AusNet Gas Services Pty Ltd

Gas Access Arrangement Review 2018–2022

Appendix 6A: Technology Strategy Gas Distribution Network – Public

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AusNet Electricity Services Pty Ltd

Gas Distribution Network: Technology Strategy CY2018 - 2022

Submitted: December 2016

Documentation Distribution

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1. Executive Summary

The Technology Strategy outlines the strategic direction and forecast capital expenditure to deliver AusNet Services' Technology capabilities for the Gas Distribution Network in the Gas Access Arrangement Review (GAAR) CY2018 - 2022 access arrangement period.

1.1 Technology Drivers and Priorities

The key drivers of the Technology Strategy are:

- Leveraging the enterprise foundation that has been established in the current period;
- Continuing to transform technology through a cost effective and agile delivery approach;
- Ensuring close governance of technology asset lifecycle investments;
- Continuing the foundational investment in Information security, Information management; and safety; and
- Working with partners to get the most value for customers.

In conjunction with the above drivers, AusNet Services recognises that significant market trends and uncertainties will impact the business operations of technology. As a consequence, effective responses must also be implemented to:

- **External Drivers** such as greater exposure of the domestic gas market to international markets which is likely to result in increased retail gas prices; adapting to changing customer needs and expectations; maximising value from existing investments and tools, and emerging and increasing security risks including cybersecurity risks.
- **Technology Drivers** such as shifts in the IT landscape (new IT vendor business models that include enhanced use of cloud computing and As A Service [XaaS] models); information security and the importance of building capabilities to protect the technology network from cyber-intrusion; the importance of big data and harnessing information to enable business decisions; demand for new mobility solutions that focus on access anywhere anytime; increased reliance on asset information and management and control of the network.

In response to these drivers, the priorities for Technology in the CY2018 - 2022 access arrangement period are:

- **Leverage Core** – simplify the technology landscape, proactively decommissioning aged technology;
- **Information Enablement** – build data and analytics capabilities enabling information led decisions;
- **Communications Enablement** – build communication capabilities enabling management of our networks and assets;
- **Security Enablement** – protect our customer and business information, revenue and brand partnering with Risk & Assurance; and
- **Customer Enablement** – build services valued by our customers and partners with technology integrated to our core.

1.2   Current Period Performance

In the current period, AusNet Services made a significant and successful step in delivering an enterprise-wide foundation across asset and resource management, consolidating and standardising technologies and supporting business processes to promote a more collaborative and effective operating model.

The technology capex investments have delivered the following capabilities:

- Enterprise Asset Management / Enterprise Resource Planning (EAM/ERP) transformation;
- Replacement, consolidation and/or integration of core systems;
- Remote and secure access to centralised documents;
- Enhanced data warehouse capabilities and better data visualisation; and
- Replacement, rationalisation and/or extension of IT infrastructure assets.

For the CY2013 – 2017 access arrangement period, AusNet Services' actual (and estimated) capex spend is $58.20m against an AER determination of $61.26m. This represents a forecasted underspend of $3.07m. (2017$ including overheads). The below graph shows yearly actual capex (and estimated) against the AER Determination.

Figure 1 – AER Determination vs Actual/Estimated Capex GAAR (CY2013 – 2017)
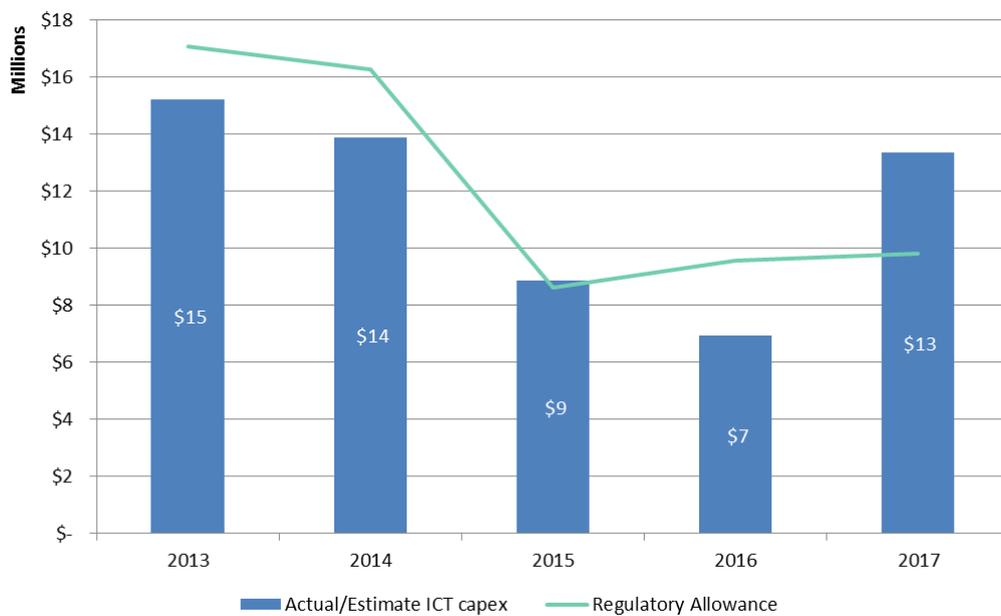
Amounts are 2017$ direct (including overheads)

For further information on current period performance please refer to **Appendix B: Current Period Capex**.

1.3   Forecasted Period Capex

The focus in the forecast period (CY2018 - 2022) will be consolidation of further business functions into the EAM/ERP solution to leverage the enterprise foundation implemented in the current period, and completion of high priority lifecycle management projects.

There are seven domains under which key programs of work will be undertaken:

- **Information Technology** – aims to control technology 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.
- **Information Management** – aims to improve the management of networks and assets through improved data and analytics capabilities;
- **Information Security** – aims to protect distribution network, and customer and business information through enhanced 'protect and detect' capabilities;
- **Metering and Customer Services** – aims to meet customer demand for information and communication through a centralised customer relationship management solution, lifecycle management and consolidation of business processes into the EAM/ERP solution, and enhanced digital capabilities;
- **Works and Asset Management** – aims to improve network reliability by leveraging the EAM/ERP investment to rationalise, consolidate and optimise business processes;
- **Network Management** – aims to complete high priority lifecycle management of key network systems in line with the technology lifecycle and vendor roadmaps to support the reliability, safety and security of the gas distribution systems; and
- **Corporate** – aims to fully leverage the EAM/ERP solution including providing a secure and consistent view of data throughout the organisation.

The forecast cost of the above CY2018 - 2022 capex is $60.27m (2017$, including overheads). The annual forecast by program is shown in the graph below and highlights a number of high priority programs or projects (primarily lifecycle) which have been scheduled in the first three years. A reduction in technology capital investment is expected following the initial investment in core lifecycle management.

Figure 2 – Proposed Yearly Capex by Program of Work for GAAR CY2018-22
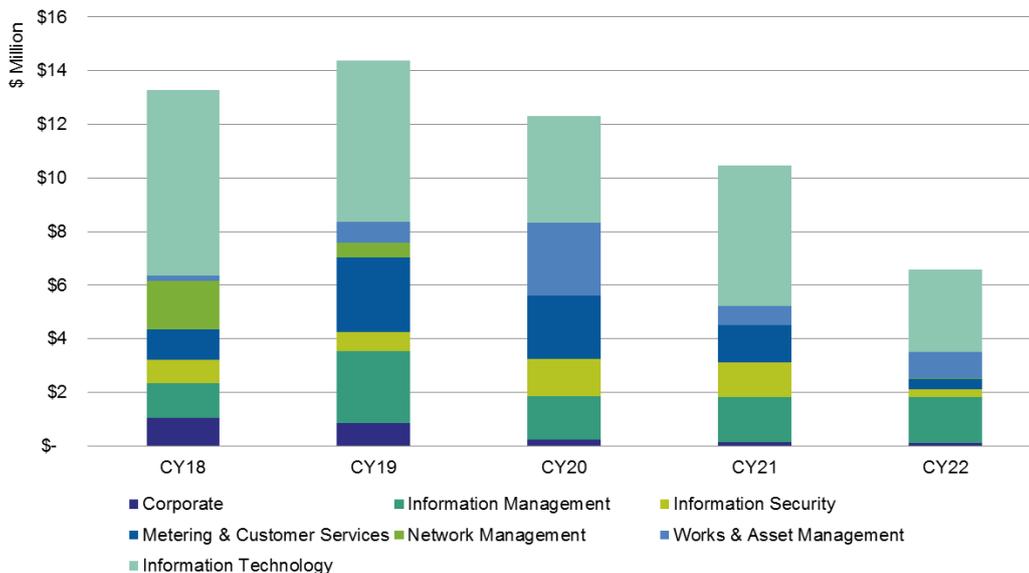
Amounts are 2017$ direct (excluding overheads)

1.4   Benefits and Outcomes

Technology will continue to play an increasingly critical role in supporting business at AusNet Services. AusNet Services will invest in key programs of technology capital works to leverage and extend the existing capabilities to fully realise the benefits of current technology investments and deliver improved network service.

The key benefits and outcomes expected from the programs of work are:

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

- A simplified IT landscape through consolidation of systems into the EAM/ERP solution;

- Improved workforce / public safety through more mature field operations and improved safety management;

- Improved compliance through enhanced reporting capabilities;

- Prudent lifecycle management of core business and technology systems;

- Improved field mobility services to support the effectiveness of field operations and support network management;

- Improved security through automated security monitoring and proactive security incident management;

- Timely and informed decision making based on improved analytical and reporting capabilities across the whole business; and

- Improved customer service and engagement based on advanced customer relationship management across the whole of the business.

2. Document Overview

2.1 Purpose

The Gas Distribution Network Technology Strategy sets the direction and definition for an actionable program of work to meet the business' requirements for the CY2018 – 2022 access arrangement period.

The Technology Strategy has been created to articulate and support the forecast technology capex required to manage the AusNet Services' Gas Distribution Network.

This document:

- Articulates the key areas of focus for technology investment, key risks, programs, costs and service standard outcomes;
- Defines linkages of the Technology 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 Technology Strategy is aligned to the AusNet Services' Asset Management Strategy (AMS) Gas Distribution Network – AMS 30-01, and is supported by the Technology Plan.

The scope of this document is limited to:

- Technology solutions required to support the AMS (including information management, IT applications, and communications technology);
- The GAAR CY2018 – 2022 access arrangement period; and
- AusNet Services' Regulated Gas Distribution business.

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

- All dollar values represent 2017$ Australian dollars;
- All dollar values refer to direct costs only (and will either include or excludes overheads); and
- All forecasted values are based on current project priorities.

2.3   Document Structure

This document is structured as follows:

- **Technology Capex in Context:** This section outlines the context for AusNet Services technology in CY2018 at the start of the control period. **Appendix A: Methodologies and Processes** provides further support to this section defining the key processes and frameworks that underpin the development of the Technology Regulatory proposal.

- **CY2013-17 Historic Capex:** This section provides a high level overview of the projects completed during the CY2013 - 2017 access arrangement period. **Appendix B: Current Period Capex** 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.

- **Forecasting Methodology:** This section identifies technology 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: Technology Strategic Approach** that further outlines business and IT drivers, emerging trends and technologies that inform these technology 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 technology program. **Appendix D: Capital Requirements CY2018 – 2022 – 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 technology expenditure.

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

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

- **Appendix:** The appendix details further information used to support the proposed program.

2.4   Approach

The Technology Strategy is informed by:

- 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 technology environment;
- Opportunities and implications created by trends and emerging technologies;
- Australian Energy Regulator (AER) assessment criteria; and
- Capital and operating expenditure requirements.

AusNet Services performs technology 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.

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

The Technology Strategy is one of a number of asset management related documents developed and published by AusNet Services in relation to its Gas Distribution network. As indicated in the below figure, detailed Plant and Network Strategies (in which the Technology Strategy belongs) inform both the Asset Management Strategy (AMS) and Asset Management Plan (AMP) of the Gas Distribution network.

Figure 3 – AMS Document Interdependencies[1]

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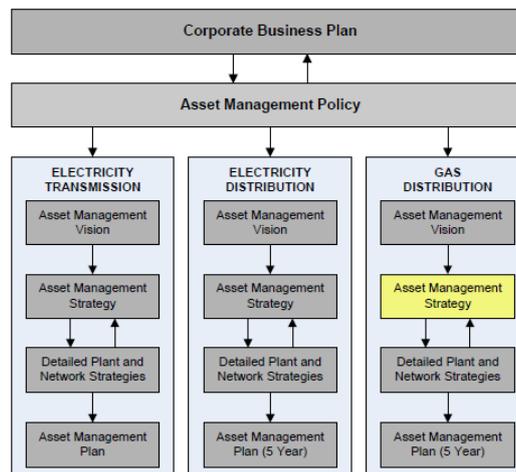
[1] AusNet Services (2013), Asset Management Strategy: Gas Distribution Network AMS 30-01, p.8

3. Technology Capex in Context

3.1 Technology Capex Lifecycle

In any organisation's Technology division, capital investment is driven by two factors, lifecycle management of existing technologies and technology investments to enable the business' strategic direction.

During the CY2013 - 2017 access arrangement period, AusNet Services technology capex was focused on modernising and enhancing core capabilities as well as delivering high priority lifecycle management projects. AusNet Services Technology division is forecast to spend $58.20m against an AER determination of $61.26m (2017$ including overheads). This represents an underspend of $3.07m or 5% of total spend.

A major program was undertaken in the current regulatory period to standardise the way in which the business is managed and introduce new business tools. This has seen AusNet Services invest technology capex in delivering and implementing an EAM/ERP solution.

The strategic importance of the enterprise foundation EAM/ERP solution to the business has seen the Technology division focus its effort and resources on achieving a successful implementation of this enterprise program. Given this prioritisation, capex in CY2015 is lower than previous years.

For the remainder of the current regulatory period the focus is on extending the EAM\ERP foundation and implementing the high priority recurrent capex projects that were re-prioritised.

The figure below shows a year by year view of AusNet Services' Technology Actual/Estimate capex compared to Regulatory Allowance.

Figure 4 – AusNet Services' Technology Actual/Estimate Capex vs Regulatory Allowance
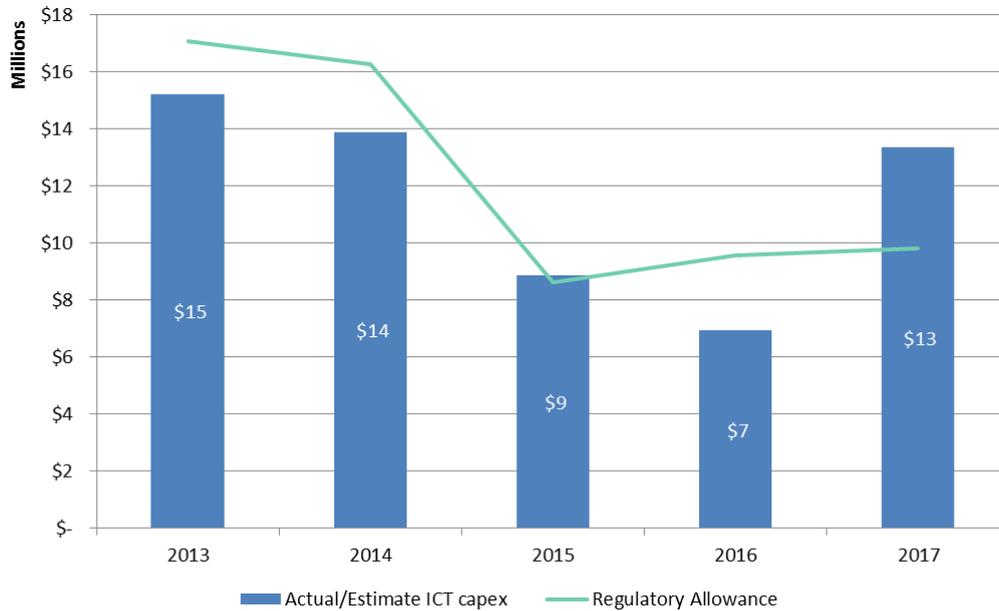
Amounts are Real $Dec '17 including overheads

In conjunction with the EAM/ERP implementation, AusNet Services undertook the following series of technology capex projects during the CY2013 – 2017 access arrangement period:

- Enhancements to network resilience and safety through improved network and outage management;
- Significant investment in the geographical information system (GIS); and
- Lifecycle replacement, rationalisation and consolidation/extension of technology infrastructure.

The key outcome associated with the strategic implementation of the EAM/ERP solution is the ability to modernise and integrate key technology systems. This has enabled AusNet Services to continue to develop a holistic view of the business and develop more effective operational and back office processes. Other key outcomes with these investments include:

- A technology platform that can be scaled to meet the evolving customer, stakeholder and business needs;
- Sustainable operating cost containment through prudent and effective asset management and supporting processes; and
- Maintaining key applications in line with vendor support to mitigate the risk of operational failures.

3.2   Evolution of Technology at AusNet Services

AusNet Services' Technology is evolving in response to the changing needs and requirements of the business as well as changes and trends in the Gas and IT industries.

Prior to the current regulatory period, the focus of the Technology Division was maintaining the disparate legacy IT systems resulting from the prior merger of energy businesses. IT investments at this time were aimed at managing the level of risk, reliability and security required by the business functions.

The initial stages of the AusNet Services' Technology program for the CY2013 – 2017 access arrangement period focused on the implementation of the core EAM/ERP solution. This is the cornerstone investment of AusNet Services' strategic enterprise approach to modernise and transform the IT applications that support the gas distribution business.

For the CY2018 – 2022 access arrangement period, AusNet Services will continue to modernise and consolidate its applications. Forecast investments are also aimed at preparing AusNet Services to evolve in response to the expected business environment post CY2022. The table below shows the transformation of AusNet Services' Technology environment over successive periods.

Table 5 – AusNet Services' Transformation of Technology Environment

	CY2008 – 2012	CY2013 –2017	CY2018 – 2022	CY2023 – 2027
Business environment	Stable and Predictable	Changing	Changing and more complex	Major disruption
AusNet Services 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 • Business deployment of new capabilities • Retire legacy IT environment • Customer enablement	• Full-scale rollout of new IT-enabled business model • Condition-responsive gas network management • Real-time, optimised 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. CY2013 – 2017 Historic Capex

4.1 Actual Capex Against Regulatory Allowance

For the CY2013 – 2017 access arrangement period, AusNet Services' actual (and estimated) capex spend is $58.20m against an AER determination of $61.26m. This represents a forecasted underspend of 5%.

A detailed account of the actual capex spend against AER allocation can be found in **Appendix B: Current Period Capex.**

Table 6 - Actual capex against regulatory allowance

	AER Determination	Actual/Estimate	Variance
Capital Funds *2017$ including overheads*	$61.26M	$58.20M	-$3.07m

The CY2013 – 2017 technology investments enable AusNet Services to increasingly automate and standardise business processes, centralise and integrate information, and provide a sustainable and scalable platform to meet current and strategic business needs. Key projects delivered during the regulatory period are outlined below.

4.1.1 EAM / ERP

The focus of AusNet Services' capital investments was the implementation of the foundational enterprise wide EAM/ERP solution. The purpose of this program was to modernise and simplify the overall technology environment, provide a single source of truth and avoid technology obsolescence. This has enabled AusNet Services to develop advanced capabilities in asset and resource management, business effectiveness and employee and customer engagement. The scope of the foundational EAM/ERP solution focused on the Works and Asset Management and Corporate domains, with specific reference to:

- Enterprise Asset and Works Management;
- Enterprise Project Management;
- Enterprise HR and Payroll;
- Enterprise Financials; and
- Corporate Risk Management.

The foundation phase of the EAM/ERP solution was completed in May 2015. The key outcomes delivered to the AusNet Services business were:

- Consolidation of legacy systems and the standardised use of a core enterprise wide application. This created integrated business processes and foundations to enable operational productivity;

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- Centralised access to real time business data, creating a single source of truth for business information, ensuring greater data integrity and security through advanced user management and access control;
- Enhanced decision making capabilities driven by intelligent data analysis and reporting capabilities across the enterprise;
- A flexible technology platform that can be scaled to meet the evolving customer, stakeholder and business needs;
- Improved employee engagement by simplification and streamlining of business processes and systems to perform tasks;
- Improved experience for customers when interacting with any aspect of the AusNet Services business portfolio; and
- Enhanced monitoring and maintenance of assets to underpin network reliability.

A number of proposed technology initiatives were rationalised as part of the EAM/ERP program, allowing AusNet Services to minimise overlaps and duplication of effort across the portfolio.

The EAM/ERP solution consolidated and delivered business objectives from a number of individual projects, allowing AusNet Services to reduce the dependency on disparate legacy systems, standardise key operational processes and introduce new tools to support business capabilities. The list of rationalised projects that now form part of the EAM/ERP solution is shown below, aligned to the new domain functions.

Table 7 - AusNet Services EAM/ERP Rationalised Projects

Domain	Project Name
Works and Asset Management	[C-I-C]
Information Management	
Corporate	
Information Technology	

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In the CY2018 – 2022 access arrangement period, investments in the EAM/ERP program will focus on extending the functionality and scope of the current solution. Key areas being, regulatory reporting, risk management and digital platforms as well as improving employee management capabilities, and enhancing field mobility capabilities to improve customer response and safety resulting in better collaboration with field engineers.

4.1.2   Other Key Technology Capex Programs/Projects

Whilst the EAM/ERP program was a significant capex undertaking, AusNet Services also delivered the following high priority initiatives:

- Enhancements to network resilience and safety through improved network and outage management: Ongoing investment has occurred in both the maintenance of existing network management and outage management capabilities;
- Significant investment in the geographical information system (GIS): This lifecycle project conducted at the beginning of the regulatory period, was in line with the Technology Strategy to reduce risk of failure while maintaining vendor support; and
- Lifecycle replacement, rationalisation and consolidation/extension of technology infrastructure: This program of work focused on enabling the ongoing operations of core technology systems and platforms through the replacement of ageing assets and prudent investment to increase the capacity of existing infrastructure.

Moving forward, AusNet Services will continue to leverage the investments made in core technology capabilities to meet existing and future customer needs, and regulatory and other stakeholder obligations.

