

Appendix 5.9: ICT expenditure proposal

Regulatory proposal for the ACT electricity distribution network 2019-24
January 2018

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1.0 Executive summary

The electricity network sector is facing rapid changes. Similar to other distribution businesses, Evoenergy is conceptually transitioning from being a Distribution Network Service Provider (DNSP) to being a Distribution System Operator (DSO).

This change is being driven by disruptive technologies that have the potential to significantly impact customers and change the way customers interact with existing electricity network assets. To ensure customers can leverage and gain maximum benefit from disruptive technologies, Evoenergy intends to focus on efficiency improvements, operational ability, process visibility, refining asset management practices and optimising operational and capital expenditure to suit the new business environment.

Distributed energy resources will provide both benefits and impose operational challenges on Evoenergy that will need to be addressed in order to transition to this new paradigm in the operation of the distribution network.

There is an imperative to enhance the understanding of customers, understand their evolving expectations and how this affects Evoenergy and its network assets, requiring Evoenergy to become a more customer-centric organisation that will deliver industry best practice customer and network services.

Evoenergy's strategic objective is to provide network services that anticipate and guide customers' evolving requirements at the lowest cost through the forthcoming uncertain energy consumption trends.

A prime requirement for the successful implementation of Evoenergy's strategy will be a flexible and comprehensive technology strategy and implementation program that underpins the transition process.

Evoenergy has identified that the following technology trends are currently impacting their business or are expected to do so in the near future and have the potential to improve the value proposition to the end customer:

- Cloud solutions which provide opportunities to reduce costs while increasing agility,
- Mobile, location and context aware technologies which create new opportunities for customer engagement and productivity gains,
- An ever-growing need for security relating to technologies to proactively monitor, detect and protect critical network operations, business processes and information,
- Rapidly declining data storage costs and improvements in processing enable cost-effective big data and analytics platforms,
- Digital Metering Infrastructure and Network Internet of Things (IoT) which is expected to provide richer, more granular data,
- Artificial intelligence and machine learning enabling automation and self-healing systems as well as predictive maintenance regimes,
- Business intelligence capabilities to improve the ability of Evoenergy to dynamically reconfigure the Network to meet customer needs through enhanced trend analysis, planning and decision making, and
- Increases in automation of business processes and workflows to increase productivity.

In delivering the above, Evoenergy is proposing capital expenditure of **\$38.2 million** for non-network Information and communications technology for Standard Control Services for the 2019-24 regulatory control period. The proposed expenditure addresses programs and projects

required for the existing ICT assets needed to support Evoenergy and also includes those required to enable future business needs. The ICT expenditure breakdown by year and category are as shown in the table below:

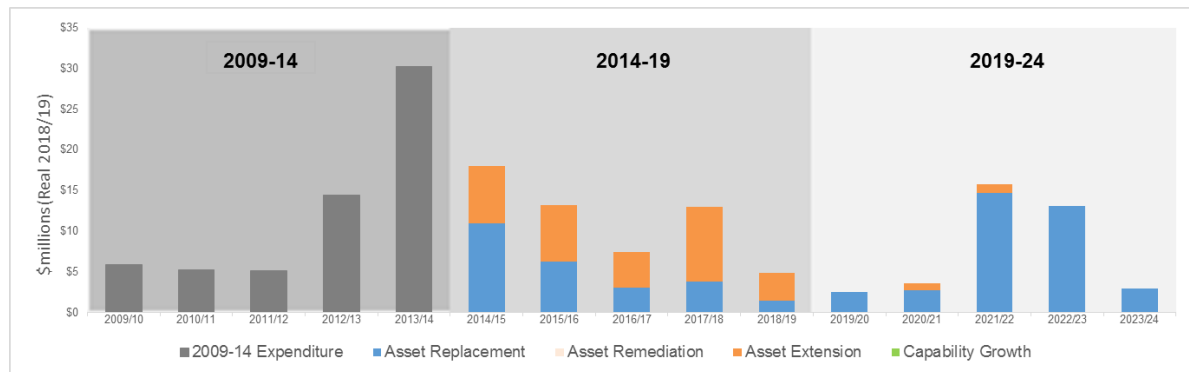
(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT capital expenditure	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
Network Asset Information Systems	\$2,248	\$2,255	\$14,476	\$12,704	\$2,952	\$34,635
Corporate IT & Communication Systems	\$261	\$1,417	\$1,377	\$450	\$35	\$3,540
Total Expenditure	\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175

The proposed projects and programs of work are consistent with the strategic directions and objectives set out in ActewAGL's ICT Strategy and align to ActewAGL's and Evoenergy's corporate vision, business strategy and goals. They have been selected to assist in stabilising operational costs and processes through efficiency initiatives, and to drive improvements in customer engagement to enhance the overall delivery of network services, while establishing the technology platforms suitable for industry transitions.

Evoenergy is forecasting Non-network ICT expenditure to be approximately 11.2 per cent of the total net capital expenditure in the 2019-24 regulatory control period. This is a reduction from 17 per cent of total net capital expenditure in the 2014-19 regulatory control period. Further analysis of the actual expenditure in the current 2014-19 regulatory control period is provided in Section 8 of this document.

For comparison purposes, the following chart illustrates total ICT capex spent or forecast in the current and immediate past regulatory control periods along with the forecast ICT capex for the next regulatory control period:



ICT capital expenditure – historical and forecast

As can be seen in the chart above, following a period of relatively low investment in ICT capex in the first three years of the 2009-14 regulatory control period, ActewAGL initiated a number of major projects under the Core Systems Replacement Program (CSRP) and Operational Systems Replacement Program (OSRP) to refresh and maintain its core technology platforms in the last two years of the 2009-14 regulatory control period and throughout the 2014-19 regulatory control period. The majority of the ICT capex forecast for the 2019-24 regulatory control period will be used to upgrade and/or replace existing ICT assets.

