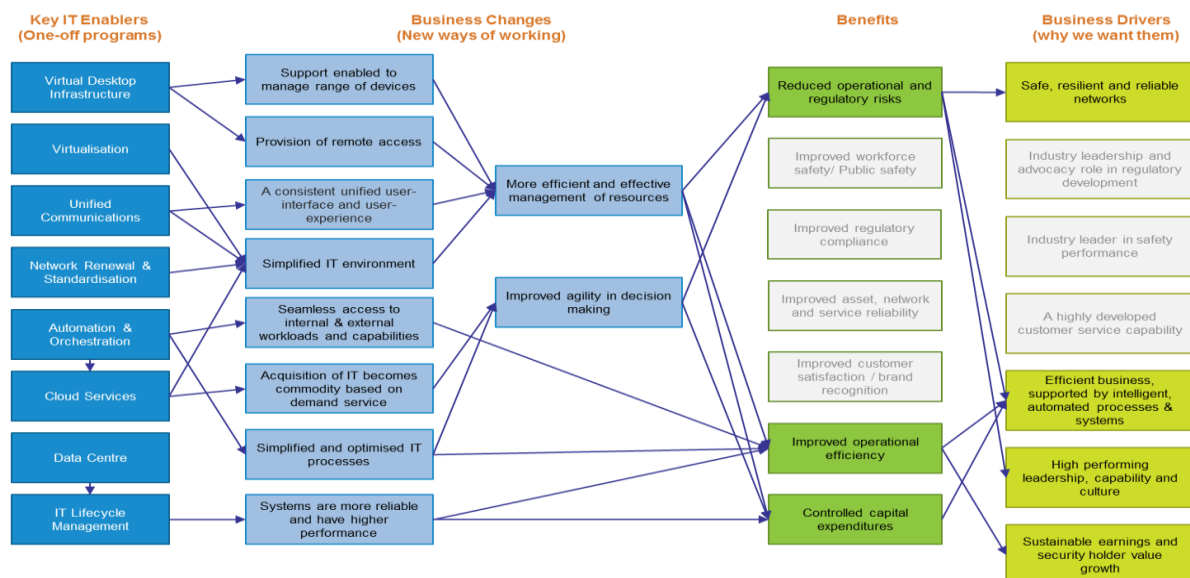
Options Analysis

The Information Technology program focuses on upgrading core systems and technology infrastructures to substantially reduce risk and meet future requirements. Therefore, AusNet Services considers this expenditure critical to achieving the benefits stated above and has considered the consequences of doing nothing as follows:

- Increased operating expenditure related to ongoing maintenance of the systems, and to fixing and supporting incidents of system failure, especially in the absence of vendor technical support;

- Inability for systems and infrastructure to cater for future requirements, especially data storage growth;

- Reduced systems performance and business efficiency and agility.

Risk Assessment

A risk assessment has been conducted, based on the AusNet Services risk management frameworks, to highlight the risk of doing nothing and not proceeding with this program. Key identified risks and associated consequences have been tabulated below.

Table 110 – Information Technology Risk Assessment

Risk	Consequences
Risk 1: Non upgraded systems may limit alignment to future requirements.	Systems become non fit for purpose and cannot adequately support the organisation.
Risk 2: Unsupported systems may fail and no support or maintenance services will be available to call upon.	Systems become susceptible to performance compromise, run into software related issues (e.g. bugs) that would otherwise be remediated with the release of software patches and service packs by the vendor.