For further information on programs delivered as part of the current regulatory period, please refer to **Appendix B: Current Period Capex.**

5. Industry Benchmarking

The below graph shows Technology related Totex costs per customer for the AusNet Services Gas Distribution Network (blue line).

Compared with the utilities industry benchmark prepared by KPMG in December 2015, it shows that AusNet Services Technology costs are low when compared against the industry mean.

Over CY09-20 AusNet Services' average Technology Totex cost of $29 per customer was half the industry average of $57 per customer.

This highlights AusNet Services' efficient and prudent practices in delivering technology related projects and solutions.
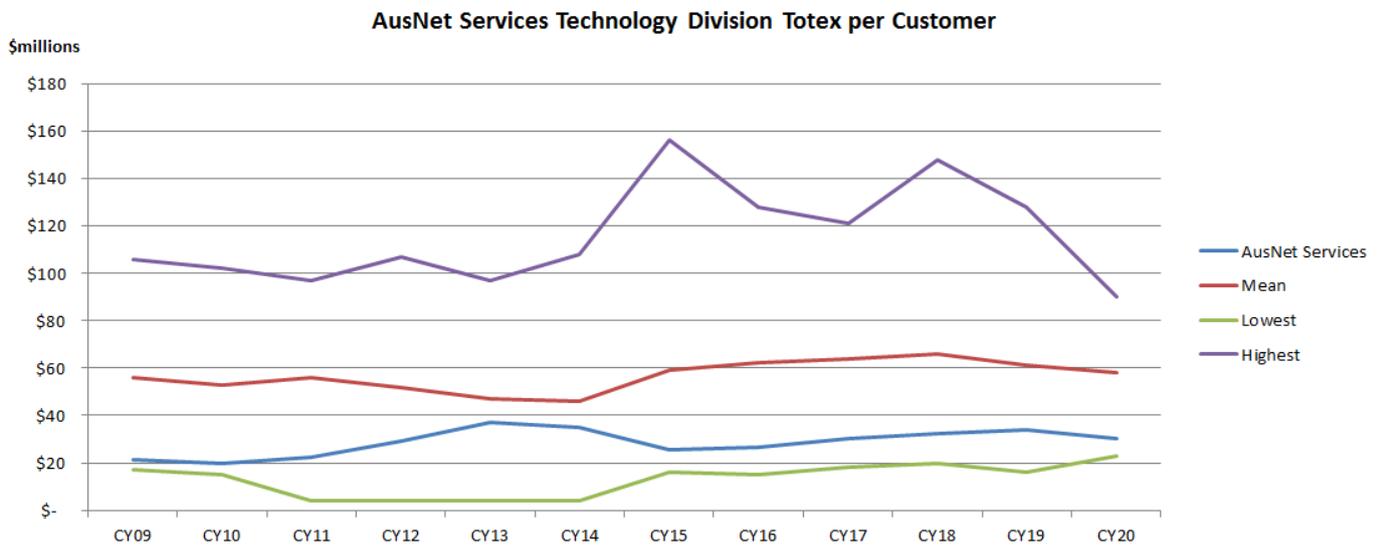
Source: KPMG report 8th December 2015 - GAS Network Information Technology Cost Benchmarking

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 IT services.

6. Forecasting Methodology

AusNet Services uses a three-stage delivery model for technology across all its business activities, the first stage of which is the creation of a Technology Master Plan, followed by Program Execution and System Roll out. The allocation of costs in this Plan to the regulated gas distribution business is the basis of the technology forecast for the GAAR.

6.1 Approach and Process

The figure below shows the five stages in the development of the Technology Master Plan on which the GAAR budgets are based.

Figure 8 – Development of Technology Master Plan

7. Business Need

Requirements for technology are derived from an analysis of the strategic drivers on the AusNet Services' business and their implications for risk management. In partnership with the wider AusNet Services business, technology develop a comprehensive list of requirements and define the internal and external drivers that influence the future direction of the organisation.

7.1 Objectives

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

These objectives are:

- Maintain network safety in accordance with the gas safety case;
- Maintain top quartile operating efficiency;
- Undertake prudent and sustainable network investment; and
- Deliver valued services to our customers.

These objectives are in line with the National Gas Rules (NGR) which is to:

"promote efficient investment in, and efficient operation and use of natural gas services for the long term interest of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas."[2]

7.2 Technology Drivers for AusNet Services

Over the current period AusNet Services has engaged external consultants to identify key trends across the business. The review utilised industry subject matter experts with a view of identifying how the trends impact, and can best be utilised to support AusNet Services' Technology Strategy. This study is supported by a detailed assessment on the implications of trends on AusNet Services, as well as the constraints, risks and the impact of a move from the current to target state of organisational capability. This analysis is ultimately reflected in the initiatives which AusNet Services have elected to proceed with in the upcoming GAAR period. The trends highlighted below relate to the AusNet Services organisation.

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[2] Australian Energy Market Commission, National Gas Rules, http://www.aemc.gov.au/Energy-Rules/National-gas-rules

Figure 9 – Key Trends in the Gas Industry[3]
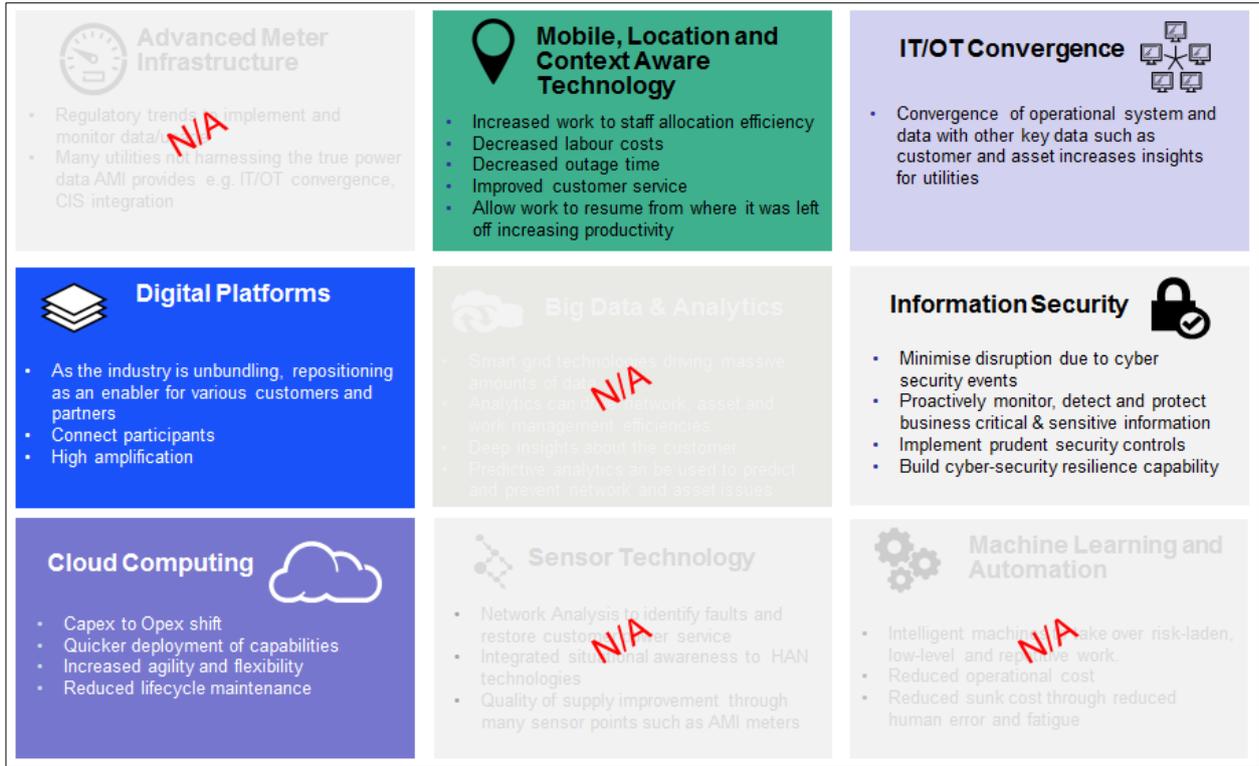
These emerging themes are evaluated alongside existing technologies and practices to identify the most cost effective options for delivering technology solutions to the business at an appropriate level of risk and service.

For further information on strategies that underpin the Technology Strategy please refer to **Appendix C: Technology Strategic Approach**.

7.3   External Drivers, Trends and Implications for AusNet Services

In addition there are external drivers and trends which influence technology functions across the business. The following table details these factors and their implications on technology initiatives at AusNet Services.

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[3] AusNet Services. (2015), *Information Technology Plan FY17: Executive Presentation Overview*, p. 13.

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Table 10 – AusNet Services Technology External Drivers and Trends

External Drivers	Trends	Implications and Outcomes
Customer Behaviour	• Customer expectations are increasing due to higher levels of awareness and access to information. As a result, this adds greater importance on the effective management of two-way customer interactions.	• AusNet Services will establish a centralised single source of truth through the enterprise foundation. • This will enable storage of end customer information and expanded customer engagement by providing access to increasing digital capabilities and real time feedback on the network and customer interactions with it.
Shifts in the external IT landscape	• IT vendors are increasingly moving their business models to Anything As A Service (XaaS) models and offering cloud computing as a preferred option.[4] • This means that AusNet Services must evolve its Technology operating model and in turn its delivery and partnering approaches, to stay current with the external IT landscape.	• AusNet Services will implement its new Technology operating model with a key focus on engagement and collaboration, utilising Partners to augment capacity and capability. Additionally, AusNet Services will execute projects to prepare itself for cloud based computing. • This will enable AusNet Services to have greater agility and flexibility to work with changing IT vendor business models and initiate progressive migration to cloud based services.
Emerging and increasing security risks	[C-I-C]	[C-I-C]

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[4] PWC. (2013), *On The Horizon – Insights into the Cloud for finance and accounting professionals*, p. 2.
http://www.pwc.com/us/en/increasing-it-effectiveness/publications/insights-into-cloud-for-finance.html

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External Drivers	Trends	Implications and Outcomes
	[C-I-C]	[C-I-C]
Demand for new mobility solutions	• There is an increasing focus throughout the technology industry on mobile solutions that provide access anywhere anytime. For AusNet Services such solutions are important because they provide near real time knowledge of the network status as well as improved field workforce management.	• AusNet Services will undertake projects that leverage the EAM/ERP solution by equipping its workforce with mobile devices and the supporting infrastructure.
Maximising value from existing investments and tools	• There is increasing pressure to consistently provide more outputs with less resources, meaning Technology is under constant pressure to maximise the outputs and value of existing investments and to consolidate key systems where feasible.	• AusNet Services will carry out lifecycle management of key systems ensuring that critical network monitoring equipment and interfaces are supported in order to achieve maximum value from them. • This will enable AusNet Services to interface with new technology that will provide increased levels of automation, process simplification, predictive analytics and taking advantage of the foundational investments that have been made, as well as ensuring key systems remain in supported lifecycles.

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External Drivers	Trends	Implications and Outcomes
Increased reliance on asset information and management to control and monitor the network	• There is constant pressure for AusNet Services to provide highly resilient, reliable and quality supply which in turn drives the trend for Technology to provide more timely and accurate management and control of the network through utilisation of asset information.	• AusNet Services will implement its enterprise Information Management strategy and roadmap. The roadmap details improvements to data quality and analytics. • This will enable AusNet Services to respond more quickly to network issues, through more accurate, timely and relevant data. Ensure network reliability and performance by automating network monitoring and responses.

For further information pertaining to the strategic approach driving the Technology Program, please refer to **Appendix C: Technology Strategic Approach.**

8. 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 Processes.**

For the upcoming regulatory period, the impact of changes to the business environment have been assessed using this approach. Summarising the themes identified yields three "Risk Themes" with implications for Technology.

Table 11 – Top Three Technology Risk Themes

Risk	Consequences
Risk Theme 1: Failure to maintain key technology systems at standard lifecycles	Legacy systems that have reached end of life will cease to be supported by vendors. If a system fails, recovery could be lengthy and impact day to day operations. Systems will also become susceptible to security and reliability compromises due to an aged and complex technology landscape. Funding to support the maintenance of an aged and complex IT environment also leads to opportunity costs, as the funds could be better utilised to support other business initiatives.
Risk Theme 2: Increasing digitisation of critical business processes	With digitisation requirements continuing to increase, if AusNet Services is unable to meet the demand, there will be a failure to meet business objectives and core business operations could be impacted.
Risk Theme 3: Inadequate information security impacting business operations	[C-I-C]

9.   Benefits

The AusNet Services Benefits Driver framework enables AusNet Services to identify, assign, and measure the benefits of a particular initiative against the organisation's Technology strategic objectives. It allows AusNet Services to identify which value drivers apply to the initiative, quantify their contribution and ensure their alignment, forming the basis for ongoing measurement and assessment and assurance that the identified benefits are achieved.

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

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

Figure 12 – Benefits of Technology Capex Plan (CY2018–2022)[5]

INDICATIVE BENEFITS		ICT Strategic Initiatives				
		Customer Enablement	Leverage Core	Information Enablement	Communications Enablement	Security Enablement
Improved growth and earnings	Increased growth and diversity of business	✓	✓	✓	✓	
Improved customer satisfaction and brand recognition	Increased customer satisfaction	✓	✓	✓		
	Reduced customer complaints	✓	✓	✓		
Improved operational efficiency	Improved productivity	✓	✓	✓		
	Enhanced decision making	✓	✓	✓		
	Reduced time on process	✓	✓			
Improved workforce and public safety	Reduced number of safety incidents	✓	✓	✓		
	Improved employee retention		✓			
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		✓	✓		

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[5] AusNet Services (2015), *Information Technology Plan FY17 Executive Presentation Overview*, p. 11.

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10. Gap Analysis

The Technology division has undertaken a large body of work within the CY2013 – CY2017 access arrangement period. The implementation of an enterprise wide EAM / ERP solution, in conjunction with other supporting programs of work, has enabled AusNet Services to have a more integrated and efficient technology landscape and associated business processes. As AusNet Services progresses to the future regulatory period the focus will be on meeting the evolving internal business and external stakeholder requirements by expanding the footprint of the SAP platform, and investing in technology that allows AusNet Services to more effectively monitor and manage the network.

Table 13 – 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	• Enterprise approach to information management, reporting and analytics to drive value from core platforms • Additional functionality added to EAM/ERP solution and process commenced to embed platform into the organisation • Implementation of enhanced network security monitoring systems to support secure system access and mitigate malicious cyber activity • Enhanced network management capability through the introduction of increased automation and predictive network analytics
Infrastructure	• Retirement of legacy infrastructure • Deliberate ageing of infrastructure assets to extend lives and free up Technology organisation capacity to deliver projects • Formal service management infrastructure established and operational • Formal lifecycle management policies in place	• Lifecycle refresh of the corporate network infrastructure • Prudent maintenance of data centres and investment in cloud storage • Augment Security capabilities to mitigate new threats • Building Infrastructure as Service capabilities (IaaS) to scale as and when required
Applications	• Core enterprise application frameworks established for project management, reporting, email, content management and customer information systems. • Planning for enterprise solutions for information management and analytics	• EAM / ERP extended to include additional functional areas (e.g. e-GRC and BPC, and employee management) • Leveraging the enterprise mobility platform to support field operations • Supplementary enterprise capability tools deployed for information analytics and decision

	Current State	Future State
		support • Implementation of enhanced network security monitoring and access management

10.1   Current State

Throughout the course of the previous period AusNet Services recognised the increasingly critical and changing role of Technology in an evolving environment, characterised by uncertainty and complexity. Specifically, the business was increasingly reliant on technology 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); and
- Maintainable in an opex and capex constrained environment.

The current technology environment is the result of a strategic response to support these outcomes effectively and prudently 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 Enterprise Asset Management / Enterprise Resource Planning (EAM/ERP) solution to establish commonality; mitigate obsolescence; generate economies of scale across the three networks; and create an overall capability uplift in Technology and across AusNet Services.

AusNet Services also invest in other technology required to enable the enterprise foundation including:

- Enhancements to the geographical information system (GIS), enterprise integration platform and enterprise content management system; and
- Refresh of data centres and supporting IT infrastructure and operations.

All non-core and dependent investments were re-prioritised due to the enterprise foundation investment to optimise capital spend during the period.

More detailed information supporting AusNet Services' current state Technology environment is further described in **Appendix B: Current Period CAPEX.**

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;
- Manual processes to leverage data that exists in operational and external systems;
- Degrading mobile solutions in each business function;
- Duplicated data warehouse platforms; and
- 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; and
- Limited security threat intelligence.

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

Table 14 – AusNet Services Technology 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 technology 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[6]. • 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.

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

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Internal Drivers	Trends	Implications and Outcomes
		• 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.
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 technology 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.

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Internal Drivers	Trends	Implications and Outcomes
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.
Enterprise Approach	• Technology and ERP systems in particular are increasingly used as tools to optimise end-to-end processes across an organisation. • 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 build 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. • Avoid increased operating costs through more efficient and effective asset management and supporting processes. • Support changes created by Data Quality and Analytics and Reporting drivers mentioned above by improving information management and subsequent data quality.

Internal Drivers	Trends	Implications and Outcomes
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.	• AusNet Services will build on security capabilities to protect the 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.

10.2   Future State

Within AusNet Services the role of the Technology business unit is to support the broader business by efficiently delivering cost effective technology solutions that enable achievement of the CY2018 – 2022 access arrangement period objectives; to leverage, extend and improve the enterprise foundation to realise benefits and deliver value for customers.

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;
- Improve information and data management;
- Enhance security measures, controls and threat mitigation actions; and
- Improve enterprise capabilities in line with prudent investment decisions.

This will allow Technology to:

- Support the achievement of corporate, business, technology, network and asset strategies;
- Simplify the IT landscape by consolidating systems into the EAM/ERP solution, creating a single source of truth and end to end process view;
- 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.

11.   Plan Formation and Program Definition

The gap between current and future state technology defines project requirements for the period.

AusNet Services policy for technology 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 upcoming period.

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

11.1   Assessment and Review

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

11.2   Costing Methodology

The Technology Strategy is 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 Technology 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 Technology strategic objectives and needs of the business, and endorsing the most appropriate solution to enable those objectives.

The Technology capex forecast was determined from a bottom up costing of individual projects. The cost of these projects were estimated based on a detailed cost model developed by Ernst and Young (EY) which covers costs for Planning & Scoping, Design, Build, Test and Deploy. These estimates were then tested by AusNet Services' subject matter experts who have experience in delivering projects and understand historical costs and AusNet Services' contexts. 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 Technology capex forecast in this Technology Strategy is developed from P50 cost estimates (exclude contingency/risk factors) and are in direct terms (exclude corporate overheads and escalation).

12.   Forecast

AusNet Services is forecasting IT capex of $60.27m (2017$ including overheads) for the CY2018 – 2022 access arrangement period. The overall Technology capital requirements will be 4% higher compared to actual expenditure in the current period.

12.1   Focus of Investment

The current period spending has focused on implementing the foundational capability and the next period will concentrate on embedding the technology, to leverage, extend and improve the enterprise foundation of the business. Another key focus in the forecast period will be on delivering the remaining core elements of the enterprise strategy through seven inter-related programs. The graph below shows the annual actual/estimated (current period) and forecast (next period) of Technology capex. Annual Technology capital expenditure is proposed to remain relatively high in the initial phase whilst asset lifecycle maintenance is completed before decreasing to more regular capex expenditure towards the later part of the period. This is due to the re-prioritisation of the Technology portfolio to implement and extend the core capabilities of the EAM/ERP solution.

Figure 15 – Actual/Estimated and Forecast Technology Capex
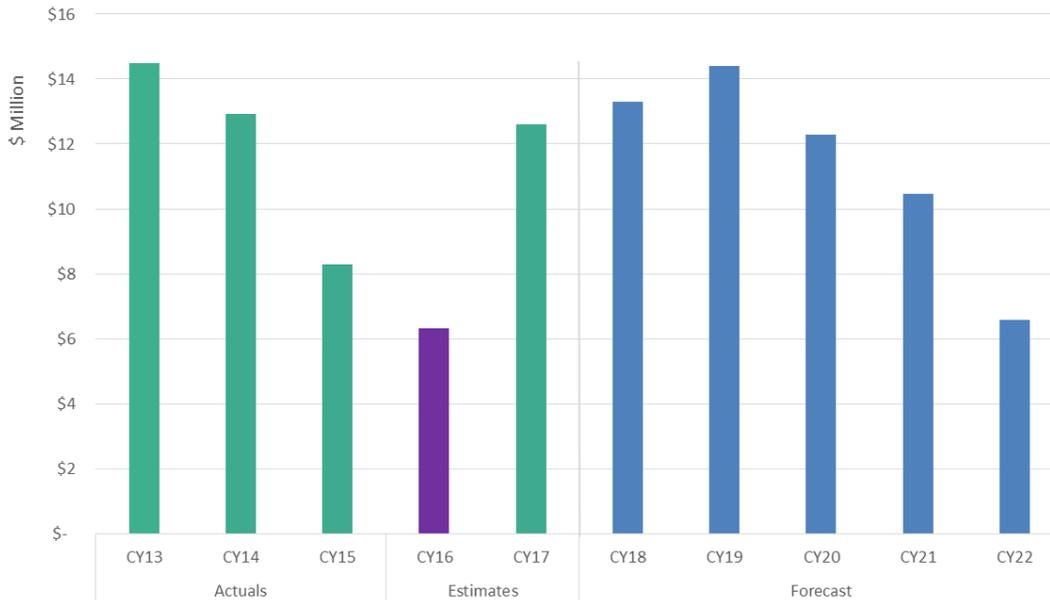
Amounts are 2017$ direct (excluding overheads)

Figure 16 – Distribution of Technology Capex by Program of Work (CY2018-2022)
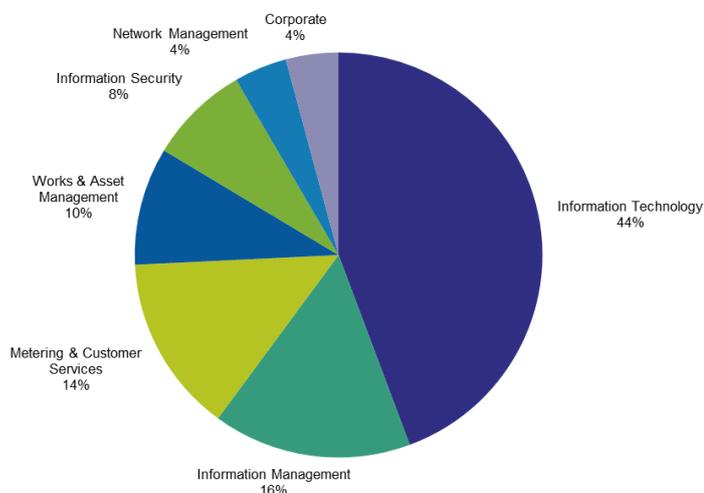
Amounts are 2017$ direct (excluding overheads)

The majority of Technology capital spend in the next regulatory period is within the Information Technology, Information Management and Metering & Customer Services domains. Each of these domains is integral to gathering accurate and timely information on the network and asset performance and using this data to drive intelligent decision making. This ultimately results in more efficient management of the network that limits down time whilst maximising the utilisation of assets and resources.