Evoenergy and ActewAGL have defined key business themes to enable their mission statement and core principles. These are outlined in a series of principles to assess potential investments in ICT. Evoenergy's planned ICT expenditures have been mapped to both the key business themes as well as the ICT investment principles to ensure alignment with organisational goals.

Robust processes are in place to govern Evoenergy's and ActewAGL's ICT projects. For ICT projects which are specifically structured to support Evoenergy's electricity network business, governance is in accordance with Evoenergy's standard network business-as-usual governance process. ICT projects which are managed by ActewAGL Corporate, a division of ActewAGL Distribution as part of the enterprise-wide corporate services model, are governed following a specific ActewAGL ICT governance process.

The breakdown of the proposed non-network ICT capital expenditure by AER expenditure purpose is summarised as follows:

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT capital expenditure by AER expenditure purpose	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
ICT Asset Extensions	--	\$850	\$1,116	--	--	\$1,966
ICT Asset Remediation	--	--	--	--	--	--
ICT Asset Replacement	\$2,509	\$2,822	\$14,737	\$13,154	\$2,987	\$36,209
ICT Capability Growth	--	--	--	--	--	--
Total Expenditure	\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175

2.0 Introduction

- *Evoenergy is the brand name for the Energy Networks division of ActewAGL which provides electricity distribution services in the ACT.*
- *The purpose of this document is to articulate and justify Evoenergy's planned expenditure of \$38.175 Million for Non-network ICT Systems in the 2019-24 Regulatory Control Period.*

2.1 Corporate overview

ActewAGL Joint Venture (JV) was set up in October 2000 when the Australian Gas Light Company (AGL) and Icon Water Limited (formerly ACTEW Corporation), an ACT Government owned corporation, entered into Australia's first utility joint venture. The ActewAGL JV is made up of two partnerships: ActewAGL Retail, which is owned equally by Icon Water Limited and AGL Energy Ltd via subsidiary companies; and ActewAGL Distribution, which is owned equally by Icon Water Limited and Jemena Ltd via subsidiary companies.

On 1 January 2018, the Energy Networks division of ActewAGL Distribution was rebranded to Evoenergy to comply with the AER's revised ring fencing guidelines. Evoenergy supplies electricity network services to customers in the ACT. This includes:

- Conducting all maintenance, upgrade, and extension work on the distribution and transmission networks;
- Performing connection, alterations, disconnection and reconnection;
- Providing emergency response;
- Maintaining quality and reliability of supply; and
- Reading and maintaining meters (where these meters are owned by Evoenergy).

The ActewAGL brand is still used by the ActewAGL Retail partnership for electricity and gas retail customers in the Australian Capital Territory (ACT) and New South Wales (NSW). The Corporate Services division of ActewAGL Distribution has also retained the ActewAGL brand. Corporate services such as Human Resources, Finance, Procurement and Information and Communications Technology (ICT) are provided to Evoenergy, Icon Water and ActewAGL Retail by ActewAGL Corporate Services.

2.2 Purpose

This document describes and justifies Evoenergy's forecast for non-network ICT capital expenditure for standard control services for the 2019-24 regulatory control period and demonstrates how Evoenergy's ICT forecast capital expenditure meets the objectives, criteria and factors set out in the National Electricity Rules (NER).

2.3 Scope

The scope of this document includes the capital expenditure for Evoenergy's share of enterprise-wide ICT assets along with Evoenergy-specific ICT assets including capital expenditure relating to operational technology (OT) assets such as the Advanced Distribution Management System (ADMS). The proposed expenditure addresses programs and projects required to support the

existing ICT assets needed to support Evoenergy including those required to enable future corporate business needs.

Unless otherwise stated, the expenditure presented in this document is in real FY 2018/19 dollars.

As discussed above, ActewAGL Corporate Services provides ICT services to Evoenergy, and as such many of the projects and/or programs, and associated ICT capital costs, are managed at an enterprise level for multiple business units. Unless otherwise indicated, all costs shown in this document have been adjusted to reflect only the portion allocated to Evoenergy.

2.4 ICT capital expenditure overview

Evoenergy has forecast a non-network ICT capital expenditure of **\$38.175 million** to deliver a prudent program to provide the required ICT assets to achieve the objectives and obligations as a distribution network services provider (DNSP) in the efficient delivery of reliable, secure and sustainable supply of network services to all stakeholders.

In accordance with AER requirements, Evoenergy has grouped non-network ICT capital expenditure by purpose into the four categories listed below:

ICT capital expenditure purpose	Definition
ICT Asset Extensions	The extension of existing ICT assets to broaden their functionality.
ICT Asset Remediation	The correction or optimisation of the performance of existing ICT assets that are not performing to the required service performance requirement.
ICT Asset Replacement	The replacement of an existing ICT asset with its modern equivalent where the asset has reached the end of its economic life. This capex has a primary driver of replacement if the factor determining the expenditure is the existing ICT asset has an inability to efficiently maintain its service performance requirement.
ICT Capability Growth	The acquisition, development and implementation of new ICT assets to meet a business purpose or capacity requirement.