The table below breaks programs down into annual expenditure.

Table 17 – Annual Technology Forecast Capex

Domains	2018	2019	2020	2021	2022	Total
Information Technology	$6.93M	$6.03M	$3.97M	$5.26M	$3.09M	**$25.27M**
Information Management	$1.31M	$2.66M	$1.61M	$1.70M	$1.70M	**$8.99M**
Metering & Customer Services	$1.15M	$2.77M	$2.37M	$1.39M	$0.40M	**$8.07M**
Works & Asset Management	$0.21M	$0.77M	$2.72M	$0.69M	$0.97M	**$5.36M**
Information Security	$0.85M	$0.73M	$1.39M	$1.28M	$0.29M	**$4.55M**
Network Management	$1.81M	$0.57M	$0.00M	$0.00M	$0.02M	**$2.40M**
Corporate	$1.04M	$0.87M	$0.23M	$0.13M	$0.11M	**$2.38M**
Total excluding overheads	**$13.29M**	**$14.39M**	**$12.30M**	**$10.46M**	**$6.58M**	**$57.03M**
Total including overheads	**$14.00M**	**$15.10M**	**$12.90M**	**$10.98M**	**$7.29M**	**$60.27M**

Amounts are $Dec '17 direct

AusNet Services will leverage, extend and improve on the enterprise foundation. The focus 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.

The below figure depicts how the Technology capability required to support the gas distribution business will be developed incrementally during CY2018 – 2022.

Figure 18 – Technology Business Capability Development Roadmap[7]
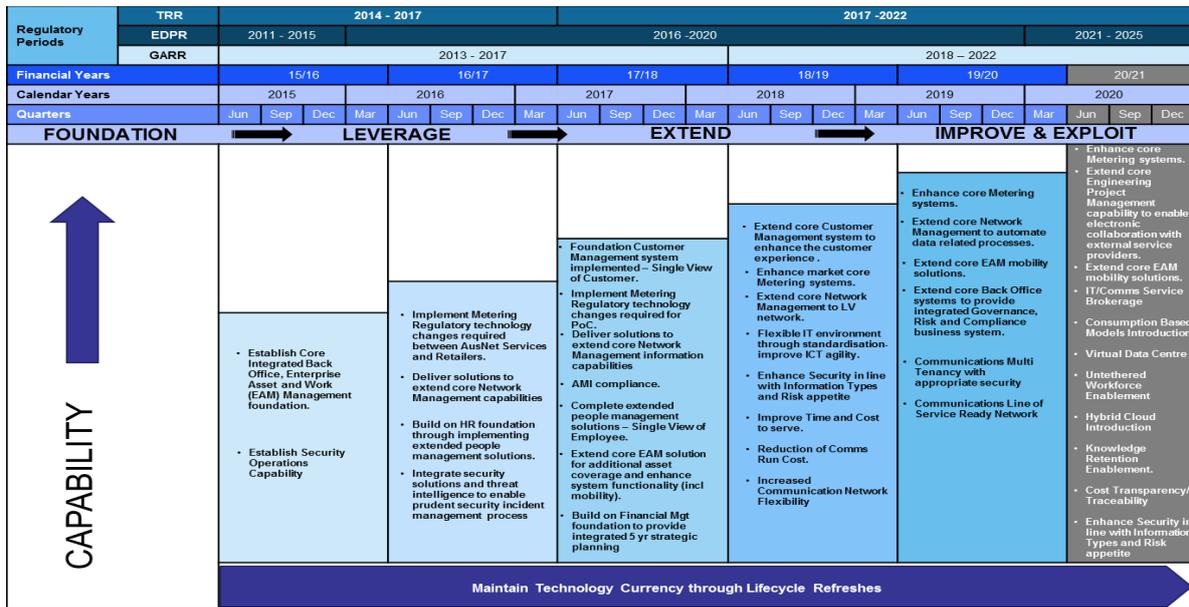
The Technology Strategy is focused on enabling business capabilities at prudent cost.

12.2   Focus of Investment by Domain

The following seven focus areas represent the technology investments and maintenance areas necessary over the CY2018 – 2022 access arrangement period to achieve AusNet Services' enterprise objectives.

- **Network Management** – This domain aims to complete high priority lifecycle management of key network systems in line with the technology lifecycle and vendor roadmaps to support the reliability, safety and security of the gas distribution systems.
- **Information Management** – This domain aims to enable better decision making due to 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.

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[7] AusNet Services. (2015). *Technology Plan Executive Presentation Overview*. p. 7.

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- **Metering and Customer Services** – This domain aims to meet increasing customer demand in communication channel and information access. This will be enabled through prudent IT investments to provide AusNet Services with a centralised system to store end customer information, lifecycle management and consolidation of gas systems and increased digital capabilities.

- **Works and Asset Management** – This domain 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 domain builds on AusNet Services security capabilities that are required to protect the AusNet Services' Technology network, customer and business information in line with the changes and advancement of the network and systems.

- **Corporate** – This domain 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 through implementation of systems, processes and tools to support high performing leadership, capability and culture.

- **Information Technology** – This domain aims to ensure prudent investments to simplify the current technology landscape and key infrastructure including storage, enterprise servers, desktop and laptop fleets and corporate network and communications.

For further details on the proposed Technology program, please refer to **Appendix D: Capital Requirements CY2018 – 2022 – Detailed Program of Work.**

13.   Emerging Industry Trends

During the current regulatory period the focus of AusNet Services' capital investment was the implementation of the enterprise wide EAM/ERP solution. This investment will enable AusNet Services to consolidate legacy technologies, resulting in a simplified overall technology environment through standardised use of one enterprise wide foundational solution.

AusNet Services will continue to simplify the technology landscape by reducing the dependency and associated costs of managing multiple disparate legacy systems. This will be undertaken cognisant of a changing environment in the energy sector, with stakeholders demanding greater agility and flexibility.

Further to these changes increasing visibility of vendor technology roadmaps demonstrate that service based cloud solutions are becoming predominant in key capability areas such as customer, digital and infrastructure; core areas that underpin the AusNet Services' Technology Strategy. This is due to the agility, scalability, collaboration efficiency and flexibility offered by cloud solutions. As a result, IT vendors are increasingly moving their business models to "Anything as a Service" (XaaS), offering cloud computing as a preferred option. Examples include Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). This trend may result in a shift away from traditional asset owned solutions in the future.

With cloud services approaching maturity, AusNet Services will be evaluating the viability of these services to achieve the desired business outcomes when it is prudent and efficient to do so.

For further details on the AusNet Services partnering approach please refer to **Appendix A: Methodologies and Processes**.

14. Delivery

AusNet Services' three-stage delivery model will ensure cost-effectiveness at every stage of delivery to realise the benefits of its investments. The AusNet Services' delivery model incorporating the Technology Master Plan, Program Execution and System Roll Out is shown in the figure below.

Figure 19 – AusNet Services' Technology Delivery Model
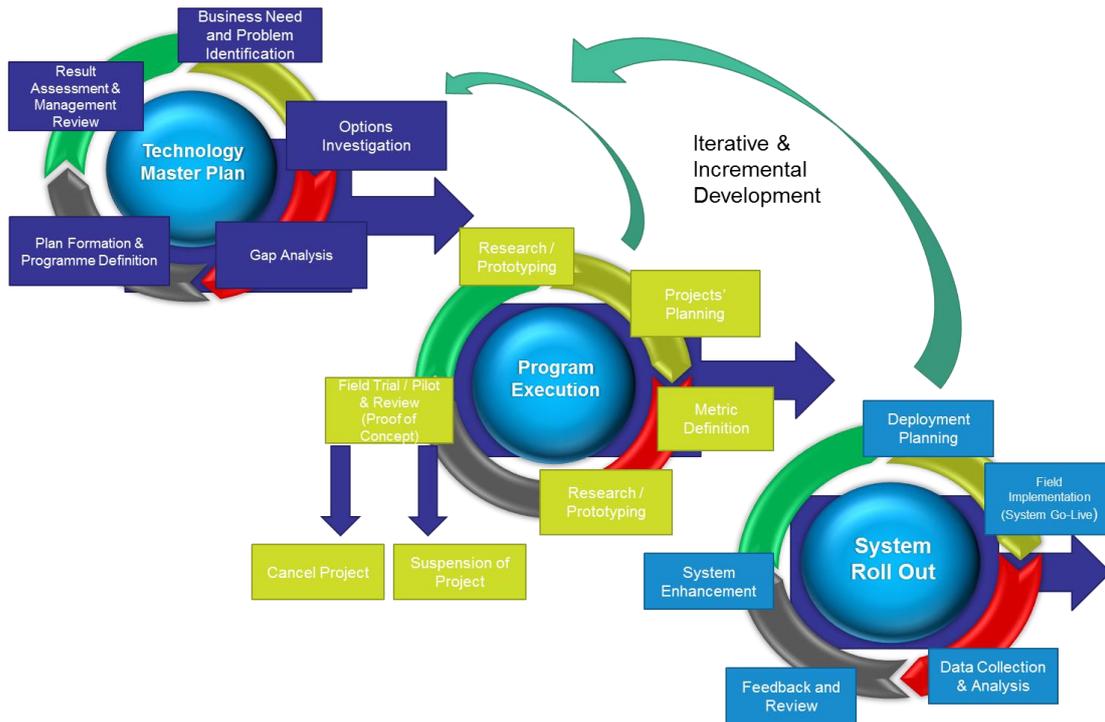
The delivery phase will be driven by strategic priorities, targeted objectives and prudency. All investments have been evaluated to ensure that the minimum cost has been obtained to achieve the targeted benefit for individual components, and that the lifetime cost of operation does not exceed the benefits that are to be realised.

Furthermore, a detailed options analysis has been completed for each project within the planned program of work. 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 Technology program, please refer to **Appendix D: Capital Requirements CY2018 – 2022 – Detailed Program of Work.**

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15   Glossary

Term	Definition
ABC	**A**ctivity **B**ased **C**osts
ACS	**A**lternative **C**ontrol **S**ervices
AEMO	**A**ustralian **E**nergy **M**arket **O**perator
AER	**A**ustralian **E**nergy **R**egulatory
AMI	**A**dvanced **M**etering **I**nfrastructure
AMP	**A**sset **M**anagement **P**lan
AMS	**A**sset **Ma**nagement **S**trategy
BAU	**B**usiness **A**s **U**sual
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
CY	**C**alendar **Y**ear
DC	**D**irect **C**urrent
EAM	**E**nterprise **A**sset **M**anagement
EPM	**E**nterprise **P**roject **M**anagement
EB Services	**E**nterprise **B**usiness **Services** (Australia) Pty Ltd
EDW	**E**nterprise **D**ata **W**arehouse
ERP	**E**nterpris**e** **R**esource **P**lanning
ETL	**E**xtract **T**ransform **L**oad
GAAR	**G**as **A**ccess **A**rrangement **R**eview
GIS	**G**eographical **I**nformation **S**ystem
GRC	**G**overnance, **R**isk and **C**ompliance
HR	**H**uman **R**esources
IaaS	**I**nfrastructure **as a S**ervice
ICT	**I**nformation **C**ommunications **T**echnology
IDAM	**I**dentity **and A**ccess **M**anagement
IP	**I**nternet **P**rotocol
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 energy 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

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Term	Definition
	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.
NGR	**N**ational **G**as **R**ules
OPEX	**O**perational **E**xpenditure
O/S	**O**perating **S**ystem
OSS	**O**perational **S**upport **S**ystems
PaaS	**P**latform **as a S**ervice
SAN	**S**torage **A**rea **N**etwork
SCADA	**S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition
SLA	**S**ervice **L**evel **A**greement
SMF	**S**ervice **M**anagement **F**ramework
SOE	**S**tandard **O**perating **E**nvironment
SaaS	**S**oftware **as a S**ervice
SQL	**S**tructured **Q**uery **L**anguage
VoIP	**V**oice **o**ver **I**nternet **P**rotocol
WAN	**W**ide **A**rea **N**etwork
WLAN	**W**ireless **L**ocal **A**rea **N**etwork
XaaS	Anything as a Service

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Appendix A: Methodologies and Processes

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

- Program Delivery Planning;
- Project Management Methodology;
- Enterprise Project Management Office;
- Staged Funding of Major Projects and Forecasting Methodology;
- Project Delivery;
- Cost Allocation Methodology;
- Operational Service Delivery;
- Risk Management; and
- Technology 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 Technology function.

Program Delivery Planning

In planning to deliver successful Technology 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 Technology 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; and
- 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 GAAR program development 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' new Technology operating model is to build engagement and enhance value through a lean, reliable and disciplined operation which leverages AusNet Services' partners where required.

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

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

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

Figure 20 – Proposed Yearly Capex by Cost Type
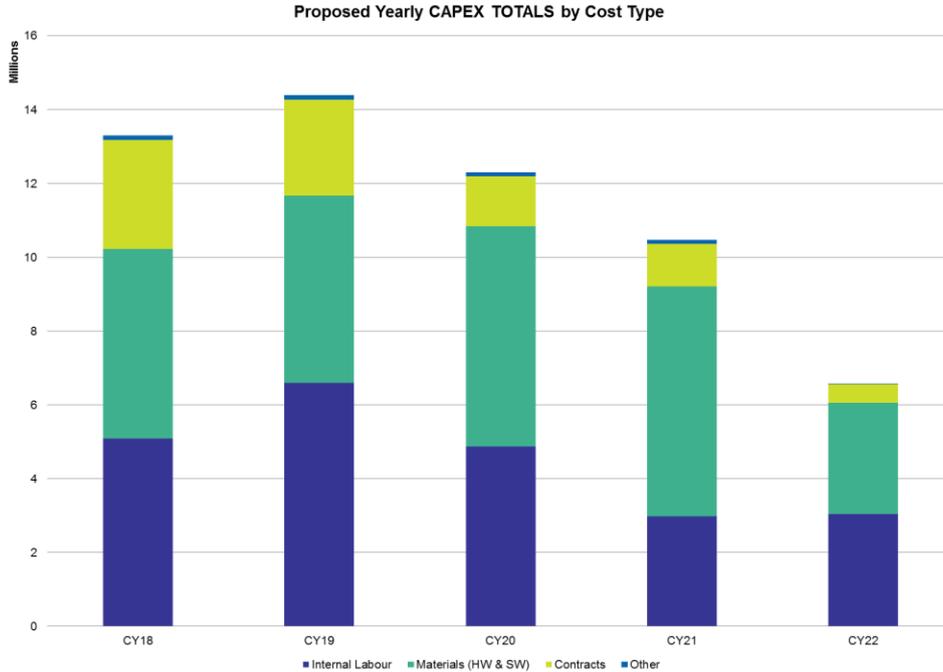
Amounts are 2017$ direct (excluding overheads)

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 takes a program level view of project analysis to ensure that the program is not exposed to risk by attempting to undertake too many concurrent projects and/or too many projects with high value or risk.

Figure 21 – Proposed Yearly Capex by Domain
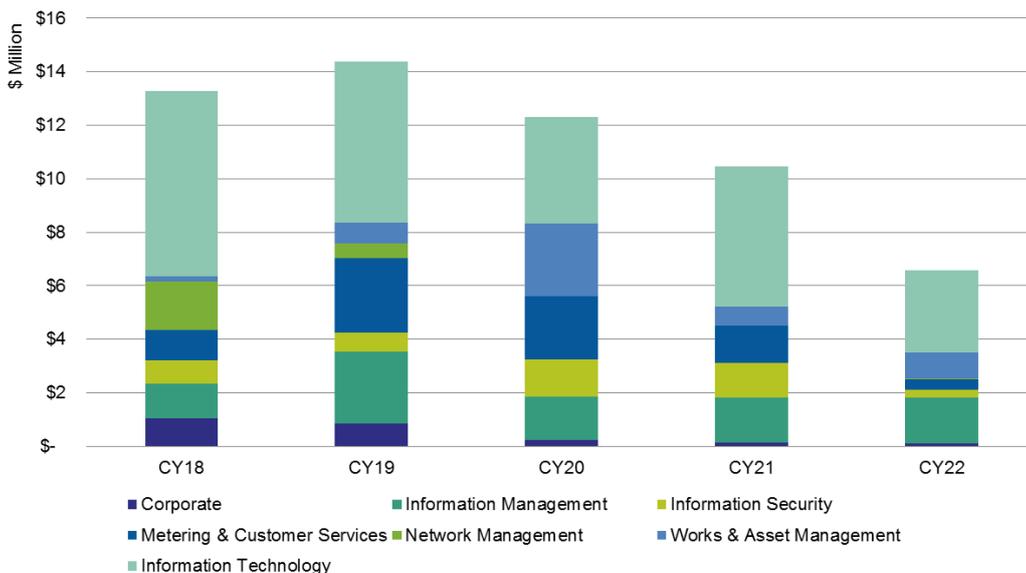
Amounts are 2017$ direct (excluding overheads)

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The final consideration in the program planning is the ability of the business to not only accept the changes delivered by the Technology program but to be in a position to effectively embed enhanced processes and systems to ultimately deliver sustainable 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, such as:

- 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; and
- Case for ongoing commitment to change.

Project Management Methodology

During the course of the 2013 – 17 access arrangement period AusNet Services concentrated on reviewing and consolidating project management methodologies and processes through the formation of an enterprise wide Project Management Office (EPMO).

All AusNet Services' capital projects follow a centralised Portfolio Framework which contains a simple four phased lifecycle approach and is governed by six gates, as per the figure below.

Figure 22 – AusNet Services Portfolio Framework[8]

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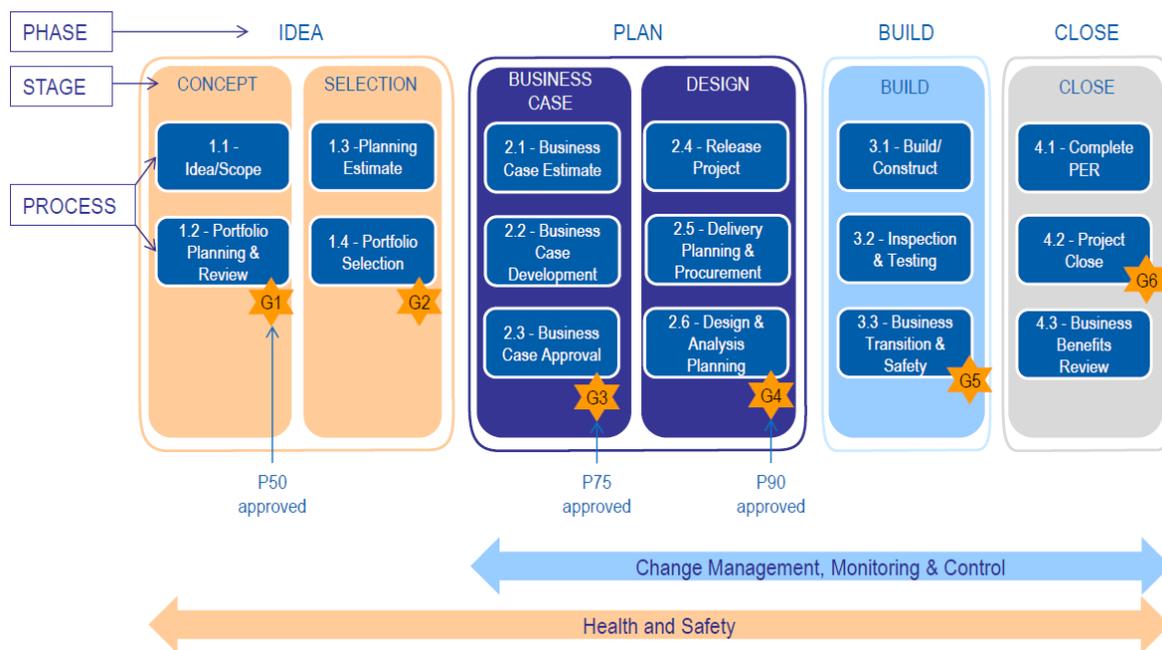
[8] AusNet Services, "Framework and Processes" (2016)

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 prudent cost management.

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.

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 program governance compliance and hence ability to deliver to plan.

Forecasting Methodology

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

- Assessed the current performance of IT systems and infrastructure to inform to what extent its 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 prudent to do so;
- Engaged experienced independent sources to provide research and/or cost estimates where appropriate;
- Assessed the risk of preferred options, identifying appropriate mitigation strategies and the resulting residual risk; and
- Completed cost and benefit assessments, incorporating 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.

As part of effective capital optimisation across the business, AusNet Services conducts a capital allocation and prioritisation process that aims to prioritise 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.

Project Delivery

During 2010/2011, a full and comprehensive review was undertaken by AusNet Services to understand its 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 Technology project delivery;
- AusNet Services' Technology Portfolio Management function established with consistent reporting and governance across all work programs;
- Technology delivery flexibility with capacity as required to deliver on strategic and regulatory initiatives; and
- Establishment of a System Integrator panel for Technology project delivery.