The breakdown of the proposed non-network ICT capital expenditure by purpose is summarised as follows:

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT capital expenditure by purpose	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
ICT Asset Extensions	--	\$850	\$1,116	--	--	\$1,966
ICT Asset Remediation	--	--	--	--	--	--
ICT Asset Replacement	\$2,509	\$2,822	\$14,737	\$13,154	\$2,987	\$36,209

ICT capital expenditure by purpose	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
ICT Capability Growth	--	--	--	--	--	--
Total Expenditure	\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175

As can be seen in the table above, the majority of the proposed spend (approximately 95 per cent) is forecast for ICT Asset Replacement. Several of Evoenergy's and ActewAGL's major ICT and Network Control systems are at or near the end of their economic life and require major upgrade or replacement to efficiently maintain their service performance requirements. The ICT Expenditure breakdown by year and category are as shown in the table below:

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT capital expenditure	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
Network Asset Information Systems	\$2,248	\$2,225	\$14,476	\$12,704	\$2,952	\$34,635
Corporate IT & Communication Systems	\$261	\$1,417	\$1,377	\$450	\$35	\$3,540
Total Expenditure	\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175

The proposed projects and programs of work are consistent with the strategic directions and objectives set out in ActewAGL's ICT Strategy and align to ActewAGL's and Evoenergy's corporate vision, business strategy and goals (see Section 5 of this document).

Evoenergy is forecasting Non-network ICT, capital expenditure to be approximately 11.2 per cent of the total net capital expenditure in the 2019-24 regulatory control period.

The following table provides a yearly breakdown of the Non-network ICT, expenditure as a percentage of the total net capital expenditure for the 2019-24 regulatory control period (RCP).

Evoenergy forecast expenditure	Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
Non-network ICT, Expenditure	\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175
Total net capital expenditure	\$63,500	\$79,900	\$68,700	\$65,400	\$63,600	\$341,100
Non-network ICT as a percentage of total net capital expenditure	4.0%	4.6%	23.1%	20.1%	4.7%	11.2%

In the 2014-19 regulatory period, expenditure on Non-network ICT in the AER's final decision was 7.3 per cent of total net capital expenditure. Actual expenditure and forecast expenditure through

the end of the 2014-19 regulatory control period indicates that Non-network ICT expenditure will be 16.6 per cent of total net capital expenditure.

One of the primary reasons for the increase in both the 2009-14 and 2014-19 periods for Non-network ICT expenditure as a share of total net capital expenditure is the large decrease in the network expenditure for both replacement and augmentation capital. Evoenergy has prudently avoided investing in large capacity increases that may not be needed in the future due to industry changes driven by technological advances such as renewable generation. This has resulted in a larger percentage of the total net capital expenditure being allocated to Non-network ICT expenditure.

But absolute growth in these expenditure categories is also due to the need to rapidly adapt to industry changes and the new DER paradigm to ensure that Evoenergy continues to meet the long term needs of customers.

2.5 Structure

This document is structured as follows:

- **Section 3** provides general electricity industry and technology trends to provide background and context for the forecast ICT expenditure
- **Section 4** describes the investment context for Evoenergy's ICT investments and overviews of both Evoenergy and ActewAGL's ICT governance models
- **Section 5** describes the strategic alignment to Evoenergy's strategic themes and core principles
- **Section 6** describes Evoenergy's and ActewAGL's Application Architecture
- **Section 7** describes Evoenergy's planned ICT expenditure for the next regulatory control period
- **Section 8** provides an overview of the current regulatory period reconciliation of ICT expenditure

3.0 Industry trends

- *The electricity industry is in the midst of rapid change and evolution due to increasing consumer demands and expectations as well as disruptive technology.*
- *Changes to technology in general are also affecting how businesses provide their services, particularly to end-use consumers.*

This section describes general electricity industry and technology trends to provide background and context for the forecast ICT expenditure.

3.1 Electricity industry trends

All electricity network businesses in Australia are at a turning point with the rapid changes in the composition of the energy system driven by changing customer behaviour, energy efficiency, shifts from centralised to decentralised generation / storage, pressure on consumer pricing and a move to decarbonise the energy chain.

Evoenergy must conceptually transition from being a Distribution Network Service Provider (DNSP) to being a Distribution System Operator (DSO). That is, rather than simply receiving power from the transmission network service provider and distributing it to customers, Evoenergy will need to oversee a system of intelligent networks with controllable distributed energy resources and loads. As a DSO, Evoenergy would still undertake the conventional role of a distribution network owner but would also make full use of 'smart' techniques to create additional value for the end customer.

Historically the distribution network has been constructed for energy flows from the generators, through transmission and distribution systems, to customers. Already, distributed energy resources such as solar photovoltaic (PV) arrays, batteries, wind farms and embedded generators within the distribution system are causing more complex two way energy flows that will have serious long-term technical implications for the traditional electrical distribution business and its operating model.

This will require a focus on maintaining value for money for the end customer by continuing efficiency improvements, refining asset management practices, refining Network operational practices and optimising operational and capital expenditure to suit the new business environment.

Distributed energy resources will provide both benefits and incur operational challenges on Evoenergy that will need to be addressed in order to transition to this new paradigm in the operation of the distribution network. It means that Evoenergy will need to be more aware of the energy flows within its systems and transform from a passive to an active real time network operator.

There is an imperative to enhance the understanding of customers and their requirements from the ground up, and how this affects Evoenergy and its network assets. Essentially this means that Evoenergy needs to have greater engagement with customers, understand their evolving expectations and become a more customer-centric organisation that will deliver industry best practice customer and network services.

Evoenergy's strategic objective is to provide network services that anticipate and guide customers' evolving requirements at the lowest cost through the forthcoming uncertain energy consumption trends.

A prime requirement for the successful implementation of Evoenergy's strategy will be a flexible and comprehensive technology strategy and implementation program that underpins the transition process. This will mean enhancing the existing ICT systems, increasing their internal utilisation for all business-as-usual processes and the development and integration of any identified new systems.

This will require an integrated system of distributed grid intelligence and control tools, network planning models, and network operation mechanisms. This will allow real time monitoring and control at lower voltage levels, greater network visibility, and information systems that can handle the amount of data required. Such enhanced capabilities also creates new opportunities in network optimisation across different distributed electricity sources. The result is a high level of utilisation of connected devices which maximises the benefit of network assets, and minimising the need for further augmentation to support higher peak loads.

Another requirement will be the enhancement of machine learning and business intelligence capabilities that will be needed to support the business transition.

3.2 General technology trends

Today's businesses have an increasing appetite for change and process innovation and the consumerisation and ubiquity of technology has shifted expectations on what can be achieved by technology. These expectations have been matched to unprecedented access to enabling technologies that result in significant disruption to the status quo.

In this new world of technology disruption, solution providers are pushing out enabling technologies while business leaders are pulling them in – to increase their agility, improve customer experience, innovate business processes, and leverage increasing amounts of data.

The explosion of data has expanded the computing, storage, and analytical needs of enterprise ICT. Faced with these developments, ICT departments are struggling to match capacity with demand, often implementing disparate technologies to support their needs. Though these issues can be addressed through other means, cloud-based solutions will continue to provide increased opportunities to provide enhanced efficiencies through fluid scaling of capacity, reduced capital investments, and quick-to-deploy capabilities. The appeal of cloud solutions is the speed with which teams can begin leveraging data as opposed to building infrastructure.

In short, the convergence of business and technology is driving new ways of acquiring and implementing technology-enabled business solutions. To be successful, businesses need to collaborate with ICT to understand and leverage these technologies to achieve strategic goals and objectives. Today's market leaders recognise that the mobile enablement of processes and technologies is not just a vehicle for innovation but a necessity for business relevance.

Evoenergy and ActewAGL have identified that the following technology trends are currently impacting their business or are expected to do so in the near future and have the potential to improve the value proposition to the end customer:

- Cloud solutions which provide opportunities to reduce costs while increasing agility,
- Mobile, location and context aware technologies which create new opportunities for customer engagement and productivity gains,
- An ever-growing need for security relating to technologies to proactively monitor, detect and protect critical network operations, business processes and information,
- Rapidly declining storage costs and improvements in processing enable cost-effective big data and analytics platforms,

- Digital Metering Infrastructure and Network IoT which is expected to provide richer, more granular data,
- Artificial intelligence and machine learning enabling automation and self-healing systems as well as the deployment of predictive maintenance systems,
- Business intelligence capabilities to improve planning, the ability of Evoenergy to dynamically reconfigure the Network to meet customer needs, through enhanced trend analysis, planning and decision making,
- Increases in automation of business processes and workflows to increase productivity, and
- Allow for a more seamless integration between operational activities and the back office and corporate support functions.

4.0 Investment context

- *Following a period of low investment in ICT Capex during the 2009-14 regulatory control period, Evoenergy has completed a number of major programs in the current 2014-19 regulatory control period to refresh and maintain its core technology platforms.*
- *For the 2019-24 regulatory control period, Evoenergy will focus ICT expenditure on supporting the network business to rapidly respond to electricity industry changes.*
- *Evoenergy and ActewAGL have also outlined its principles to assess potential investments in ICT.*
- *Evoenergy has robust processes in place to forecast and govern ICT expenditure using prudent and cost-effective methods.*

4.1 Key components of Evoenergy's business strategy

Evoenergy has identified three distinct components to its business strategy – Stabilise, Drive and Thrive. The role of technology and the outcomes sought from these three components is summarised in the table below:

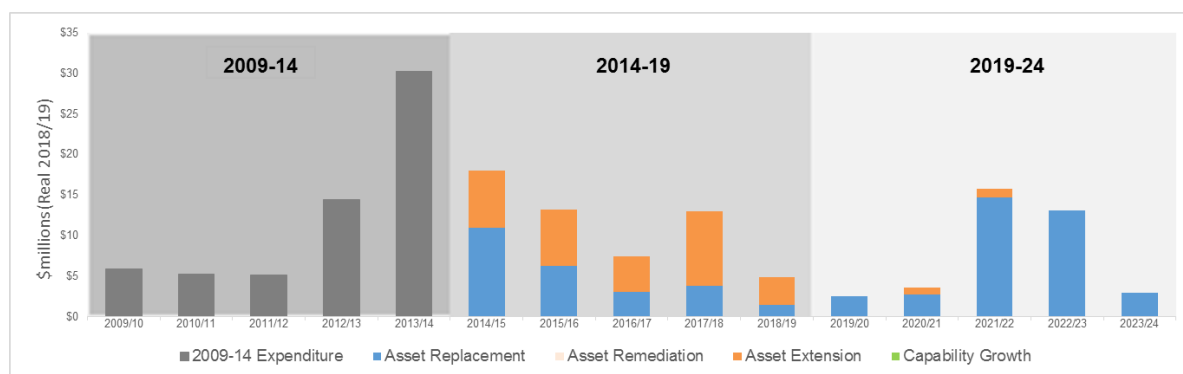
Stabilise	Drive	Thrive
End to end governance, management and visibility of processes for Standard Control Services.	Enhance contacts and experience of existing and new customer (complete customer lifecycle) and community engagement.	Enhance delivery of network services, including standard control and alternative control services.