In 2012/13, a further review was undertaken to identify a competitive partner 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 partners appropriate to the size of project engagement. AusNet Services' partners provide industry expertise as well as capability, and capacity augmentation.

It was acknowledged that:

- Increasingly, AusNet Services has a growing requirement to mobilise delivery capability in preparation to deliver a Portfolio of Technology change activities;
- In this context, AusNet Services Technology seeks greater leverage of partners/vendors for improved technology capability, capacity and cost outcomes;
- Clarity of partner/vendor responsibility is critical, whereby partners/vendors provide complementary capability delivering seamless technology services through standard processes and tools;
- Improved cost profiles and business value delivered via business innovation using market based technology and predictable delivery performance is required; and
- Partner services that are well governed through rigorous relationship and performance management via a mature commercial framework balancing delivery quality, risk and value dimensions, is key.

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

Table 23 – Partner Panel Aptitude Qualities

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

Gas Distribution Network – Technology Strategy

The outcome of this review process identified the Tier 1 and Tier 2 Partners 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 figure summarises the project delivery model from business initiative, through project design/delivery, and transition to support. The model is based on shared outcomes delivering enhanced business value through a lean, reliable and disciplined operation which better leverages partner capabilities.

Figure 24 – Project Delivery Model

[C-I-C]
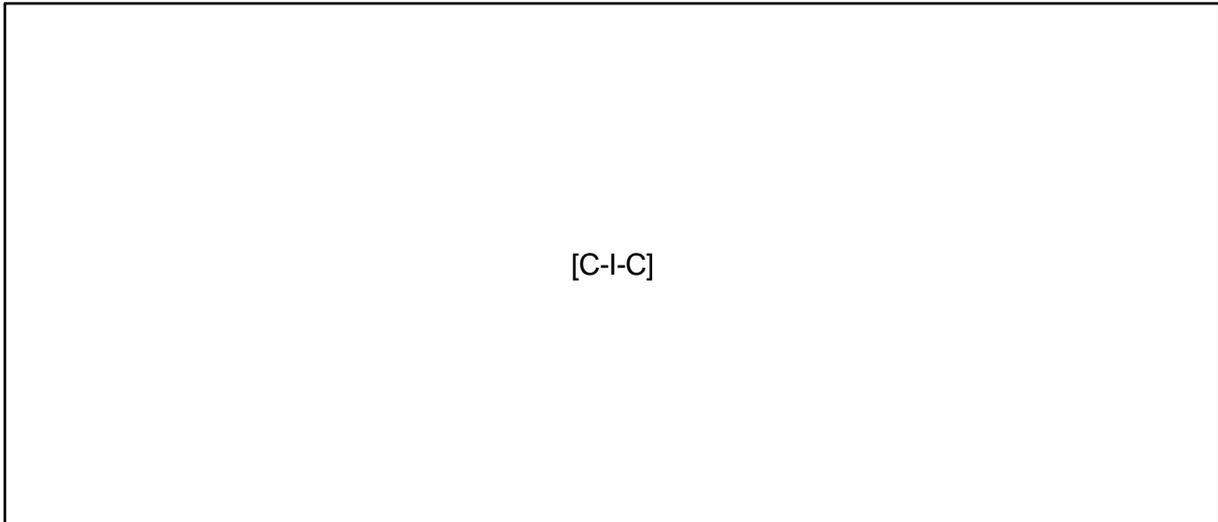
Cost Allocation Methodology

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

The nature of a multi-utility regulated business is the opportunity to leverage shared investments. 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 from having a flexible workforce working across the different networks.

Gas Distribution Network – Technology Strategy

The allocation of IT capital expenditure is as follows:

Table 25 – Technology Expenditure Allocation

Type	Electricity	Gas	Transmission	Total
Electricity Distribution Only	100%	0%	0%	100%
Gas Only	0%	100%	0%	100%
Transmission Only	0%	0%	100%	100%
Distribution Only	70%	30%	0%	100%
Corporate Wide	49%	21%	30%	100%

AusNet Services allocates its forecast Technology 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 critical in a regulatory context to ensure that projects are funded by the customers that will benefit from those expenditures.

AusNet Services undertook a review of the drivers of the program costs to determine the appropriate allocation rules. AusNet Services ensures consistency and integrity of the ABC process by conducting an annual external review of the 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.

Revenue: [C-I-C]

Operating Costs: [C-I-C]

Effort: [C-I-C]

Overheads: AusNet Services adopts one overhead that relates 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 April 2016, 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.

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 26 – Service Management Framework
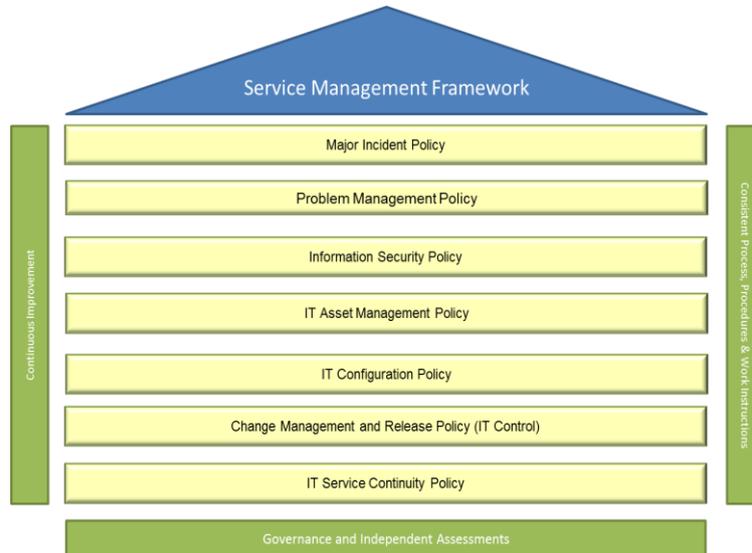
The framework is specific to the needs of AusNet Services and provides a consistent set of processes and tools for managing the delivery of IT services. These have been developed in a manner that supports the AusNet Services business requirements.

The development, agreement and implementation of an SMF for the ongoing delivery of IT services enables and ensures 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;
- Enhanced ability to leverage cloud computing;
- Increase IT support effectiveness;
- Ability to deliver more proactive services;
- Improved reporting;
- Consistent levels of governance;
- 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 technology application and infrastructure, AusNet Services will be able to maintain operational service levels for increased volumes of business activity.

Gas Distribution Network – Technology Strategy

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 empowering communities and their energy future.

A Risk Appetite Statement provides guidance for the execution of strategic and operational activities within AusNet Services. The Risk Appetite Statement describes the amount of risk which AusNet Services is prepared to achieve strategic objectives, and in the ordinary operations of its business. The AusNet Services Risk Appetite Statement is reviewed annually and approved by the Board of Directors, with the most recent approval in July 2016.

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 27 – Risk Management Framework

AusNet Risk Model Based on ISO31000

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 AusNet Services Board at an enterprise level by the Governance 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 below.

Figure 28 – Risk Management Governance Model
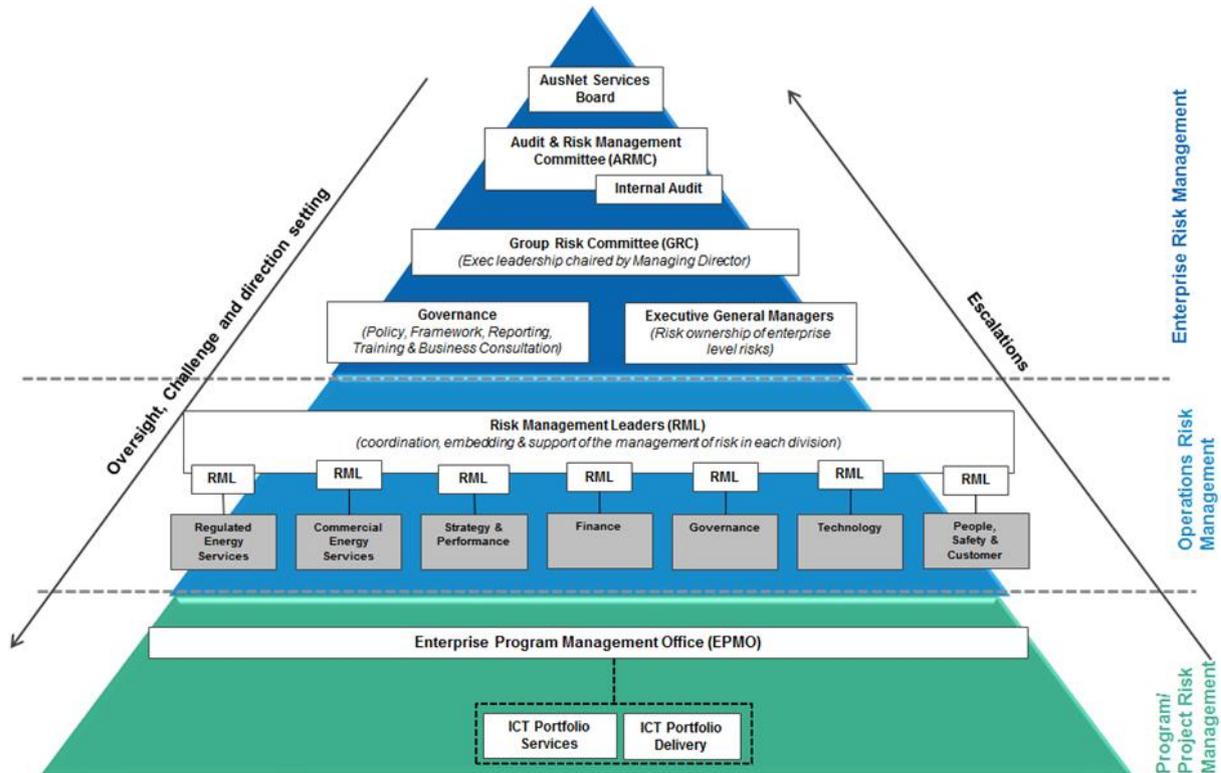
Within Technology, the management of risk is multi-layered. At a divisional level, risks are managed and reported via the Corporate Risk Management System, [C-I-C].

Within [C-I-C], 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; and

- **Operations Risk:** direct impact on Divisional Plan Objectives, or potential to impact or

  potential to have an impact on Business Objectives.

At the Technology Operational level, risks are managed and reported via a Technology Risks and Issues SharePoint register. The risks captured in SharePoint comprise Technology Operations (including Infrastructure, Hardware, Software), Business Systems (including Applications); and Commercial. A Risk Review Forum is conducted fortnightly, where risks are reviewed and potentially escalated to 'emerging' risks in [C-I-C]. Risk is also captured, managed and reported for Technology Portfolio, Program and Projects in SharePoint registers.

Gas Distribution Network – Technology Strategy

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

Figure 29 – Technology Risk Management Framework
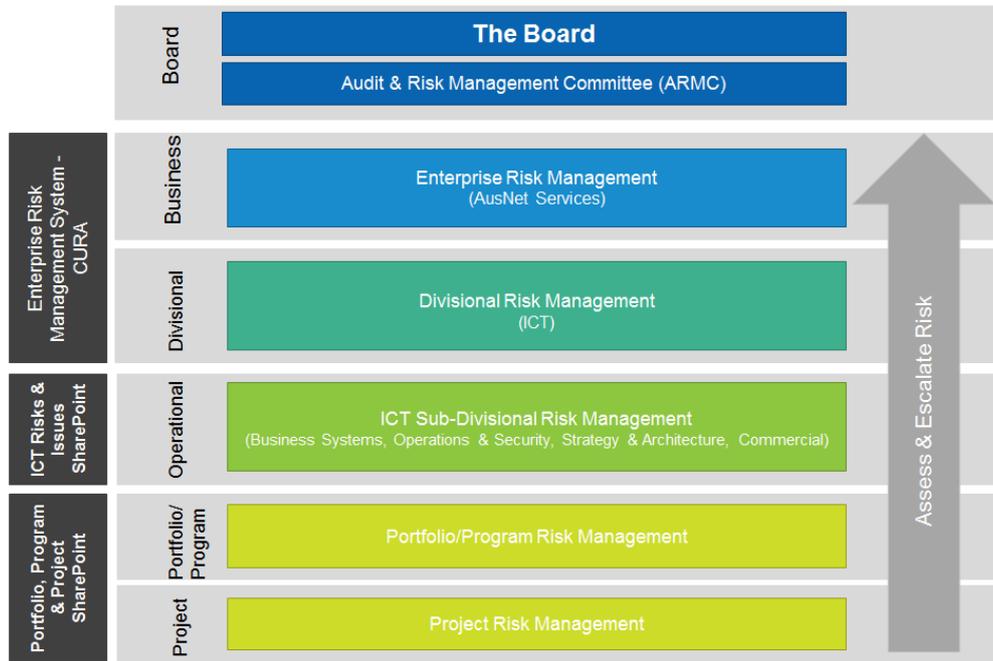
The AusNet Services corporate and divisional risk management frameworks enable proactive management of key business risks to protect and provide acceptable returns on AusNet Services' investments and empower communities and their energy future.

For the Technology Strategy, Divisional Risks are considered. The top three Divisional risks identified through the Corporate Risk Management System are shown in the table below, along with Consequences and Programs of work that address them. These risks are addressed by delivering the programs of work in the Technology Strategy.

Gas Distribution Network – Technology Strategy

Table 30 – Top three Technology risks

Risk	Consequences	Programs of Work and their Domains
Risk 1: Failure to maintain key technology systems at standard lifecycles	Legacy systems that have reached end of life will cease to be supported by vendors. If a system fails, recovery could be lengthy and impact day to day operations. Systems will also become susceptible to security and reliability compromised due to an aged and complex technology landscape. Funding to support the maintenance of an aged and complex IT environment also leads to opportunity costs, as the funds could be better utilised to support other business initiatives.	• Network Management Lifecycle (Network Management) • Enterprise Information and Data Lifecycle (Information Management) • Metering and Customer Services Lifecycle (Metering and Customer Services) • Works and Asset Management Technology Lifecycle (Works and Asset Management) • Corporate Technology Lifecycle (Corporate) • Technology Lifecycle Management – SAP (Corporate) • Data Storage Lifecycle (Information Technology) • Technology Lifecycle Refresh of Other Enablement Technologies (Information Technology) • Lifecycle Refresh of Corporate Network and Comms (Information Technology) • Lifecycle Refresh of Enterprise Server and Standard Operating Environment (Information Technology)
Risk 2: Increasing digitisation of critical business processes	If digitisation requirements continue to increase and AusNet Services is unable to meet the demand, there will be a failure to meet business objectives and core business operations could be impacted.	• Enterprise Data Creation, Storage and Integration (Information Management) • Improve Data Quality (Information Management) • Enhanced Decision Making (Information Management) • Information Management Augmentation (Information Management) • Safety Visibility Management Program (Corporate) • Digital Collaboration Program (Corporate)

Gas Distribution Network – Technology Strategy

Risk	Consequences	Programs of Work and their Domains
Risk 3: Inadequate information security impacting business operations	[C-I-C]	

Technology Operating Model

In 2014 AusNet Services commenced the introduction of a new operating model to prepare Technology for the challenges identified and provide the foundation required to support the transition throughout the next period. The new Technology 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 Technology 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 Technology services".*

The Technology operating model aims to deliver the following key financial and non-financial benefits:

- The right level of resource in the right functions with the right skills across the Technology organisation;
- Address existing gaps in capability, full time employee mix and spend compared to peers and industry standards;
- Support the transition of Technology's cost base to a competitive and sustainable level;
- Develop maturity to support industry and business drivers;
- Ensure that Technology is better aligned to the business and its ongoing requirements;
- Establish a more lean, reliable and disciplined operating model which enhances business value; and
- Ensure single point accountability for dependable fit for purpose Technology services and solutions.

Gas Distribution Network – Technology Strategy

Figure 31 – Technology Future Operating Model[9]

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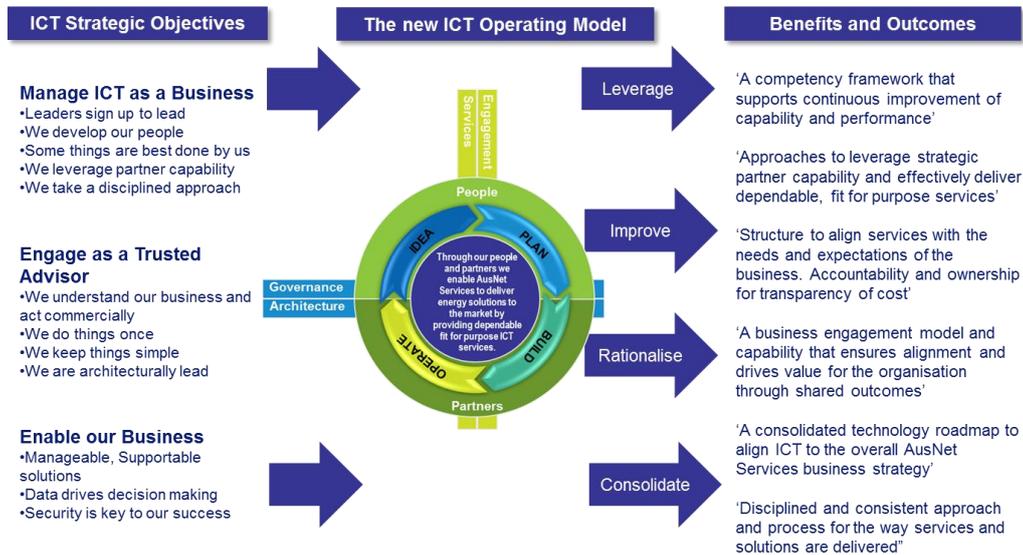
[9] AusNet Services, "ICT Division Business Plan & Technology Plan", Feb 2015. p. 42.

Appendix B: Current Period Capex

Context and Background

In the GAAR CY2013 – 2017 access arrangement period, AusNet Services embarked on a significant change in its approach to technology aimed at modernising and enhancing core technology capabilities. This was based on enterprise wide system capabilities, enhanced data capture and analytics, and accurate network management capabilities. The main programs of work were underpinned by the need for technology investments to integrate traditionally siloed functions. This investment established a technology platform that could support both the current and future needs of the business.

The following key objectives were identified for major investment:

- Provide improved asset management capabilities to schedule and execute work on the network more effectively and safely, driven by real time data. Additionally, focusing spending where there is maximum benefit;
- Enable operating effectiveness through increased process automation and collaboration tools;
- Provide capabilities to better capture, sort, analyse and present large volumes of accurate data for informed decision-making; and
- Modernise and enhance the base of technology assets (through replacement or refresh) to support new network management capabilities underlying the renewed focus for Technology at AusNet Services.

Overall Technology Spend

Table 32 - AusNet Services Technology Spend Vs Actual / Estimated

	AER Determination	Actual/Estimate	Variance
Capex *2017$ including overheads*	$61.26m	$58.20m	- $3.07m

Gas Distribution Network – Technology Strategy

Figure 33 - Capex Spend/Estimate vs AER Allocation
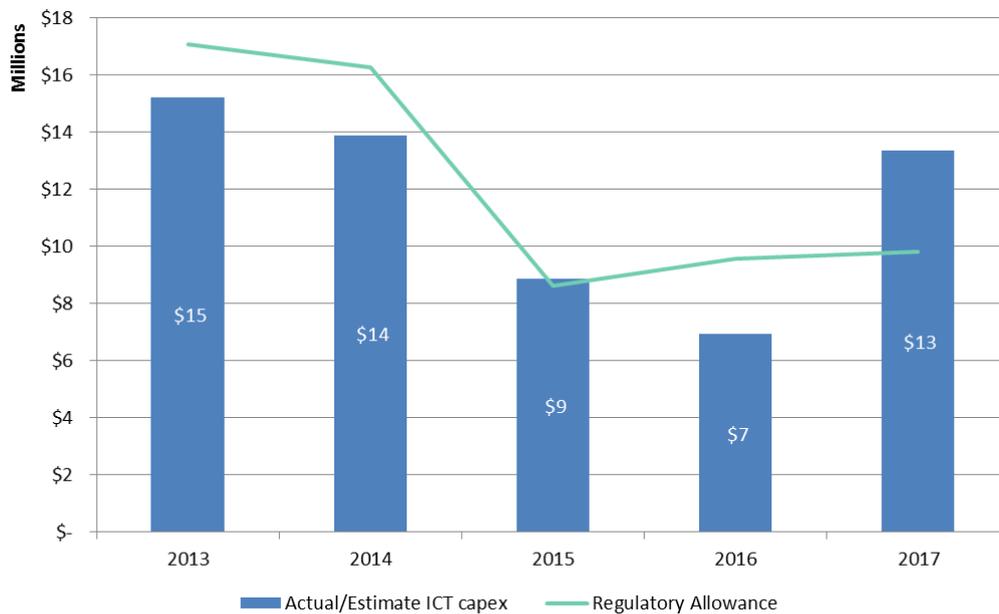
Amounts are 2017$ including overheads

Over the CY2013 – 2017 access arrangement period AusNet Services is scheduled to spend $58.20m against an AER Determination of $61.26m. This represents an underspend of 5%. Key points of note for expenditure within the period are outlined below:

- This period is marked by significant investment in the delivery of the enterprise wide EAM/ERP solution. The EAM/ERP solution was successfully delivered in May 2015 and constitutes a significant proportion of upfront spending in the period.
- In CY2015 Technology capital expenditure was reduced due to a conscious decision by AusNet Services to limit the rate of technology change being placed upon the organisation and concentrate efforts on embedding the EAM/ERP solution.
- A number of mandatory Technology capital expenditure projects have been, and planned to be, undertaken across the portfolio to support real-time network management operations. This includes information security initiatives to improve user authentication and access management, and technology infrastructure refreshes based on technology and business application lifecycles.
- From CY2016, AusNet Services has undertaken a number of initiatives from CY2013 and CY2014. All non-core and dependent investments were re-prioritised to focus on the EAM/ERP implementation. This resulted in changes in the schedule of spending across the CY2013 – 2017 access arrangement period when assessed against the AER determination. More specifically this occurred as a part of the enterprise portal, analytics and reporting initiatives, which were consumed within the scope of the EAM/ERP.