	Stabilise	Drive	Thrive
Business Strategy	<ul style="list-style-type: none"> • Improve governance and management of processes to ensure that full end to end processes are visible to all stakeholders. • Unlock the benefits of existing data and ICT systems that have been installed. • Improved access to timely, customised and correct information by field workers and management. • Improved management of assets including predictive fault detection and 24/7 management and response. 	<ul style="list-style-type: none"> • Customer and Community Engagement to enhance network services and responsiveness to customers expectations • Using new sources of customer data (smart meters, aggregators) to adjust pricing, better utilise assets, dynamically manage localised peak demand, inform demand forecasting, network capacity planning and opportunities 	<ul style="list-style-type: none"> • B2B and B2C customer contacts and lifecycle management for network and standard control services • Improvement in logistics, supply chain and works management to accommodate works on assets maintenance and development.
ICT Requirements	<p>Efficiency Initiatives</p> <ul style="list-style-type: none"> • Increased automation, including automated decision making enabling 24/7 responses and improved response times • Increased use of predictive analytics for fault detection and prevention • Streamlining of field worker processes and procedures including mobile, real time access to reduce error rates and improve safety 	<p>Improve Customer Engagement</p> <ul style="list-style-type: none"> • Integrate smart metering data and demand aggregators into other real time data streams • Expose services in the OT platform externally <p>Improved use of information to drive decision making</p> <ul style="list-style-type: none"> • Increased use of integrated information from multiple sources across the business. • Leverage time of day and location geo-spatially-based intelligence 	<p>Enhance delivery of network services</p> <ul style="list-style-type: none"> • Identification and contact data of network services consumers • Information for specific onsite installation requirements

	Stabilise	Drive	Thrive
ICT Direction	<ul style="list-style-type: none"> • Reduced cost to serve • Enable efficient field operations via mobile solutions and analytics • Harmonised operational and back office processes across the business • Removal of work around tasks and manual processes by process automation and integration 	<ul style="list-style-type: none"> • Improved systems integration and information management, in particular between operational activities and corporate support. • Information availability across applications and lines of business. • Analytics and decision support capability 	<ul style="list-style-type: none"> • Improved information accessibility and systems flexibility and agility

4.2 ICT capital expenditure trend

The following chart illustrates total ICT capital expenditure spent or forecast in the current and immediate past regulatory control periods along with the forecast ICT capital expenditure for the 2019-24 regulatory control period. The bar segments in the chart represent total ICT capital expenditure categorised by AER expenditure purpose (ICT Asset Extension, ICT Asset Replacement, ICT Asset Remediation, and Capability Growth). See Section 2 for further information on these categorisations:



ICT capital expenditure – historical and forecast

As can be seen in the chart above, following a period of low investment in ICT in the first three years of the 2009-14 regulatory control period, Evoenergy initiated a number of major programs to refresh and maintain its core technology platforms in the last two years of the period. These major ICT programs included major financial investments in the Core System Replacement Program and the Operational System Replacement Program. Additionally during this period and the initial three years of the 2014-19 regulatory control period, Evoenergy implemented changes to technology systems required to allow the network business to maintain compliance with regulatory and industry changes, such as the Power of Choice reforms, the National Energy Customer Framework, and ring fencing as well as increasing level of capability in cyber security and Environmental Health Safety and Quality (EHSQ) systems.

Over the last two years of the 2014-19 regulatory control period, Evoenergy is commencing a series of IT asset extension programs. The main purpose of these ICT programs is to expand

several core ICT systems and the corresponding platforms and hardware. Evoenergy will apply prudent expenditure management considerations when extending these system capabilities.

Evoenergy recognises its needs as a DNSP to develop the necessary technology capabilities in line with the future directions of the industry and to support the business in meeting the expectations of its customers, stakeholders, regulators and the community. As such, much of the ICT capital expenditure forecast for the 2019-24 regulatory control period will be used to upgrade and/or replace the existing ICT assets.

4.3 ICT investment principles

Evoenergy and ActewAGL use the following principles to guide investment decisions, ensuring that a single, integrated operational platform is utilised to support organisational activities:

Principle 1: In support applications

ICT systems are maintained to ensure they remain in support with the respective vendor. The cost to maintain applications increases when the application is out of support. In addition, when an out of support application is utilised, it can have ramifications on the ability to update other applications or hardware, which can lead to cyber security risks.

Principle 2: Geospatially-centric

Given the geographically dispersed nature of electricity distribution, a geospatially-centric operational platform provides an effective method for tracking geographically distributed assets, customers and service deliverables. A geospatial operational environment also enables location intelligence and network connectivity to be accurately maintained, providing end-to-end visibility and dynamic real time optimisation of the distribution network.

Principle 3: Commercial Off-the-Shelf (COTS) and minimal customisation / development

The utilisation of COTS products is driven by an aim to minimise ongoing operational requirements/resources for system maintenance and support, while also providing flexibility for future system upgrades. Where possible, business processes are aligned to COTS solutions, rather than customising software to meet existing business practices and processes.

Principle 4: Consolidated, effective and integrated systems

Ensuring there is only one source of truth for a particular data set is integral to the maintenance of network and business data. Appropriate levels of systems integration provide productivity improvements such as efficient planning through increased visibility, reduced double handling, more control and automated processes across operational and corporate activities.

Principle 5: Appropriate infrastructure

Utilising cloud infrastructure provides a number of benefits including high levels of transparency, dynamic provisioning of ICT infrastructure, scalability, heightened business continuity, high availability and cost containment, however it is essential that formal assessments are undertaken to ensure that cloud is appropriate for specific applications.

Principle 6: Customer centric

Evoenergy seeks to understand and reflect the needs of its customers, therefore it is essential to ensure that all strategies, capabilities and processes are customer-centric.

Principle 7: Mobility

Evoenergy expects to increase efficiency by improving access to and visibility of information and reducing multi-handling of data. Benefits will be driven by the extent to which information can be collected, shared and used anytime and anywhere

Principle 8: Enhanced Communications

An end-to-end real time view of Evoenergy's network, operations and customers requires large volumes of data to be transferred between the various systems and sensors in the ICT environment.

Principle 9: Data enablement

Evoenergy increasingly needs to leverage data in order to perform its role efficiently. Data must be accessible, actionable and visible, and needs to be consistent across the organisation.

Principle 10: Robust Investment Analysis

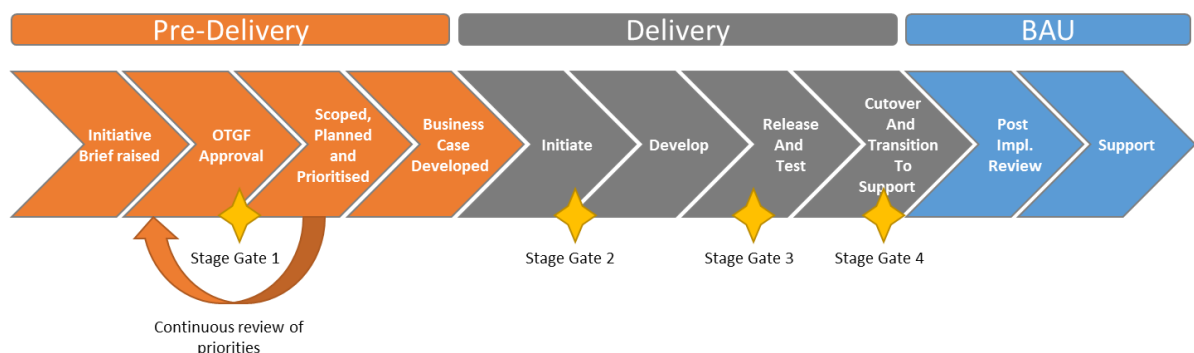
All material ICT system projects must be supported by a robust business case with rigorous investment analysis incorporating options analysis, detailed cost estimates, investment evaluation metrics (NPV, IRR and payback periods), risk mitigation strategies, a practical implementation timetable and milestone gateways.

4.4 Evoenergy and ActewAGL ICT governance processes

Evoenergy and ActewAGL use two distinct governance processes for ICT projects. For ICT projects which are specifically structured to support Evoenergy's electricity network business, governance is in accordance with Evoenergy's standard network business-as-usual governance process. ICT Projects which are managed by ActewAGL as part of the enterprise-wide corporate services structure, are governed following a specific ActewAGL ICT governance process. The two distinct processes are tailored to the demands of each business and importantly ensure continuity of governance processes during a period of significant business transformation. Further details of each of these processes are provided in the following sections.

4.4.1 Evoenergy specific ICT governance process

ICT projects included in this regulatory submission which are specific to Evoenergy will proceed through the network's business-as-usual governance processes, including approvals, prioritisation and delivery. An overview of the process and key stage gates are illustrated in the following figure:



ICT Governance for Evoenergy-specific ICT projects

Each of the stage gates are explained below:

Stage Gate 1

The first stage gate requests approval from the Operational Technology Governance Forum (OTGF). The membership of the OTGF comprises the Asset Information System Manager, Asset Information System Program Manager, Branch Managers for Evoenergy and the Networks Commercial Manager, and is chaired by the General Manager Energy Networks. The group meets

once a month and ratifies that all Initiative Briefs align with the business direction. At this stage the business problem has been defined but the solution has not been determined for the larger projects. The OTGF also continuously review the plan on a page illustrating priorities and timeframes for the approved projects.

Stage Gate 2

The second stage gate occurs for projects that are not regular releases, and is the business case approval. The business case provides the options analysis and requests approval for the recommended option and cost.

Stage Gate 3

The release and test phase of the delivery of the project is concluded with stage gate three. This stage gate includes the Go/No-Go decision, Design Authority approval and Change Advisory Approval, and represents approval of the technical design, testing and deployment plan.

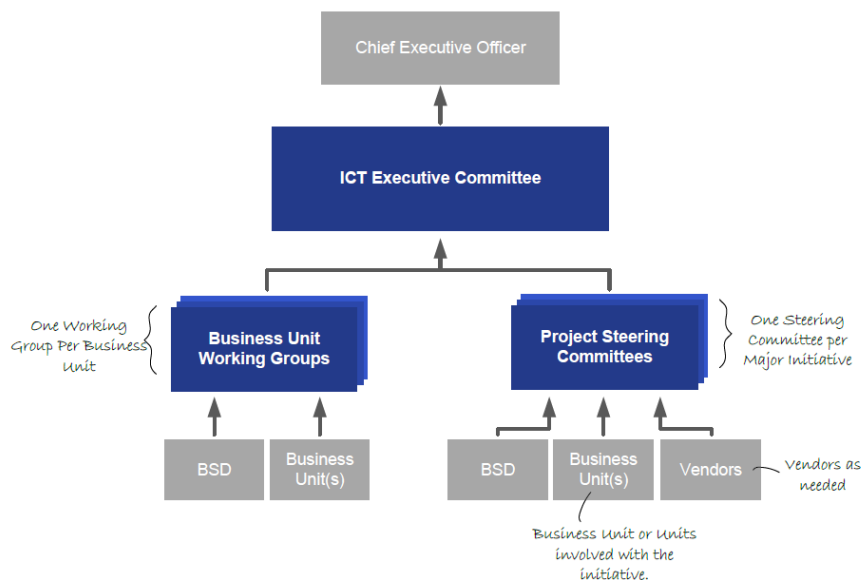
Stage Gate 4

The final stage allows for the closure of the project and ensures that the project has transitioned to support and all required documentation is complete.

Following go-live of the project, a post-implementation review (PIR) is prepared to document lessons learnt to facilitate continuous improvement for future ICT projects.