During the CY2013 – 2017 access arrangement period AusNet Services prudently managed its operational and capital spend to allow for flexibility to invest in transformation initiatives (e.g. EAM/ERP). AusNet Services exercised prudency, waiting until the EAM/ERP solution was fully implemented so these projects would receive due diligence of full project scope, complexities and dependencies.

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With a clear understanding of the importance of these projects and the need to minimise risks, AusNet Services implemented multiple minor improvements to ensure operational continuity and support of systems that were in need of a refresh as aligned to the technology lifecycle framework. This enabled AusNet Services to ensure systems are stable and effective, and minimise issues related to performance, stability, support and data quality.

Technology Domains

During the CY2013 – 2017 access arrangement period the scope of Technology capital expenditure was categorised into six domains of work. The focus of investment was on:

- **Asset and Works Management:** Improve safety and maintain network integrity and capacity through the delivery of a new consolidated and integrated enterprise platform to drive efficiencies across end-to-end asset and works management processes.

- **Back Office Management:** Maintain customer service by ensuring back office systems meet the increased volume of business transactions. This will be delivered through the implementation of an integrated enterprise resource planning platform to drive efficiencies across back office functions.

- **Workforce Collaboration:** Improved safety and maintenance of quality customer service through the provision of systems to support effective knowledge management. The workforce collaboration solution will also provide efficient scheduling and dispatching of work.

- **Analytics and Reporting:** Maintain network capacity through the provision of improved analytics and reporting.

- **Network Management:** Improve safety and maintain network integrity and customer service through the delivery of enhanced information, assets, processes and systems to enable effective decision making and management of the gas network.

- **Technology Infrastructure and Operations:** Maintain network integrity by ensuring technology infrastructure is up to date, robust, scalable, and agile to support the changing business needs and ongoing initiatives.

Due to the size and scope of work performed across the CY2013 – 2017 access arrangement period, a number of key Technology initiatives extend across multiple domains (e.g. EAM/ERP). Many initiatives within the period were supported by enhancements to data gathering and utilisation capabilities, underpinning the new enterprise environment. As such the spending profile was adjusted across domains, with a focus on consolidating multiple initiatives and minimising overlaps and duplication of effort across the portfolio.

The analysis of the current period has aligned to the new domain structure, shown in the table below.

For the CY2018 – 2022 access arrangement period, AusNet Services has amended some of the domains to ensure alignment to the wider AusNet Services business.

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The mappings of current to future domains are shown below.

Table 34 - Mapping of Current and Future Domains

Current Domain Name	Future Domain Name
Asset and Works Management	Works and Asset Management
Back Office Management	Corporate
Workforce Collaboration	Metering and Customer Services
Analytics and Reporting	Information Management
Network Management	Network Management
Technology Infrastructure and Operations	Information Technology
	Information Security

The following sections explain the key projects undertaken within each domain, and the financials and outcomes they have or will generate for the AusNet Services gas distribution business.

Corporate (including EAM / ERP)

Table 35 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$[C-I-C]	$[C-I-C]	$[C-I-C]

[C-I-C]

The implementation of the foundational enterprise wide EAM/ERP solution was the most significant Technology capital program in the 2013–17 access arrangement period. As an organisational wide program the scope of the EAM/ERP program spanned a number of AusNet Services domains. The key elements of work are detailed below:

Domain	Project Name
Works and Asset Management	
Information Management	
Corporate	[C-I-C]
Information Technology	

During the 2013-17 access arrangement period spend across the EAM/ERP program was $[C-I-C], which is $[C-I-C] above the AER allowance. The EAM/ERP solution was implemented in May 2015. Whilst the EAM/ERP program was delivered to key milestones and program outcomes the scope of the program was greater than initially forecast. AusNet Services identified the opportunity to refresh and consolidate legacy back-office systems and data, provide enterprise foundations for future process and business process improvements, and included these in the scope of the EAM/ERP program. For example, two projects involving the consolidation of HR and payroll systems, and financials and treasury systems were incorporated into the scope of the program. All of these projects facilitate better utilisation of the EAM/ERP solution, reducing total costs over the aggregated Technology portfolio of work.

Key Outcomes

The following are the key outcomes of implementing the EAM/ERP solution:

- Consolidation of legacy technologies and the standardised use of one enterprise wide application. This created integrated business processes and increased operational productivity;

Gas Distribution Network – Technology Strategy

- Centralised access to real time business data, creating a single source of business information, ensuring greater data integrity and security through advanced user management and access control;
- Enhanced decision making capabilities driven by intelligent data analysis and reporting capabilities across the enterprise;
- A flexible technology platform that can be scaled to meet the evolving customer, stakeholder and business needs;
- Sustainable operating cost containment through more effective asset management and supporting processes;
- Improved employee engagement by simplification and streamlining of business processes and systems to perform daily tasks;
- Improved experience for customers when interacting with any aspect of the AusNet Services business portfolio; and
- Enhanced monitoring and maintenance of assets to underpin network reliability.

Network Management

Table 36 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$5.38m	$6.04m	$0.66m

[C-I-C]
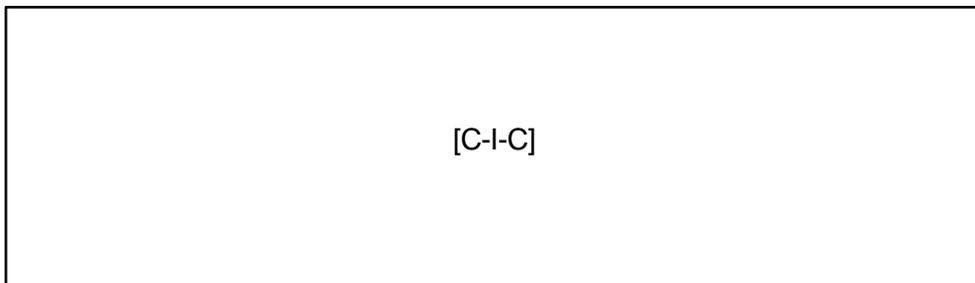
In the 2013-17 access arrangement period the focus of the Network Management domain has been on performing required maintenance and refreshes to existing network management systems, and performing maintenance to the SCADA real time management system. In addition, technology lifecycle refreshes were undertaken on network management assets and systems to ensure continuity of service for control and operations facilities.

AusNet Services will undertake a planned software upgrade of the SCADA network management system. This will minimise the risk of failure, ensuring that systems components remain in vendor support and in line with AusNet Services lifecycle framework.

Investment is planned for the existing outage management system reaching end of life. This system allows AusNet Services to reduce the dependency on manual processes (duplicate data entry) for gas distribution outage planning and management. It will also provide the appropriate reporting capabilities to conform to National Gas Rules and AEMO requirements.

During the current period, spend in the Network Management domain was $0.66m over the AER allowance.

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Key Outcomes

The key outcomes planned / delivered to AusNet Services from the Network Management domain are:

- Ability to maintain the quality, reliability and security of supply;
- Reduced risk of system failure by ensuring the systems are under vendor support through proactive management of the network assets and reduced risk of system failure;
- Demonstration of prudent management of key operational systems and ability to meet AusNet Services' regulatory obligations through the continued provision of fit for purpose communications, monitoring and control facilities;
- Enhanced data analytics to support responses to network outages;
- Enhanced compliance processes through improved timeliness of distribution outage and service performance reporting capabilities;
- Maintained customer satisfaction due to enhanced work allocation and proactive management of the growing network by increasing the number of gas data points on the network;
- Effective management of a key operational system by ensuring the computer hardware and software is maintained under extended warranty provisions at minimal cost; and
- Improved software implementations training practices to support improved testing and training procedures.

Information Technology (Infrastructure)

Table 37 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$16.25m	$12.86m	-$3.39m

[C-I-C]
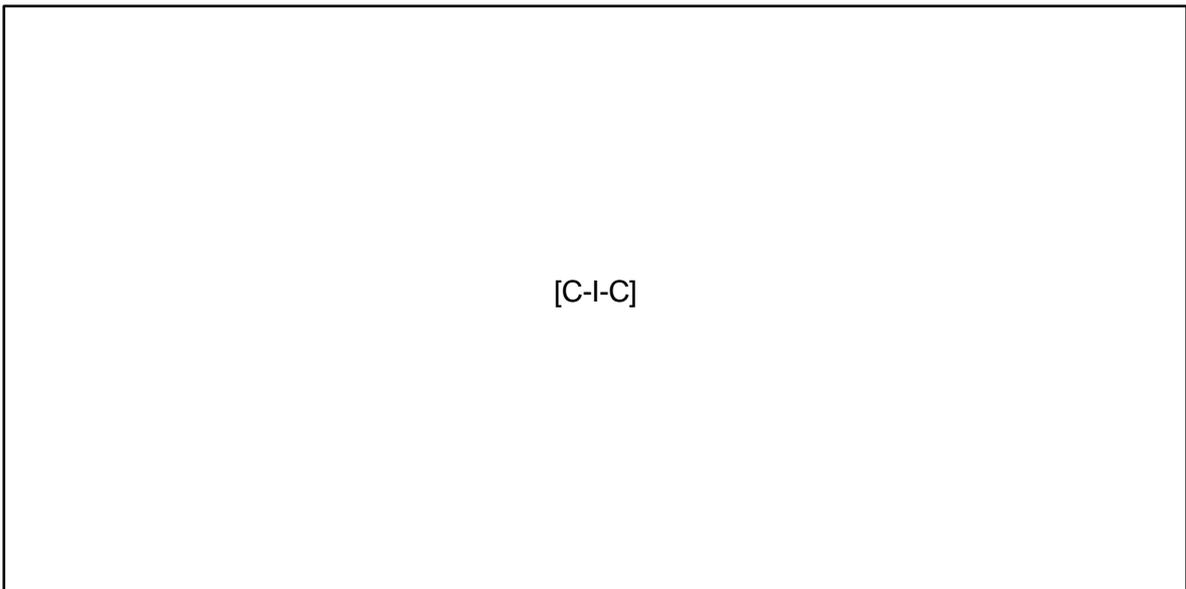
Gas Distribution Network – Technology Strategy

A number of key infrastructure systems will be nearing end of life during the 2013-17 access arrangement period. Therefore, the majority of investments in this period are to ensure the stability and dependability of the Technology infrastructure systems. If lifecycle refreshes are not addressed, AusNet Services could be exposed to operation of unsupported systems or experiencing systems failures representing a critical risk to the supply of gas. AusNet Services successfully completed replacement of the aging storage infrastructure and refreshes for technology servers as well as data centre infrastructure. Virtual server hardware refreshes and desktop standard operating environment (SOE) refreshes are also planned, which will include both a refresh of the standard operating environment and operating systems for identified desktops.

During this regulatory period, spend in the Information Technology (Infrastructure) domain is planned to be $12.86m representing a $3.39m underspend.

Key Outcomes

The following are the key outcomes of implementing the projects in this domain:

- More robust and scalable technology infrastructure environment which supports Technology as a core driver of business value;
- Prudent management of a key operational system to limit the risk of system failure by ensuring the system is up to date and supported by the vendor and as a result increased system reliability;
- Controlled capital expenditure though lifecycle management;
- Provide scalability and flexibility to changing business demands on infrastructure;
- Ability to support the systems needed to maintain the quality and reliability of gas distribution;
- Enhanced information displays in order to aid reactive network management processes;
- Leveraging existing capabilities through enhancements to manage the increased asset base with minimal costs by leveraging existing system functionality; and
- Ensure computer hardware and software is maintained in line with specification and requirements to extend warranty provisions where it is cost effective to do so.

Information Security

Table 38 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$0.88m	$2.01m	$1.13m

[C-I-C]

Gas Distribution Network – Technology Strategy

For the 2013-17 access arrangement period the Information Security initiatives were included as part of the Information Technology domain. Due to the increasing awareness and likelihood of attacks there has been more focus on Information Security and as a result AusNet Services decided to create its own specific work domain. The purpose of Information Security is to mitigate security risks that threaten AusNet Services' business and network assets. The Information Security domain covers four key areas:

- Identity and access management;
- Infrastructure;
- Monitoring; and
- Compliance.

Initiatives within these key areas include the replacement of end of life assets, enhancements to key procedures, improved network security architecture, enhanced governance and overall network security resilience.

In the 2013-17 access arrangement period Technology capital spend in the Information Security domain had a total spend of $2.01m. AusNet Services will undertake a number of information security initiatives including identity and access management, refresh of the enterprise security gateway, enhancement of IT-governance, and risk and compliance capability.

Key Outcomes

The Technology Security domain will deliver the following outcomes for AusNet Services:

- Reduction of operational and financial risk through enhanced user access control;
- Risk reduction of intrusion/cyber-attacks/malware;
- Operational risk reduction through access based on principle of least privilege;
- Network Reliability through increased accountability and non-repudiation; and
- Immediate alerts on intrusions, attacks, spread of malicious software and attempted misuse of authority by authenticated users.

Customer and Metering Services

Table 39 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$3.38m	$1.87m	-$1.51m

[C-I-C]
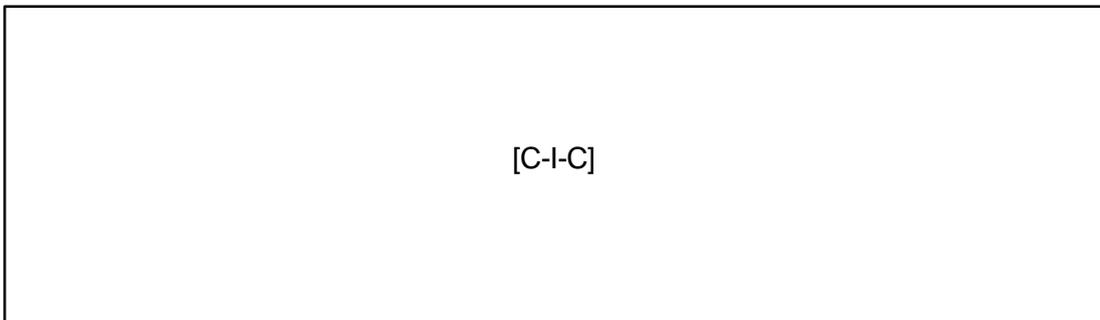
During the 2013-17 access arrangement period spend in the Customer and Metering Services domain was $1.87m. The focus for investment in the Customer and Metering Services domain

Gas Distribution Network – Technology Strategy

has been on delivering the foundation for customer centric projects; re-branding of the corporate website and the upgrading the legacy CIS system.

Through its digital customer enablement strategy AusNet Services has refreshed the corporate website as a mandatory enterprise wide investment associated with the name change from SP AusNet to AusNet Services. It will also refresh the underlying technology platform. Another objective is to improve the user experience reducing stress on the customer call centre as more updated information is accessible via the website.

The CIS system was upgraded to maintain currency in alignment with AusNet Services lifecycle framework. This will result in enhanced customer interactions as it will enable the integration of key customer information and asset data that will improve service order management, planning and scheduling, and inventory management.

Throughout the remainder of the period AusNet Services will focus on completing lifecycle refreshes to key gas metering applications.

Key Outcomes

The key outcomes delivered to AusNet Services from the Customer and Metering domain are:

- Refreshed customer self service offerings via the corporate website;
- Provide a more interactive online experience for customers;
- Maintain customer service levels through improved customer interaction;
- Supporting future customer relationship management capabilities upgrading the CIS system;
- Creating a 'single source of truth' for customer information across the organisation; including the monitoring of customer interaction history;
- Enabling the ability for AusNet Services to automate customer interactions and gather relevant information for improved, more tailored customer service and experience;
- Lifecycle refresh to key gas metering applications in alignment to AusNet Services application framework; and
- Improving corporate branding for AusNet Services.

Information Management

Table 40 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$3.62m	$3.27m	-$0.34m

[C-I-C]
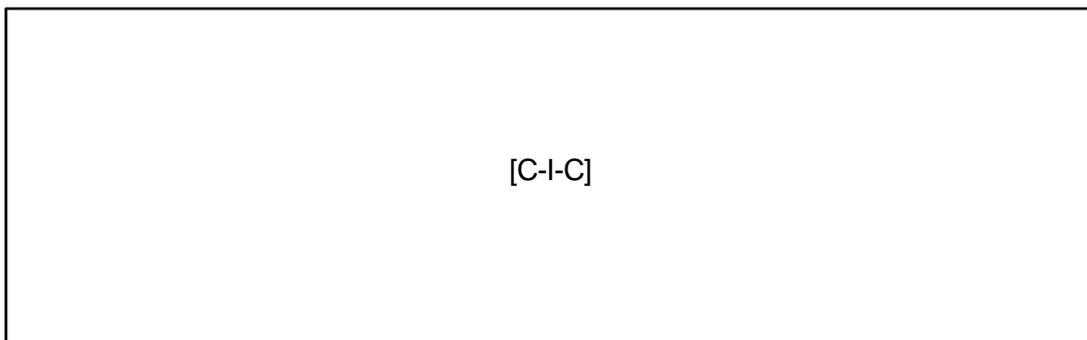
Gas Distribution Network – Technology Strategy

In the current regulatory period the focus of investment in Information Management was on undertaking the rationalisation and/or refresh of systems for data storage, integration and processing. AusNet Services is building an Enterprise Data Warehouse capability that will support integrated enterprise data storage. This will enable AusNet Services to create a central location and permanent storage space for the various data sources needed to support analysis, reporting and other business intelligence functions. AusNet Services proposes to commence the delivery of an enterprise information enablement and analytics capability, through the consolidation of current reporting solutions onto a common platform, and providing the appropriate data presentation tools.

During the 2013-17 access arrangement period spend in the Information Management domain has aligned closely to the AER determination; with a variance under total allowance by $0.34m.

Towards the end of CY2015 AusNet Services determined, based on scope and the benefits to be delivered through the Enterprise Data Warehouse (EDW) project, that it directly benefits the electricity distribution business only. As a result, from January 2016 EDW costs have been allocated 100% to electricity distribution.

AusNet Services is planning to implement the Enterprise Content Management Project within the current regulatory period.

Key Outcomes

The key outcomes planned / delivered to AusNet Services from the Information Management domain are:

- Better organisational agility by leveraging real-time / near real-time analytical data to make better decisions in response to an increasingly variable network environment;
- Better monitoring of network and workforce performance with the ability to report and analyse historical and forecast performance metrics more effectively;
- Better flexibility and capacity to scale in order to meet frequently changing and increasingly complex regulatory and safety compliance reporting requirements;
- More effective forecasting and scaling of activity in response to the projected AMS capacity requirements for customer and asset works; and
- Improved allocation of capital for asset replacement, based on asset condition and reliability centred maintenance, supported by analytical intelligence.

Works and Asset Management

Table 41 - Financial Spend against AER Determination

	AER Determination	Actual/Estimate	Variance
Capex *2017$ excluding overheads*	$1.49m	$1.86m	$0.36m

[C-I-C]

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Over the current period a significant proportion of the Works and Assessment Management Technology capital investment was performed under the scope of the EAM/ERP program.

During the 2013-17 access arrangement period spend in the Works and Asset Management domain, outside the scope of the EAM/ERP program, has a total variance of $0.36m. The refresh of the CAD design solution will be performed.

Commencing in CY2016 is a program of work which is focused on extending the EAM/ERP solution, specifically the mobility component, which will enhance data capture and enable AusNet Services to conduct near real-time data analysis.

Key Outcomes

The following are the key outcomes of implementing the projects in this domain:

- Improved access to and version control of documentation, ensuring consistent information and minimising the time spent administratively sourcing documents;
- Improved collaboration between employees and key stakeholders;
- Increased document security and control ensuring regulatory compliance;
- Improved document archiving and backups, minimising risks of lost documentation; and
- Improved quality and access to asset design and drawing management documentation supporting design processes and improving the proactive management of asset lifecycles.

Appendix C: Technology Strategic Approach

Technology 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 whilst developing a better understanding of customer needs and future choices.

The Technology Strategy supports the achievement of these objectives by establishing and maintaining a technology environment that effectively enables and aligns with the AusNet Services Corporate Business Plan, strategic objectives and the Gas network objectives.

Underpinning this, the Technology Division Business Plan addresses the challenges of the existing and future environments and enables Technology 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 technology services'.

The figure below displays the interrelationship between the AusNet Services corporate strategic objectives, and the strategic approach of Technology to achieve these objectives.

Figure 42 – Technology Strategy
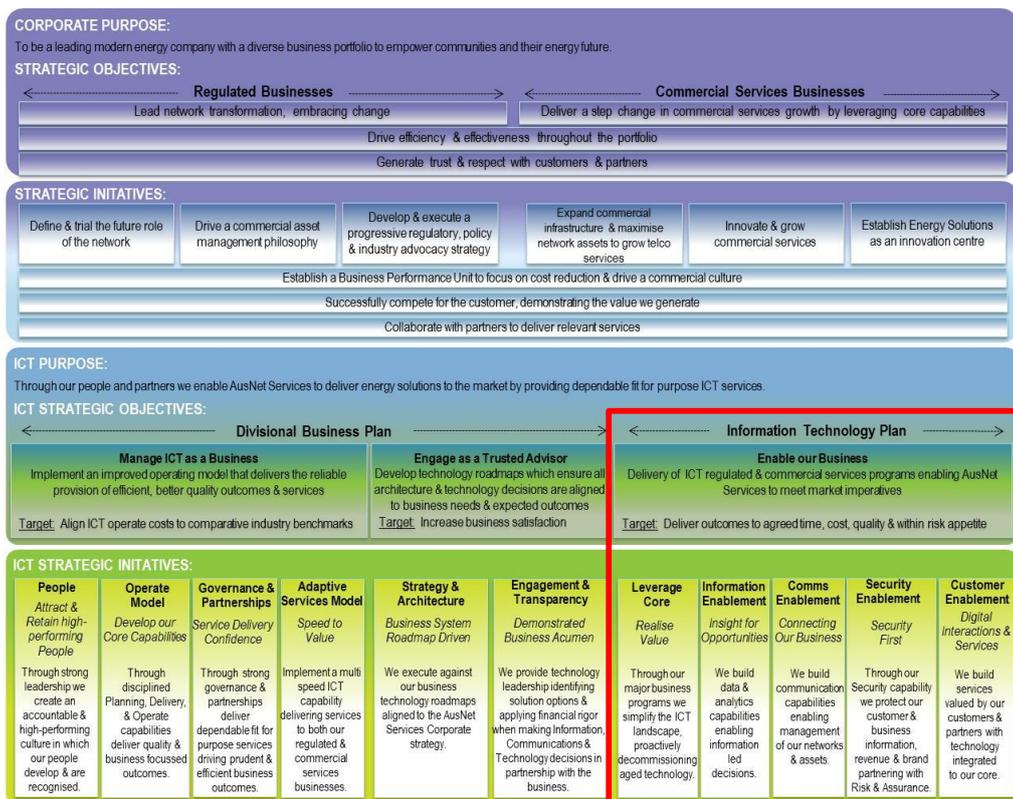
Technology Strategic Objectives

The Technology Strategy defines action across three strategic Technology objectives in support of the AusNet Services corporate strategy. Specifically, the Technology strategic objectives are:

- **Manage Technology 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.
- **Engage as a Trusted Advisor**: Develop a technology roadmap which ensures all architecture and technology decisions are aligned to the business and expected outcomes.