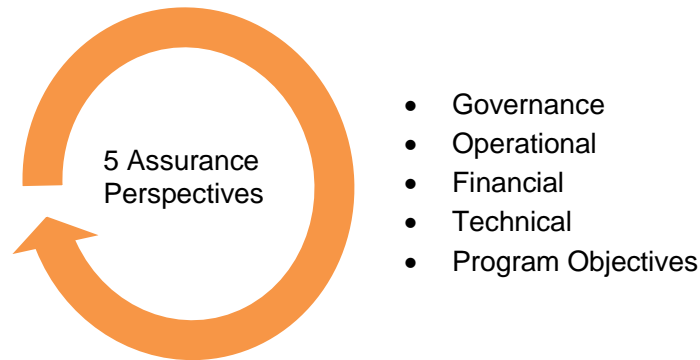
4.4.2 ActewAGL ICT governance process

The ActewAGL ICT governance structure, depicted in the diagram below, is designed to provide a basis to manage and deliver ICT solutions, particularly those that are intended to be used enterprise-wide. The governance structure is intended to reduce complexity in decision making, whilst putting in place the necessary controls to reduce ICT risk.



This governance arrangement serves a dual purpose of setting the future direction of ICT and resolving issues that may arise from business as usual operations as well as monitoring and overseeing the delivery of major ICT initiatives.

ActewAGL has a number of safeguards in place for the assurance of ICT investment. The five assurance perspectives below are broadly applicable to transformation projects (whether ICT-centric or otherwise) and are designed to cover the program lifecycle from initiation to go live and subsequent implementation support.



Assurance perspective	Perspective overview
Governance	Tracking that the appropriate program controls and governance framework are in place and effective.
Operational	Tracking that the appropriate business process changes are being addressed and that user needs are being met. Also includes change tracking of change management efforts.
Financial	Tracking that the processes adopted to manage program costs are robust and accurate.
Technical	Tracking that the solution is technically appropriate – translation of business needs into working technical solutions and includes Design Authority review and approval.
Program objectives	Tracking that the project remains viable and in line with core objectives.

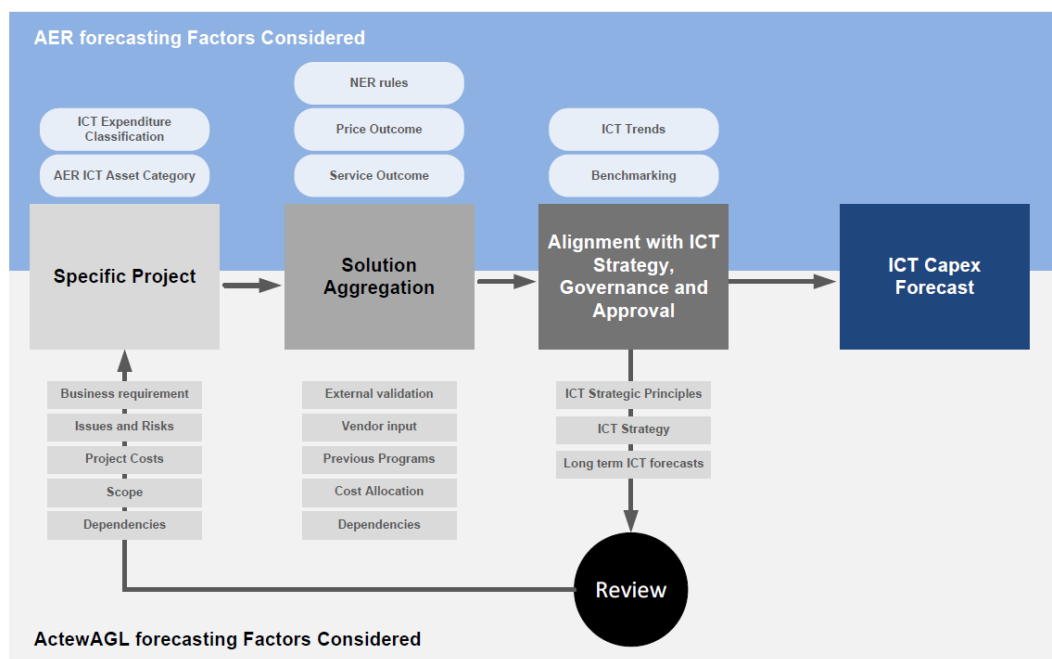
4.5 Forecasting methodology

Evoenergy and ActewAGL use a three-step approach to forecasting ICT capital expenditure:

- **Step 1 – Specific project** - Various estimation processes and methodologies are employed for developing ICT forecasts at the project level for specific ICT solutions.
- **Step 2 – Solution aggregation** – The specific project forecasts are consolidated as applicable to generate value for money to the customer by optimising the capital investment and minimising future operating expenditure requirements while ensuring that programs of work are cost effective and at scale.

- **Step 3 – Alignment and governance** – ICT initiatives are reviewed to ensure that they align with the broader ICT strategy as well as broader organisational business strategies. The ICT capital expenditure is also reviewed and refined by Evoenergy and ActewAGL management prior to inclusion in the regulatory proposal submitted to the AER.

This overall process is shown in the following diagram:



Evoenergy and ActewAGL ICT Capital Expenditure Forecasting Method

Further details on each of the steps are provided below:

4.5.1 Specific project estimates

The forecasting of specific ICT projects is centred on business requirements, ICT asset useful life assessment and any specific regulatory requirements. Individual project estimates adopt a business case approach to capital forecasts using Evoenergy's or ActewAGL's standard ICT business case template as applicable. These standard ICT business case templates include an assessment of each of the following:

- Strategic context,
- Current situation and options,
- Issues and risks (including risk mitigation),
- Investment options and recommendation,
- Scope of recommended investment,
- Benefits of recommended investment,
- Issues and risks addressed,
- Project timetable and approvals,
- Economic benefits,
- Costs of the investment (capital and operational expenditure),

- Cash flow analysis, and
- Dependencies.