Enable our Business: Deliver technology information requirements and resulting programs enabling our business to meet market imperatives (i.e. EAM/ERP implementation).[10]

Technology Strategic Initiatives

The AusNet Services Technology 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.

Underpinning the Technology Strategic Objectives are a Divisional Business Plan and a Technology Plan. The Technology Plan[11] identifies the following key Technology strategic initiatives which will deliver the Technology strategic objectives:

- **Leverage Core** – simplify the technology landscape by proactively decommissioning aged technology. This includes leveraging efficiencies and costs across the three 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 and business information, revenue and brand partnering with Risk and Assurance; and
- **Customer Enablement** – build services valued by our customers and partners with technology integrated to our core.

Based on these key Technology strategic initiatives, the planned IT investments for CY2018 - 2022 will collectively enable business strategies and build on the foundational enterprise capabilities delivered in CY2013 – 2017, in particular focusing on completion of high priority lifecycle asset management and consolidation of business functions into EAM/ERP. Below are further details for each Technology strategic initiative.

Leverage Core

This initiative will simplify the technology landscape, enabling AusNet Services' business capabilities. It will also ensure that AusNet Services meets its regulatory obligations while continuing to operate in a safe and reliable manner.

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[10] AusNet Services. *ICT Business and Technology Plan.*

[11] AusNet Services. *ICT Business and Technology Plan.*

The Leverage Core Strategic Technology initiative will:

- Consolidate systems where appropriate;
- Rationalise legacy systems to drive reduced Total Cost of Ownership;
- Progressively build on the foundation platform to leverage the investment made in the current period; and
- Ensure core technologies remain current and able to support the delivery of business capabilities.

Information Enablement

This initiative will deliver data and analytics capabilities enabling integrated management of AusNet Services' customers, networks and assets. This initiative will also establish a "single source of truth" by ensuring a consistent view of all data throughout the organisation.

The Information Enablement Strategic Technology initiative will:

- Provide the capability for a consistent single source of corporate data and ensure that it meets future needs with the adaption of an enterprise Business Information Model;
- Establish capabilities to improve data quality and enable automated data management capabilities to ensure ongoing data quality;
- Provide Enterprise data and information analytics (including big data, real-time and predictive capability) supported by an Enterprise Data Lake and Advanced Analytics platform;
- Establish visualised reporting capability via a dashboard capability; and
- Consolidate current Information Management platforms including Enterprise Content and Documentation Management.

Communications Enablement

This initiative will deliver communications capabilities enabling management of the AusNet Services' networks and assets.

The Communications Enablement Strategic Technology initiative will:

- Extend the communications network;
- Refresh aging communications and infrastructure as required;
- Simplify disparate networks and improve operability by implementing standardisation and consolidation;
- Improve the resilience and reliability of communications networks by lifecycle asset management approach;
- Improve the security of the network; and
- Enable the communications network to act as the foundational service layer across the various requirements of the business, current and future.

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Security Enablement

The Security Enablement initiative will provide structured approaches for AusNet Services' to maintain security of its information, systems and network. This will enable capabilities in Threat Identification, Threat Prevention, Threat Protection and Threat Response.

The Security Enablement Strategic Technology initiative will:

- Define the enterprise security architecture required for AusNet Services to use as a basis to validate and refine the capability requirements for the following:
  - o Enable an enterprise identity and access management capability that is integrated to all core applications, and supports role-based access management and user access reporting;
  - o Enhance Security Information and Event Management (SIEM) capability to extend integration and data feeds and to extend to field devices;
  - o Enhance Continuous Monitoring and Diagnostics (CDM) capabilities to provide richer source data for the SIEM capability; and
  - o Refresh the Enterprise Gateway Security capability to ensure currency of protection measures and consolidation of multiple solutions.

Customer Enablement

This initiative will utilise information as an asset to enable AusNet Services to provide enhanced services to customers and partners.

The Customer Enablement initiative will:

- Deliver and maintain a new customer-focussed website;
- Enable an improved customer service capability through a new platform and supporting reporting and analytics;
- Build an adaptable, scalable customer energy management capability;
- Provide enhanced online self-service capability including work request initiation, notification preference management and payments; and
- Ultimately provide a Single View of customer across all businesses and platforms within the relevant regulatory frameworks.

Technology Trends

The Technology Strategy recognises that there are key technology trends that impact or influence the utility industry and AusNet Services. These trends have been considered within the context of the AusNet Services Technology program of work.

Table 43 – Key Technology Trends that have been considered to develop GAAR Technology 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	AusNet Services will: Formally integrate and align governance models and establish

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Driver	Trends	Implications and Outcomes
	of new technologies on existing platforms, challenging conventional data and operational structures to meet increasing information requirements.[12] • 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. • 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"[13]	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 Technology 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	[C-I-C]	[C-I-C]
Smart Technology, New Platforms and	• The continuous growth of OT deployment is increasingly	AusNet Services will harness, rationalise and normalise Gas Distribution operational data for use

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

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

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Driver	Trends	Implications and Outcomes
Big Data	modernising the network through smarter technology, which enhances monitoring and control of supply.	by stakeholders 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 to improve completeness, currency and consistency. This will enable AusNet Services to leverage and exploit data as an invaluable asset, and make more informed and meaningful decisions, thus transforming data into actionable insights.
Cloud Computing and Server Virtualisation	• IT vendors are increasingly moving their business models to "Anything as a Service" (XaaS), offering cloud computing as a preferred option. Examples include Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). • Cloud services are rapidly approaching maturity and are expected to become the default model of procuring and running technology services for many organisations. • Cognisant of providing cost-effective services whilst maintaining a safe, secure and reliable gas distribution network, AusNet Services will seek to harness cloud services where it is prudent and secure to proceed.	AusNet Services will mitigate data capacity growth requirements by tactically migrating data into cloud solutions as appropriate or laying the foundation for cloud readiness. This will enable AusNet Services to: • Benefit from an on-demand self-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

Driver	Trends	Implications and Outcomes
		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

The planned technology investments enable business strategies and will therefore build on the foundational enterprise capabilities delivered in CY2013 - CY2017, focusing on customer service, customer safety, security of the distribution system, and technology that support the Gas Distribution Network (assets, work, people, and field mobility).

The planned future state will support:

- Improved customer centricity and 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; and
- 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 Technology 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.

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Figure 44 – AusNet Services' Technology Road Map – Business Capability[14]

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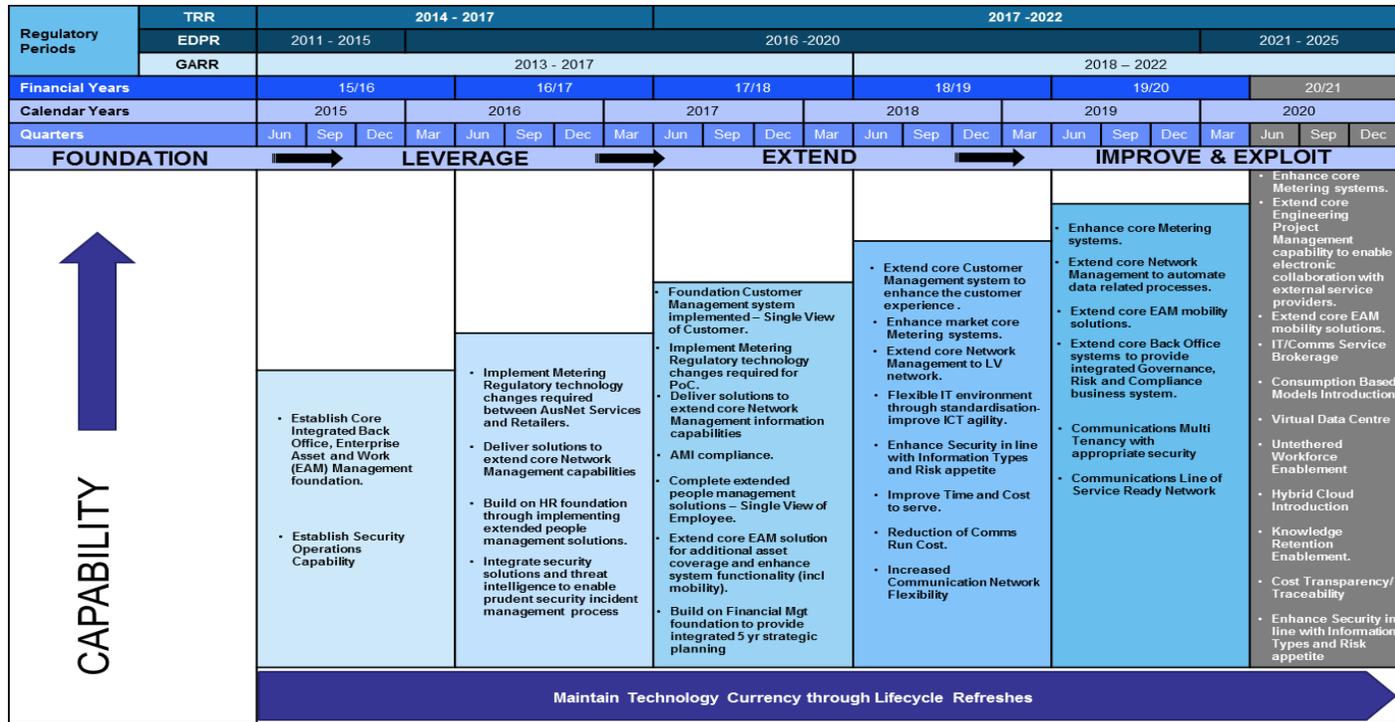
[14] AusNet Services. (2015). *Technology Plan Executive Presentation Overview.* p. 7.

Appendix D: Capital Requirements CY2018 – 2022 – Detailed Program of Work

The Technology capital works program for the CY2018 – 2022 access arrangement period consists of seven domains, namely:

- Network Management;
- Information Management;
- Metering and Customer Service;
- Works and Asset Management;
- Information Security;
- Corporate; and
- Information Technology.

The following sections describe in detail each of these domains

Network Management

Business Reason

The priority of the Technology Network Management domain is to complete high priority lifecycle management of key network systems in line with the technology lifecycle and vendor roadmaps to support the reliability, safety and security of the distribution systems.

Scope

The scope of programs and respective projects are described below.

Network Management Technology Lifecycle Management Program

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

Table 45 – Network Management Technology Lifecycle Management Program

Project Name	Project Description
Lifecycle Management of SCADA Systems	Manage the platform which underpins all real time network monitoring, control and management systems in line with its technology lifecycle to maintain system reliability, reduce increased costs associated with supporting end of life applications, and decrease security risk.
Lifecycle Management of 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.
	Integrate the dataset and underlying platforms of the current geospatial database platform for the gas network, SDMg, to the existing Enterprise Asset Management platform (EAM/ERP) to allow data on assets in the gas network and geo-spatial information to be standardised and accessible across the organisation.

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Timeframes

Indicative timeframes for the implementation of proposed projects are provided below.

Figure 46 – Network Management Domain Timeline of Proposed Projects
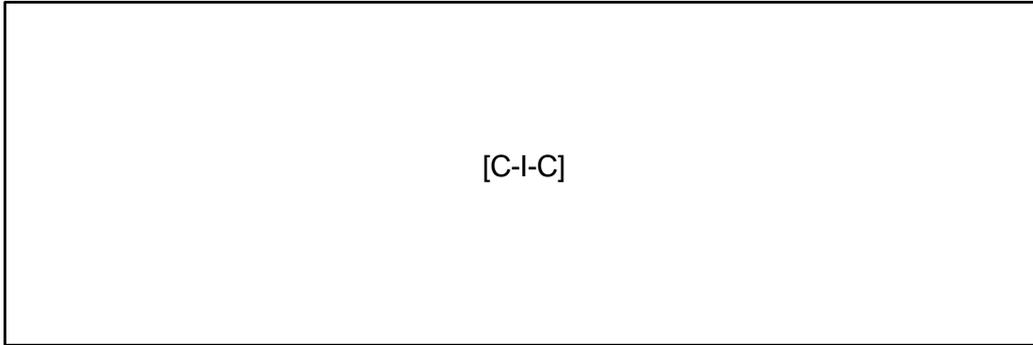
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 47 – Network Management Domain Forecasted Costs

| Project/Program Names	Total Capital Spend
Lifecycle Management of SCADA Systems	**$[C-I-C]**
Technology Lifecycle Management of Network Management	**$[C-I-C]**
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

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

Figure 48 – Network Management Domain Business Benefits
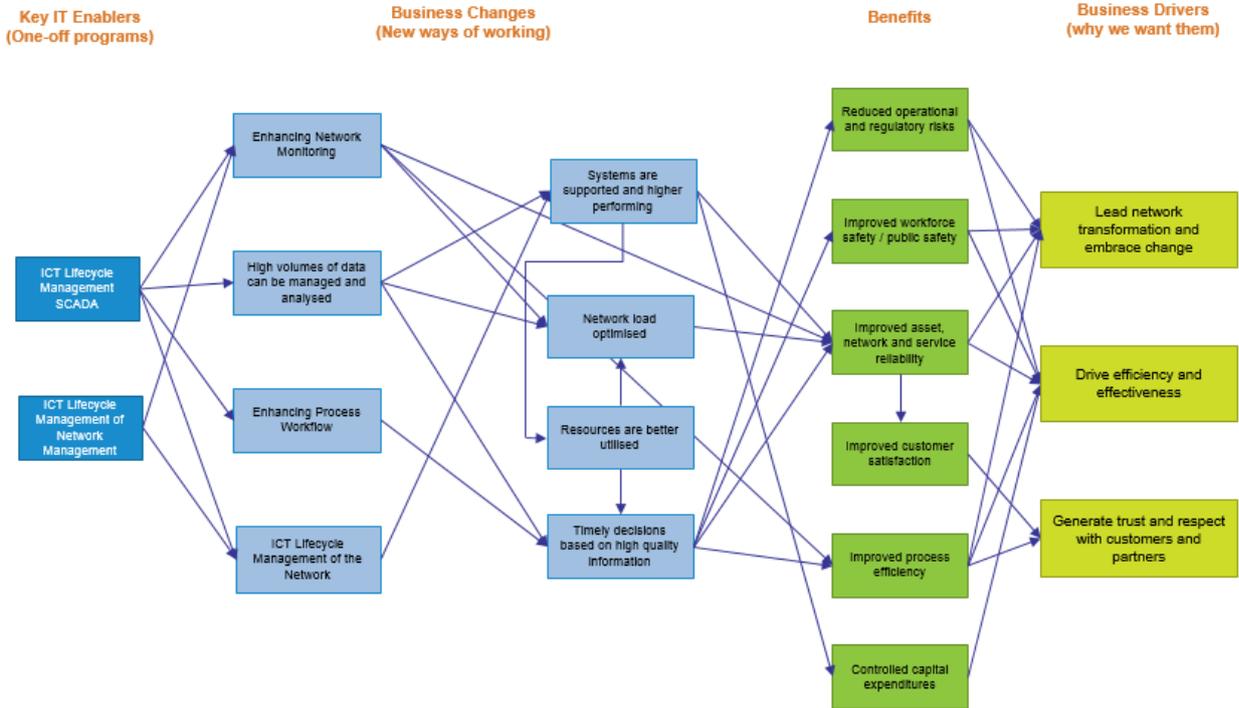
Options Analysis

The Network Management program focuses on the replacement of end of life systems in line with the technology lifecycle and vendor roadmaps. This program will address the risk of failure due to aging systems nearing end of life.

This expenditure is critical to manage the reliability and stability of systems ultimately ensuring network safety, resilience and reliability. The consequences of doing nothing include:

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

    - 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.
- 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 are provided below.

Table 49 – Network Management Risk Assessment

Risk	Consequences
Risk 1: Unable to monitor and control the Network	If the platform underpinning real time systems fails as it is out of vendor support and there is a planned or unplanned outage on the network, protection engineers will not have sufficient information nor remote access and control to configure protection measures on the network. This will force them to perform time consuming manual checks, consuming expensive resources and increasing the scope for manual error and network failure. Prolonged outages to the network will mean a failure to meet regulatory requirements and standards and manage network performance. This will also compromise continuity of supply to the customer.
Risk 2: Spatial system malfunction or fail	If the spatial systems support expires, the vendors will only provide limited assistance. AusNet Service will have to depend on internal resources, specialist contractors and customisations to support the spatial systems. System malfunctions or failures may cause a disruption to the distribution network.
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.

Information Management

Business Reason

The purpose of this domain is to build data and analytics capabilities to improve the management of AusNet Services networks and assets. The domain 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 be augmented to ensure current and future requirements are met.

AusNet Services is operating within an industry confronted by a number of challenges. Customer and regulator expectations are continuing to increase and change, especially in terms of convenient and flexible access to accurate data. 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, energy consumption and outages. Similarly, regulatory requirements place greater emphasis on the discoverability of key information for regulatory enquiries and submissions.

The key business objectives of this domain 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); and
- To have the right tools 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 five main strategic programs that each comprises several projects aiming at delivering the necessary capabilities as described below:

Enterprise Data Creation, Storage and Integration Information Management Program

This strategic program 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 program will deliver the foundational capabilities that are required to create, store and move the data in a consistent way across the entire organisation.

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Table 50 – Enterprise Data Creation, Storage and Integration Information Management Program

Project Name	Project Description
Business Information Model	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 Information Management Program

This strategic program 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 51 – 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 Information Management Program

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

Table 52 – 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 Information Management Program

This strategic program 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 53 – 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.

### Enterprise Information and Data Lifecycle Management Program

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

Project Name	Project Description
Enterprise Model Repository Lifecycle Refresh	These projects perform lifecycle refreshes of Information Management systems nearing end of life and requiring refreshes to a version that is supported and aligned to the vendor's product roadmap.
Data Quality Monitoring and Remediation Platform Lifecycle Refresh	
Data Lake Lifecycle Refresh	
ETL, Metadata Management, and Advanced Analytics Platform Lifecycle Refresh	
Integrated Data Warehouse Lifecycle Refresh (KPI)	
Business Intelligence Platform Lifecycle Refresh	

Timeframes

Indicative timeframes for the implementation of proposed projects are provided below.

Figure 54 – Information Management Domain Timelines of Proposed Projects
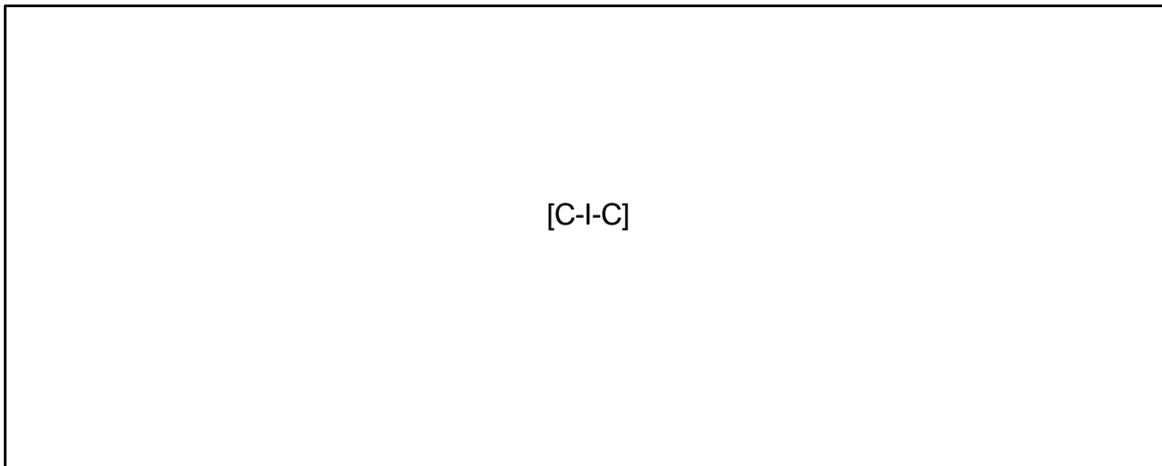
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of the proposed projects is provided below.

Table 55 – Information Management Program Proposed Forecast Cost

Project/Program Names	Total Capital Spend
Enterprise Data Creation, Storage and Integration	$[C-I-C]
Improve Data Quality	$[C-I-C]
Enhanced Decision Making	$[C-I-C]
Information Management Augmentation	$[C-I-C]
Enterprise Information and Data Lifecycle Management	$[C-I-C]
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

Benefits expected to be realised from the delivery of this domain are provided below.

Figure 56 – Information Management Domain Business Benefits
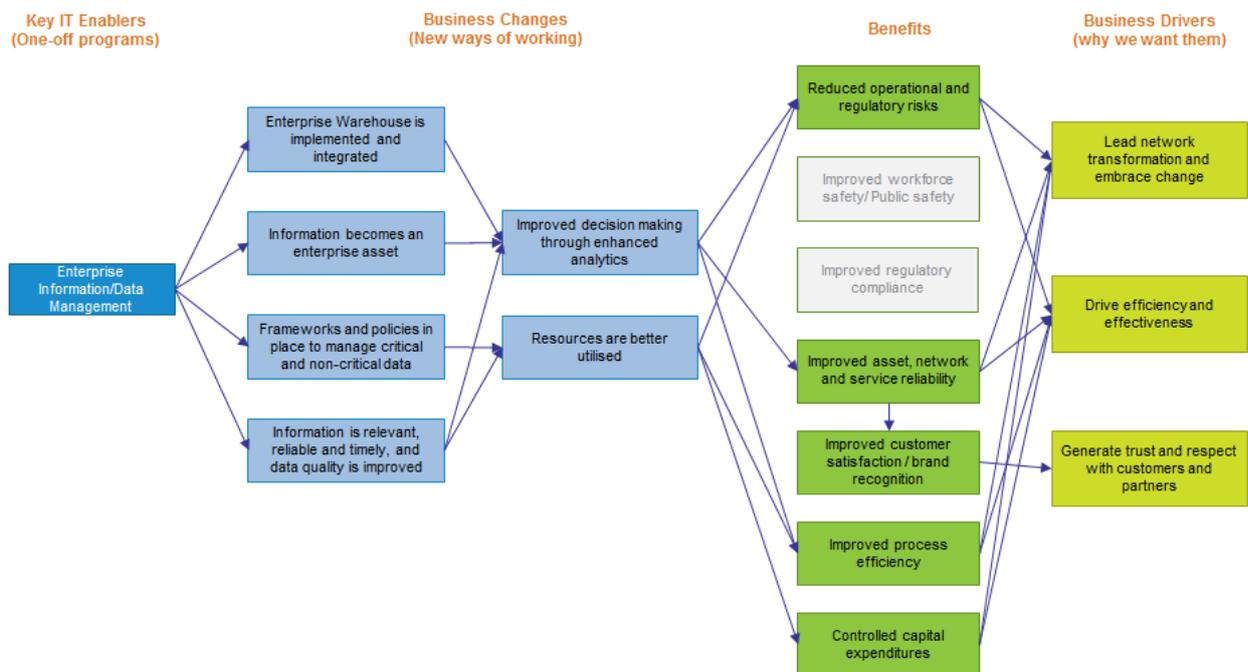
Options Analysis

The Information Management domain focuses on the need to deliver a step change in its enterprise-wide information management capability through a focus on improved processes and governance, structures and tools that allow the business and stakeholder to benefit from improved management, integration, data quality, analytics and decision making. This expenditure is critical to achieving the benefits stated above and the consequences of doing nothing include:

- Inability to respond accurately with sufficient details to regulators, or other stakeholders that require AusNet Services to provide information to support customer, regulatory, legal and/or compliance obligations;
- Limited ability to use information management to drive whole of business decision making as data stored across siloed systems;
- Increased timeframe to turn around information requests with impacts on business processes and efficiencies;
- Reduced data integrity as information is held in a number of disparate systems and tools without the appropriate data structures and governance;
- 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"); and
- Inability to store and manipulate 'big data' to support decision making.

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 are provided below.

Table 57 – Information Management Risk Assessment

Risk	Consequences
Risk 1: Inability to respond accurately with sufficient details to regulators, or other stakeholder obligations	Potential financial penalties that could damage corporate brand. Loss of overall credibility with key stakeholders.
Risk 2: Information is held in a number of disparate systems	Hosting information in disparate systems increases the risk of inconsistencies in data. This reduces the integrity of data that is used in analytics and reporting, limiting the reliance on data to drive decision making
Risk 3: 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 4: 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.

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Risk	Consequences
Risk 5: 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 6: 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 7: 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 obsolete data.
Risk 8: Inability to meet data storage requirements due to increased datasets captured (e.g. 'big data')	Inability of Technology to meet requirements for data storage, therefore a lack of agility to employ new technologies and practices to utilise data. Significant investment in infrastructure required to store additional data.

Metering and Customer Services

Business Reason

The AusNet Services Metering and Customer Services domain focuses on improving customer service and engagement to ensure the business is equipped with the appropriate systems and tools to continue to meet regulatory and customer requirements. Customer expectations are evolving and as such there is higher demand for information around outages and an expectation on AusNet Services to communicate and respond to requests for information via multiple channels.

This period provides the opportunity to leverage core enterprise foundations to further enhance existing customer related capabilities and improve the customer experience using integrated Customer Relationship Management (CRM) applications. This will enhance AusNet Services ability to effectively and efficiently manage customer, regulatory and stakeholder obligations via a central system. The domain 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 will host key data including stakeholders, governance / escalation paths, and documentation on engagement and interactions.

Scope

The scope of programs and respective projects are described below.

Develop a Customer Centric Utility Program

The program seeks to create a single view of the customer which will be used to improve customer service levels and meet the increasing information needs of customers.

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Table 58 – Develop a 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 outage notifications and faults handling, and ensure workforce safety by identifying site hazard locations.
Gas Digital Metering	A program to improve digital capabilities. The results of this program will help AusNet Services determine the benefits of this technology for customers and the gas distribution network and enable more informed decisions for a broader deployment of this technology. This program is required due to the risk of technology obsolence in the future.

Customer Digital Enablement Program

The program seeks to refresh and enable communication channels to engage customers via mobile and digital technologies.

Table 59 – 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.

Technology Lifecycle Management Metering & Customer Systems Program

Mandatory replacement of key market and customer systems to align to product roadmaps and future business requirements.

Table 60 – Technology Lifecycle Management Metering & Customer Systems Program

Project Name	Project Description
Technology Lifecycle Management – Metering and Customer Systems	Replace existing systems in alignment with their asset lifecycle and vendor roadmaps to support multiple business functions.
CRM Software Upgrade (CRM Maintenance)	This project is a lifecycle refresh of the customer relationship management (CRM) applications ensuring it continues to be supported by vendors and receive all the latest patches and bug fixes.

Timeframes

Indicative timeframes for the implementation of proposed projects are provided below.

Figure 61 – Metering and Customer Services - Timeline of Proposed Projects
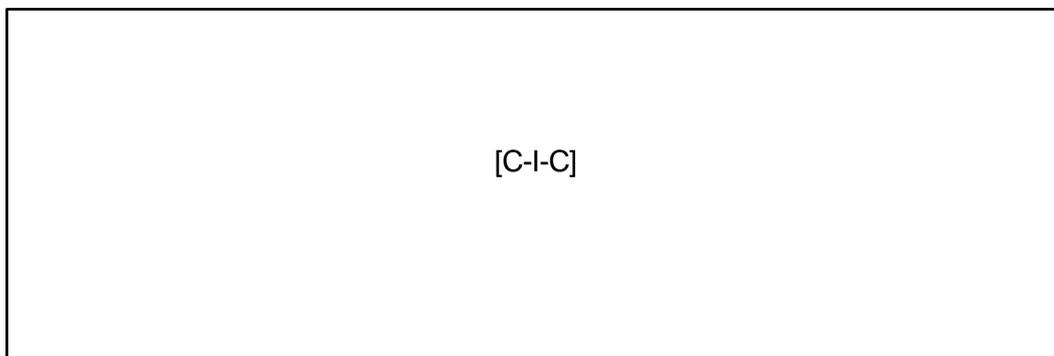
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 62 – Metering and Customer Services Forecast Costs

| Project Names	Total Capital Spend
Internet Re-platform	$[C-I-C]
Implement Enterprise Wide CRM	$[C-I-C]
Technology Lifecycle Management – Metering and Customer Systems	$[C-I-C]
CRM Software Upgrade (CRM Maintenance)	$[C-I-C]
Gas Digital Metering (Systems)	$[C-I-C]
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

Benefits expected to be realised from the delivery of this domain are provided below.

Figure 63 – Metering and Customer Services domain Business Benefits
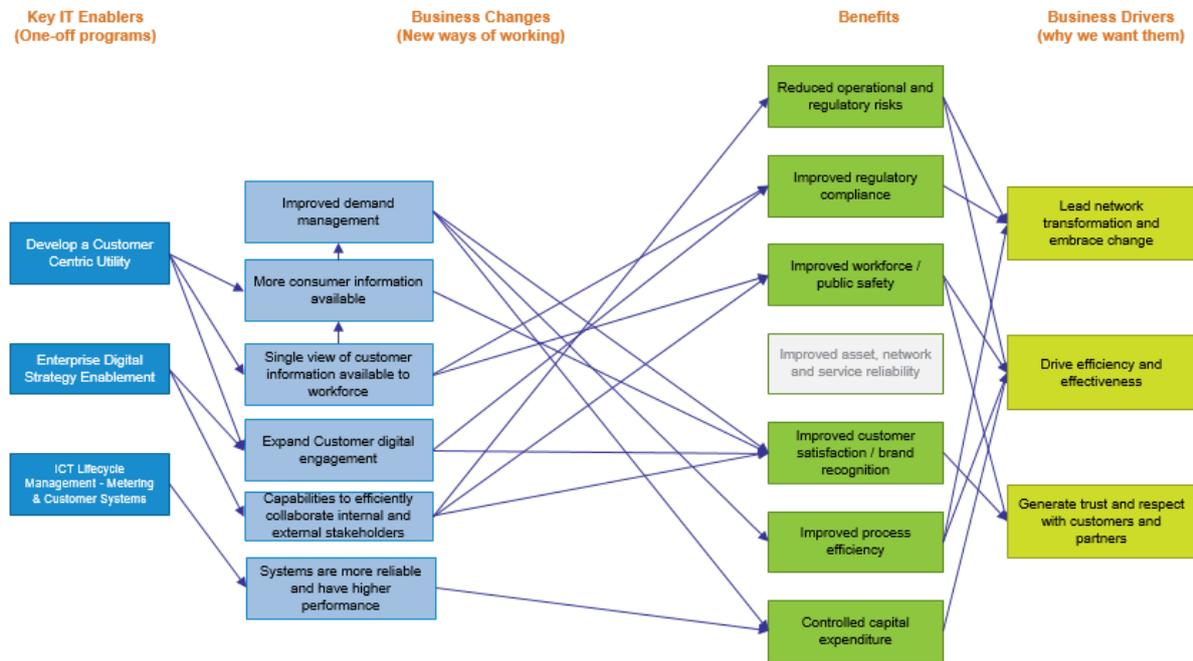
Options Analysis

The Customer domain is focused on updating digital platforms to interface with customers (e.g. distributors, generators and ultimately end customers) and investing in Customer Relationship Management (CRM) capabilities ensuring relevant information gathered across the network is available to customer functions in the enterprise environment at AusNet Services.

This expenditure is critical to achieving the benefits stated above and the consequences of doing nothing include:

- Unable to meet customer demands for more readily available and timely information;
- Unable to reap the benefits of additional technology designed to improve the information flow between field and office and consequently customer;
- Inability to manage safety risks for site visits and life support customers;
- Negative customer experience; 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 of work. Key identified risks and associated consequences are provided below.

Table 64 – Metering and Customer Services Risk Assessment

Risk	Consequences
Risk 1. Safety hazards are not managed appropriately	Without appropriate dissemination of network incident and network safety information to customers there is a risk that customers could place themselves in unnecessary risk of health and safety incidents.
Risk 2: Deteriorating reputation due to poor customer experience	If AusNet Services does not have the requisite systems in place to respond to customer queries and requests (e.g. regarding network outages or planned work), the customer will ultimately be dissatisfied with the company as a whole. This will then lead to 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 Technology Works and Asset Management domain 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 gas supply services.

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 provide 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.

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Scope

The scope of programs and respective projects are described below.

Field Mobility for Customer Response and Public Safety Program

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:

- Efficiently scheduling work at a fault address and utilising alerts in the field for assets which have 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; and
- Augmenting existing mobile capabilities with prebuilt enterprise mobile applications.

Table 65 – 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).
Fiori mobility	Provides the user interface toolset to deliver standard back office functionality to field staff users (e.g. Timesheet completion, Purchase order approvals).

Technology Lifecycle Management CAD & Drawing Management Systems Program

AusNet Services is the custodian of approximately 100,000 distribution drawings. Drawings support and guide activities related to maintenance and replacement of network assets, therefore contributing to the reliability, safety and 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.

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Table 66 – Technology Lifecycle Management CAD & Drawing Management Systems 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 Program

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; and
- Leveraging ERP functions and realise benefits – business rules for work orders and notifications, resource demand planning for maintenance planning, financial planning, capacity planning.

Building Management

[C-I-C]

Project Name	Project Description
CEOT Move	[C-I-C]

Timeframes

Indicative timeframes for the implementation of proposed projects are provided below.

Figure 67 – Works and Asset Management Timeline of Proposed Projects
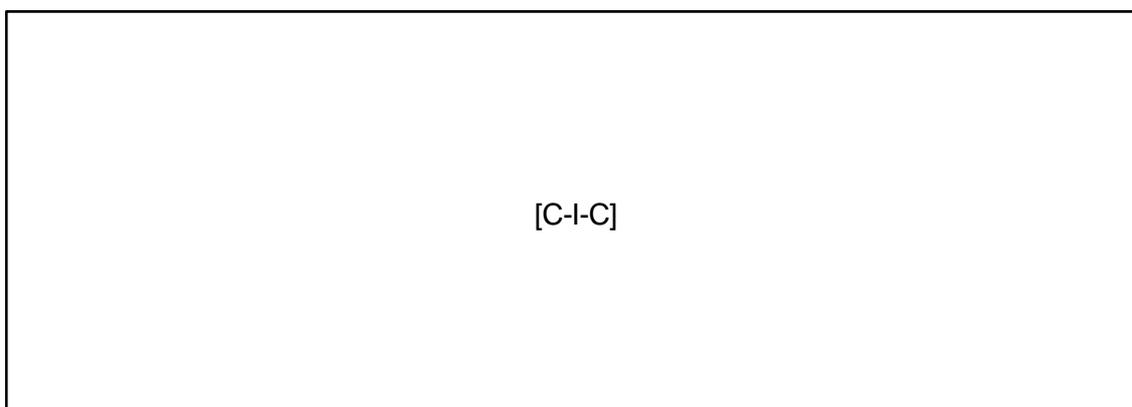
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 68 – Works and Asset Management Forecast Costs

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

Amounts are 2017$ direct (excluding overheads)

Business Benefits

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

Figure 69 – Works and Asset Management Domain Business Benefits
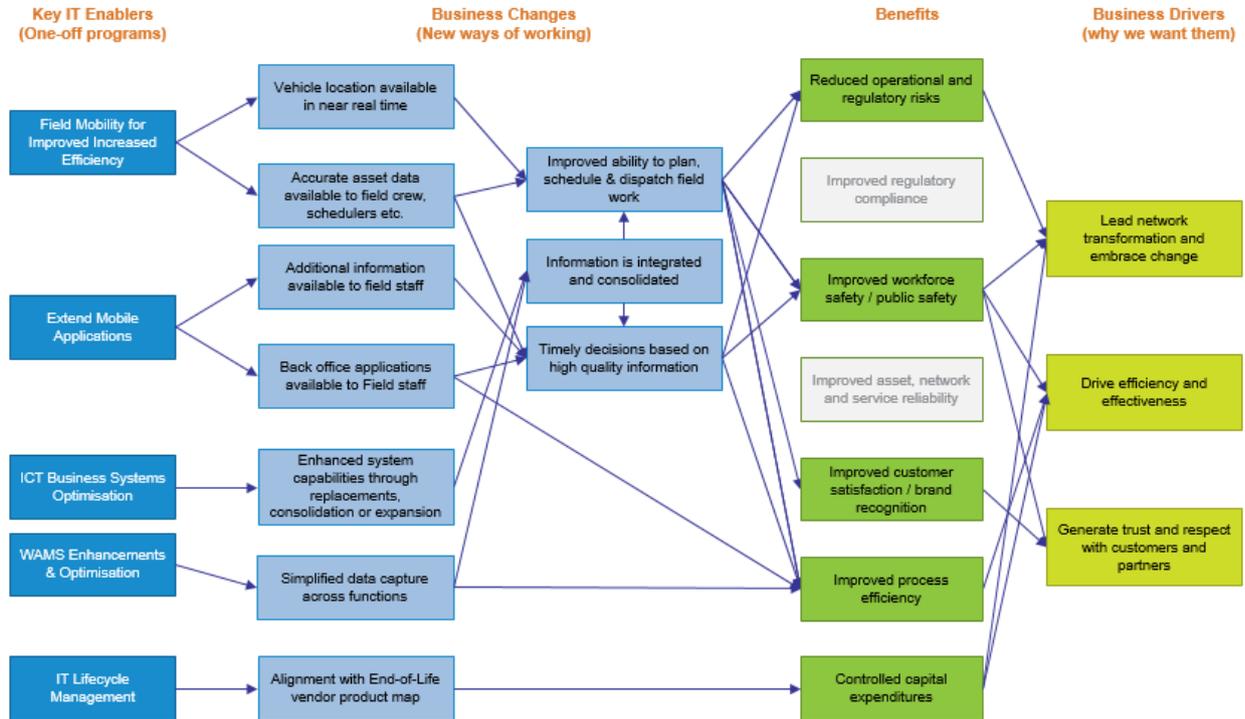
Options Analysis

This domain 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; and
- 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 70 – Works and Asset Management Risk Assessment

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

The focus of Information Security domain is to build the Technology security capabilities required to protect the AusNet Services technology network from cyber-intrusion. Cyber-security is a serious and ongoing challenge for the energy sector, which is part of the critical national infrastructure[15]. Cyber threats to energy delivery systems can impact national security, public safety, and the national economy. Therefore, it is paramount that AusNet Services invests in strengthening the security of the technology network and maintaining the currency of existing technology security solution.

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[15] Australian Cyber Security Centre. (2015). *ACSC 2015 Threat Report*.
https://www.acsc.gov.au/publications/ACSC_Threat_Report_2015.pdf

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The Information Security domain 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.

Each program of work is grouped into one of the following 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; and
    - o Industrial Control Systems (ICS) Asset Security Testing

This will improve the governance and decision making for Information Security and support the identification of security weaknesses of ICS assets.

- 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. The key outcomes of the protect capabilities includes asset control, awareness training, data security, information protection and processes and procedures. AusNet Services has identified the following projects to enhance their current 'Protect' capability:

    - o Enterprise Gateway Security Refresh;
    - o Enterprise Identity and Access Management (IDAM);
    - o Cryptographic Controls Refresh & Augmentation;
    - o Remote systems test bed; and
    - o Secure engineering devices.

These projects will protect AusNet Services' Technology network by streamlining the user lifecycle and access management processes, allowing more stable patches installation and creating a secure network for field devices.

- The 'Detect' capability provides the process and tools which will enable IT Security staff to detect cyber-threats and attacks in a timely manner. The key outcomes of the detect capabilities includes anomalies and events detection and continuous security monitoring. AusNet Services has identified the following projects to enhance their current 'Detect' capability:
    - o Security Information and Event Management (SIEM) Augmentation;
    - o Continuous Monitoring and Diagnostics (CDM);
    - o Database Security Controls;
    - o Implement authentication proxy; and
    - o Integrate authentication-proxy to SIEM.

These projects will improve authentication and access permissions to AusNet Service's database and Industrial Control System (ICS) devices, enable attack pattern detection and automatically alert the security administrator if there is an intrusion attempt.

- The 'Respond' capability provides response technologies and processes that allow the organisation to take action against a detected cybersecurity event. As cyber-intrusion techniques become more advanced, preventative technology security measures must be supplemented with measures to respond to intrusion and malicious activity.

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AusNet Services has identified the following projects to enhance their current 'Respond' capability:
- o Security Operations Centre (SOC) Toolset Capability.

This will integrate disparate information for decision making.

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

Table 71 – 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 Program

Table 72 – Enterprise Information Security Enablement Program

This program seeks to improve the security capabilities of AusNet Services by implementing new technologies and capabilities to address cyber-risks to the business and maintaining the effectiveness of existing controls to protect the network against a dynamic and rapidly changing cyber-threat environment.

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.

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| Project Name	Project Description
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 environment management systems not in scope for initial deployment, including: 1. SAP EAM/ERM/GRC; 2. Database Access Management (DAM); and 3. Any new technologies implemented in this 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 Security Controls	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 (SOC)	Enhance SOC capabilities to interpret alerts and escalate to incident response team. Supplement capabilities not covered through continuous monitoring and SIEM initiatives.
Implement authentication proxy	This initiative creates the authentication proxy to enforce authentication to new or legacy ICS device, incorporating lockout policies to reduce risk of brute force attempts.
Integrate auth-proxy to SIEM	This initiative creates integration from the Authentication Proxy to SIEM (Security Information and Event Management), a software product that provides real-time analysis of security alerts generated by network hardware and applications. This will enable the rationalisation of security events data from the Authentication Proxy to SIEM, ensuring that the security administrator only receives critical security data to analyse.
Remote systems test bed	The remote system test bed is a collection of virtual servers that are pre-configured as a duplicate of the production environment remote system's applications and operating systems. The purpose of this initiative is to allow critical patch and operating system to be tested prior to going into production systems and thus increase the security of the AusNet Services network.

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Project Name	Project Description
ICS Asset Security Testing	This initiative creates a testing platform to safely test and investigate new technology assets and associated software for security vulnerabilities prior to their deployment into the AusNet Services Technology Network. This testing platform will support the identification security and identify security requirements for the procurement of future Industrial Control System (ICS) devices.
Secure engineering devices	The purpose of this initiative is to create a secure network for field devices. There are several sub-projects within this initiative, including enforcing of authenticated devices, NAC (Network Access Control), OS and app whitelisting and file integrity monitoring.

Timeframes

Indicative timeframes for the implementation of proposed projects are provided below.

Figure 73 – Information Security: Timeline of Proposed Projects
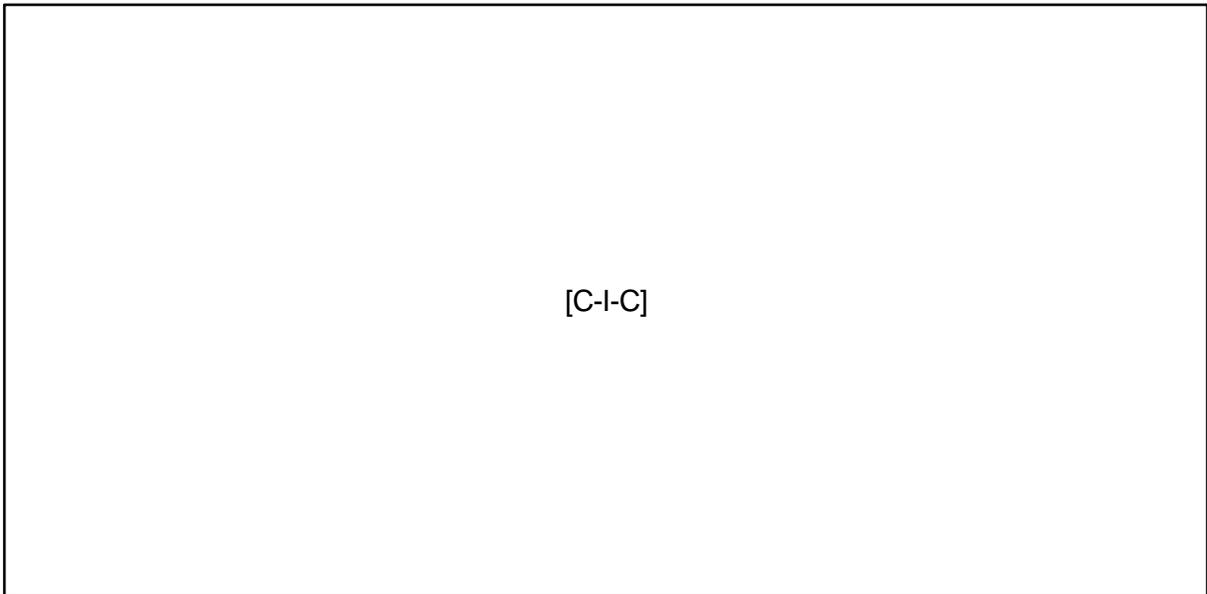
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 74 – Information Security Forecast Costs

Project Names	Total Capital Spend
Enterprise Identity and Access Management (IDAM)	**$[C-I-C]**
Security Operations Centre (SOC)	**$[C-I-C]**
Enterprise Gateway Security Refresh	**$[C-I-C]**
Continuous Diagnostic Monitoring	**$[C-I-C]**
SIEM Augmentation	**$[C-I-C]**

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Information Security Governance Risk and Compliance	**$[C-I-C]**
Cryptographic Control Refresh & Augmentation	**$[C-I-C]**
Database Security Controls	**$[C-I-C]**
Implement authentication proxy	**$[C-I-C]**
Integrate auth-proxy to SIEM	**$[C-I-C]**
Remote systems test bed	**$[C-I-C]**
Define an ICS asset template / vendor pattern list	**$[C-I-C]**
Secure engineering devices	**$[C-I-C]**
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

Benefits expected to be realised from the delivery of this domain are provided below.

Figure 75 – Information Security Domain Business Benefits
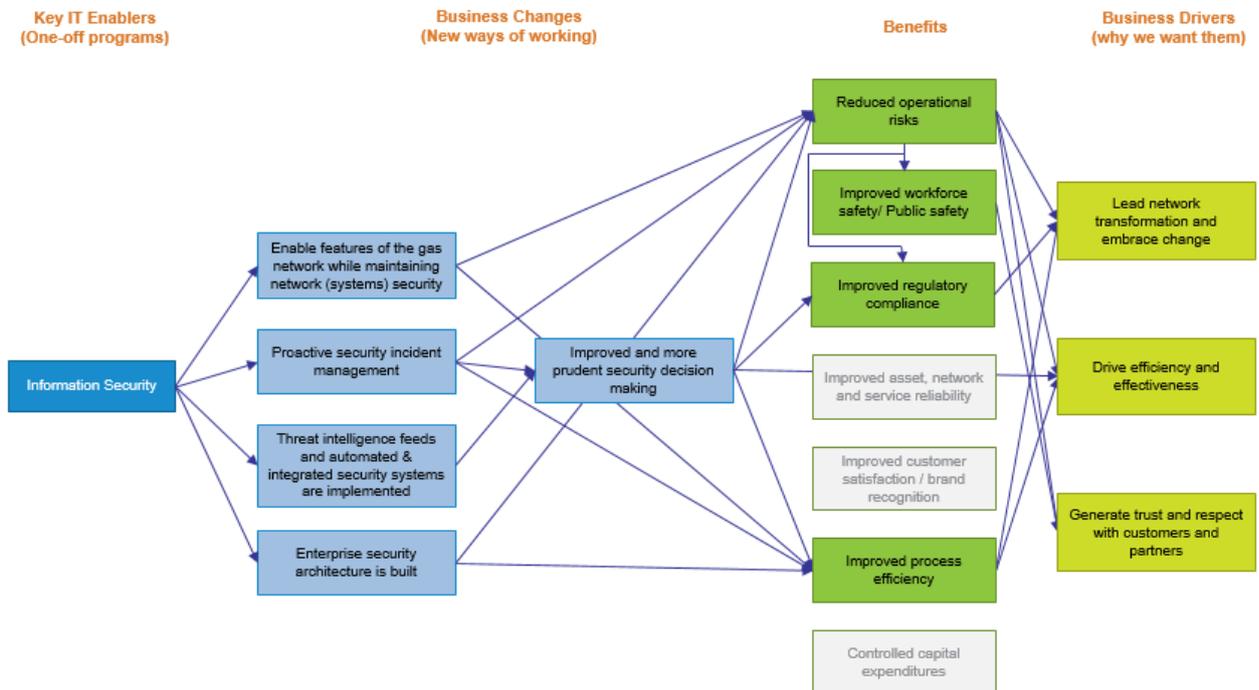
Options Analysis

The Information Security domain focuses on delivering security capabilities that are required to protect the gas distribution network, and customer and business information ensuring that compliance requirements are met. It will focus on reducing cyber security risk and strengthening the

technology network security. This expenditure is critical to achieving the benefits stated above and the consequences of doing nothing include:

- Increased cyber-attack risk on SCADA infrastructure with the potential to interrupt business critical network management processes;
- Increased risk for misuse of confidential information or public publication of private and consumer information;
- Increased risk of systems disruption due to deployment and testing of security patches in the production environment;
- Incurring large fine due to disruption from Cyber-Attack that switched off the gas distribution network
- 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; and
- 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 are provided below.

Table 76 – Information Security Risk Assessment

Risk	Consequences
Risk 1: Unauthorised systems access that may lead to cyber-attack on the SCADA infrastructure	Malicious intrusion on AusNet Services systems through a security weakness in the Technology network. This intrusion may lead to a disruption to Technology systems and network services and a loss of confidential data.
Risk 2: No dedicated ability to detect cyber-intrusion	Cyber-intrusion is not identified due to a lack of Information Security detection capabilities. The implication is an intruder can gain access to computers, network and devices and perform malicious activity.
Risk 3: Technology systems are not up-to-date with the most recent Technology Security patches	Each security patch contains critical security fixes that improve the resilience of the respective system. Failure to deploy the security patch leads to gaps and loopholes in the security of the application, increasing the propensity for cyber intrusion. A security loophole may introduce a cyber-disruption. Examples of disruption of services or network includes activities such as denial of service, web defacement and electronic graffiti to disrupt AusNet services business lines In conjunction, a reduced success rate of patch deployment will also reduce the confidence of security administrators to deploy more patches to the production environment.
Risk 4: Installation of programs that contains malware or virus	Malware or viruses can infiltrate a specific systems and spread across the network causing disruption of service and a loss of confidential data. The collection, dissemination and use of this data by unsolicited parties can have significant operational and reputational impacts to AusNet Services.
Risk 5: Security weakness due to a lack of security governance	A lack of security governance (e.g. the management of permissions and user-authentication) may cause a security loophole. If password resets are managed manually, the

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Risk	Consequences
	cancelling of access rights may be overlooked by the security administrator due to time constraints or human error. This might lead to unauthorised users accessing systems they no longer have permissions for, or cause an intruder to successfully brute force the password and gain access to the system.
Risk 6: Unlicensed software executed on the network	AusNet Services breach software contracts which may lead to financial penalties and legal ramifications.
Risk 7: No visibility of service impacts	Service interruptions go undetected or root cause analysis delayed.
Risk 8: Unauthorised access through users	Exposure of confidential information to unauthorised third parties.

Corporate

Business Reason

The focus of the Corporate domain 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 Gas 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 Technology 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 Programs

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.

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Table 77 – 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 Program

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 78 – Improved Statutory & Regulatory Reporting Program

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 EAM/ERP, to enhance and streamline planning, budgeting and forecasting capabilities.

Corporate Technology Lifecycle Management Systems Program

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 79 – Corporate Technology 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 Program

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 80 – 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.

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Technology Lifecycle Management Digital Collaboration Program

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. 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 81 – Technology Lifecycle Management 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.

Technology Lifecycle Management (SAP) Program

This program seeks to perform refreshes and patching of all SAP modules as aligned to the standard technology lifecycle. This will ensure access to standard enhancements and defect resolutions to support the ongoing needs of AusNet Services.

Table 82 – Technology Lifecycle Management (SAP) Program

Project Name	Project Description
EAM/ERP Patching and Enhancement Pack	The purpose of this initiative is to perform required lifecycle maintenance and patching of the EAM/ERP solution. Specifically: • Initial upgrade of the existing SAP [C-I-C] module; and • Ongoing patching of all SAP modules to ensure access to standard enhancements and defect resolutions to support the ongoing needs of AusNet Services.

Centralised Employee Management Capabilities Program

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 83 – 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 provided below.

Figure 84 – Corporate Domain Timeline of Proposed Programs
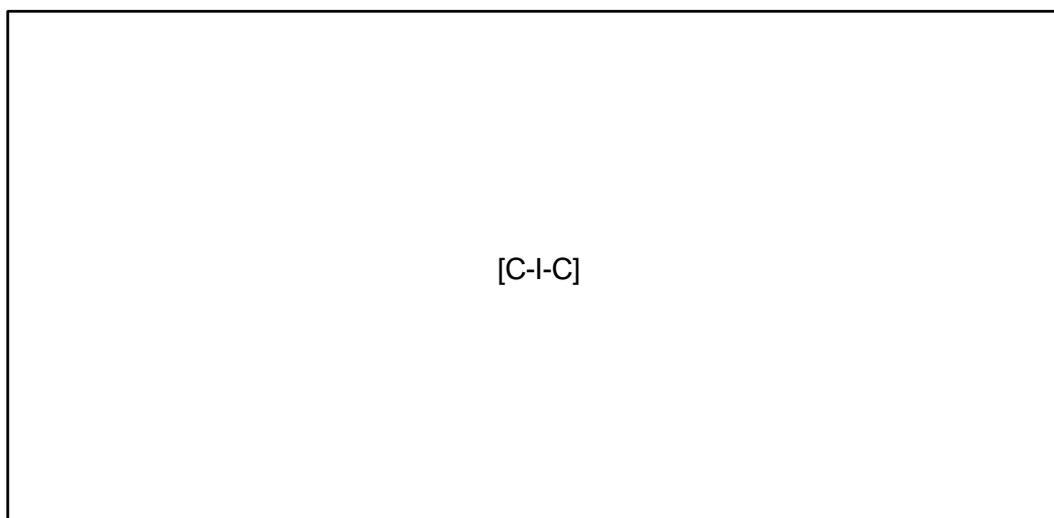
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 85 – Corporate Forecast Costs

Project/Program Names	Total Capital Spend
HSEQ Management System	**$[C-I-C]**
Corporate Model (Corporate Modelling in SAP-BPC)	**$[C-I-C]**
Upgrade Treasury Solution (Quantum SaaS)	**$[C-I-C]**
Upgrades of Corporate Business Systems	**$[C-I-C]**
Implement E-GRC Solution	**$[C-I-C]**
Technology Lifecycle Management Digital Collaboration	**$[C-I-C]**
EAM/ERP Patching and Enhancement Pack	**$[C-I-C]**
Centralised Employee Management Capabilities	**$[C-I-C]**
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

Benefits expected to be realised from the delivery of this domain are provided below.

Figure 86 – Corporate Domain Business Benefits
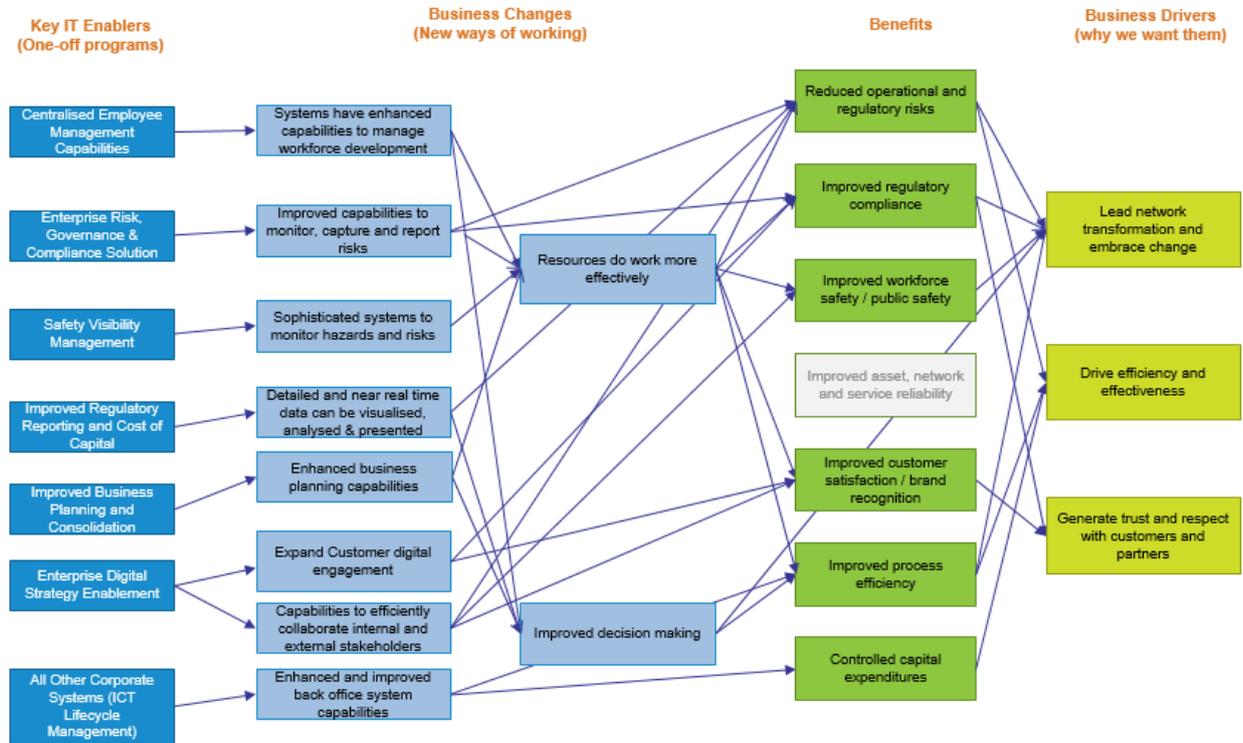
Options Analysis

The Corporate domain 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.

This expenditure is critical to increase operational effectiveness, improve workforce development and collaboration and support all business functions with reliable and stable systems. The consequences of doing nothing include:

- 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; and
- 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 are provided below.

Table 87 – Corporate Domain Risk Assessment

Risk	Consequences
Risk 1: Legacy systems reach end of life and maintenance / vendors cease to provide support	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 loss of licence incurred by failure to maintain mandated training, track certification renewal dates, as well as report on safety risks according to regulatory timeframes.

Information Technology (Infrastructure)

Business Reason

The focus of the Information Technology domain will be to continue building the technology infrastructure to support current and future critical business and network systems. This will be achieved through prudent investments to simplify the current technology landscape and refresh key infrastructures including storage, enterprise servers, desktop and laptop fleets and corporate network, cloud technology and communications.

These projects will ensure that AusNet Services has sufficient capacity to securely host core service delivery systems and relevant data. Investments will be made to ensure storage of critical business data is scalable in line with business requirements and fit for purpose.

Scope

The scope of programs and respective projects are described below.

Gas Distribution Network – Technology Strategy

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

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 investment in 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 [C-I-C] % to [C-I-C] % 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; and
- The establishment of cloud storage to mitigate the large increase in customer and regulatory data.

Table 88 – 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 [C-I-C]%-complete lean virtualisation infrastructure, to provide 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 consolidate 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 ensure prudent maintenance costs.
SPARC Hardware Refresh	Replace end of life infrastructure with new infrastructure and implement standards and tools for management of [C-I-C] 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.

Gas Distribution Network – Technology Strategy

Project Name	Project Description
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) Program

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.

Table 89 – Technology Lifecycle Refresh of Other Enablement Technologies Program

Project Name	Project Description
Enterprise Service Monitoring (Extend IBM NetCool to Enterprise)	Enterprise Wide extension of the Enterprise Service Monitoring solution to ensure SLAs and time to market regulatory requirements are monitored and reported against.
Integration Platform Lifecycle Management	Replace the 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 centre 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.
[C-I-C] Database SOE Refresh (Incl. Consolidation)	Standardise and consolidate all Databases to two versions of [C-I-C} – 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 communications Program

The prudent lifecycle replacements of network and communications hardware in alignment of asset lifecycle management and ensuring compliance to business and vendor support requirements. The program will limit the need to rely on customisation and purchasing extended support to maintain applications.

Table 90 – Lifecycle Refresh of Corporate Network and Communications Program

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.
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 separate communications networks (i.e. Corporate and HiSec) 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).

Gas Distribution Network – Technology Strategy

<u>*Lifecycle refresh of enterprise server and standard operating environment (SOE) Program*</u>

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

Table 91 – 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 prudent 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 provided below.

Figure 92 – Information Technology Domain Timeline of Proposed Projects
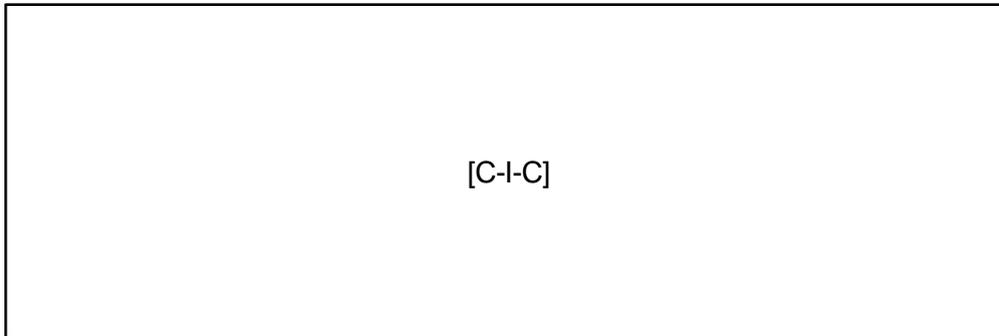
[C-I-C]

Forecast Costs

Forecast capital expenditure for the implementation of proposed projects is provided below.

Table 93 – Information Technology Forecast Costs

Program Names	Total Capital Spend
Data Storage (Lifecycle Refresh, Big Data storage growth and Cloud)	**$[C-I-C]**
Technology Lifecycle - Other Enterprise Enablement Technologies	**$[C-I-C]**
Technology Lifecycle - Corporate Network and Communications	**$[C-I-C]**
Technology Lifecycle - Enterprise Servers, SOE and Desktop Fleet	**$[C-I-C]**
Total	**$[C-I-C]**

Amounts are 2017$ direct (excluding overheads)

Business Benefits

Benefits expected to be realised from the delivery of this domain are provided below.

Figure 94 – Information Technology Domain Business Benefits
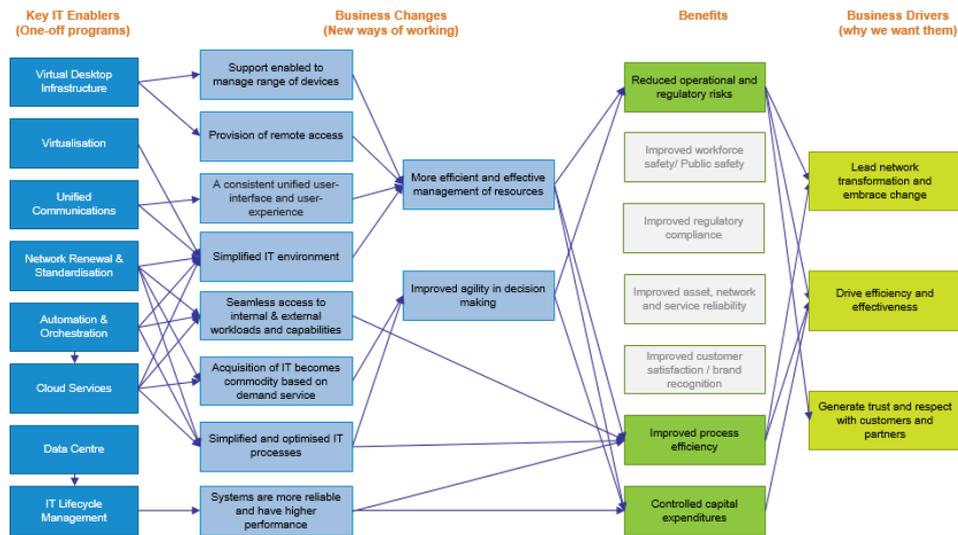
Options Analysis

The Information Technology domain focuses on upgrading core systems and technology infrastructures, and creating a scalable and agile technology platform that can support future requirements. This expenditure is critical to achieving the benefits stated above and the consequences of doing nothing include:

- 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; and
- 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 are provided below.

Table 95 – Information Technology Risk Assessment

Risk	Consequences
Risk 1: Larger data sets are gathered across the organisation to support new systems and applications but there is insufficient capacity to store the data	As AusNet Services continues to increase the automation and reach of existing systems they will depend on larger data sets and more complex applications and platforms, that then also require additional storage capacity. If the capacity of existing infrastructure is not managed in line with this growth in storage requirements, then these systems will malfunction.
Risk 2: Non upgraded systems may limit alignment to future requirements.	Systems become non fit for purpose and cannot adequately support the organisation.
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. If systems fail, recovery could be lengthy which leads to business disruption and issues meeting regulatory compliance obligations.