4.5.2 Solution aggregation

Aggregation of specific projects into solution and/or program level components begins to develop a comprehensive capital expenditure forecast. This is done to ensure that business requirements of the ICT investment are met and that maximum benefit is obtained from the investment. The aggregation of investments ensures the efficient allocation of capital expenditure.

Evoenergy undertook an iterative process of refining the forecasts provided at the solution level, using among other things:

- Independent verification of the expenditure forecasting methodology, assumptions and cost inputs
- Analysis of historical and ICT trends on emerging technologies, and
- Assessment of previous ICT projects.

These techniques allow Evoenergy to internally scrutinise ICT expenditure into solution level forecasts.

4.5.3 Alignment and governance

As discussed earlier in this section, Evoenergy has adopted a gated approach to its ICT investment governance process. The ICT strategy and ICT principles are applied to investment cases which provides alignment and facilitates a feedback loop between the plans and input forecasts and the annual forecast budgets, while also continuously testing the rigour of business cases for ICT investment.

Uncertainty is reduced over time as proposed investments and business cases pass through governance gates where the need is re-assessed, assumptions are replaced or re-tested, and estimates updated with current unit rates. This process results in an ongoing testing of the prudence and efficiency of any investment and the overall budgets.

5.0 Strategic alignment

- *Evoenergy and ActewAGL have defined a strategic approach that is aligned with the ENA/CSIRO Electricity Network Transformation Roadmap.*
- *Evoenergy's planned ICT expenditures have been mapped to the objectives outlined in the strategic approach.*

5.1 Mission statement and core principles

Evoenergy's (and ActewAGL's) Mission Statement is "To offer our customers the safe, reliable and sustainable energy solutions they want".

The core principles that underpin this statement are as follows:

- Always give first priority to the safety of our staff and customers,
- Recognise that it's all about the customer,
- Deliver great user experiences – tailored and seamless,
- Create solutions that give our customers choice and control,
- Take opportunities and informed risks, and innovate based on knowing our customer,
- Accept that we now operate in a highly contestable and competitive world, and
- Support our local communities.

5.2 Strategic approach

Evoenergy's strategic objective is to provide network services that meet evolving customer requirements at the lowest cost, and to ensure long-term business viability through uncertain energy consumption trends. To achieve this, the strategic approach is a refocus to:

1. Optimise the investment (augmentation /replacement/ operating expenditures) program

The investment program (augmentation /replacement /operating expenditures) is a critical lever to implement the DSO transition, and to place downward pressure on retail prices. Evoenergy has identified a range of tactics, focussed on an intelligence based program that appropriately manages risk, to refocus the investment program.

2. Operationally streamline asset management and service delivery functions

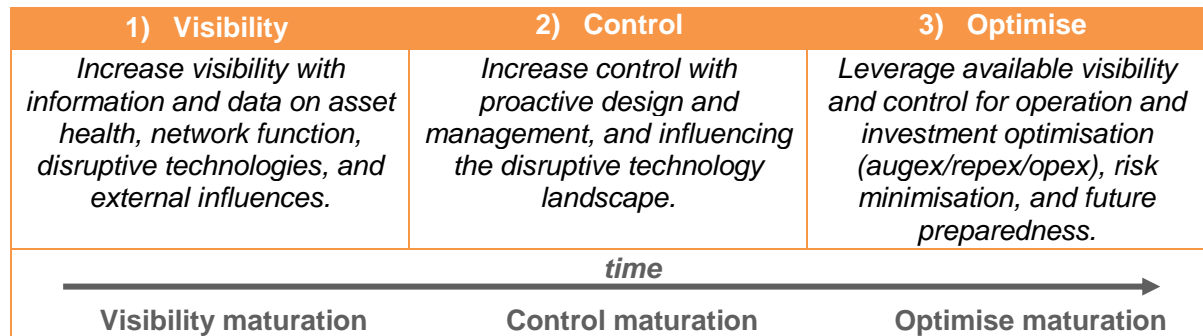
The costs of asset management and service delivery business functions are a key component of Evoenergy's operating expenditure program. As such, increasing the efficiency of these operations is a key lever to place downward pressure on network prices. The approach is to place greater emphasis on cost tracking and financial management, and continue to streamline and drive efficiencies.

3. Implement the conceptual "Distribution System Operator" (DSO) transition

Customers are transitioning from consumers to prosumers, that is, they consume, produce and increasingly store energy. This is coupled with a more active focus generally on managing their demand profile through intelligent control and use of their load, storage and generating capability.

Evoenergy must conceptually transition from a Distribution Network Service Provider (DNSP) to a Distribution System Operator (DSO). That is, rather than simply receiving power from the transmission NSP and distributing it to customers, Evoenergy will oversee a system of intelligent networks with controllable DERs and loads.

The long term strategy to achieve these objectives is:



5.3 Embracing the Electricity Network Transformation Roadmap

The Electricity Network Transformation Roadmap has been developed by Energy Networks Australia (ENA) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and outlines a vision for the future of electricity networks. Evoenergy's strategy and the vision outlined in the Roadmap have been carefully considered so that the actions developed by Evoenergy work to support the future electricity network. The Roadmap provides milestones and actions over the 2017-27 decade to enable the transition to a decentralised, integrated future network.

Forecasts developed in the Roadmap predict that by 2050, up to 50 per cent of electricity will be generated by customers, and, importantly for network utilities, at the grid end (the customer end) of the system. This presents a variety of technical challenges to network businesses as this is not how the network has been designed.

One of the most fundamental changes will be how investment decisions are made. As value shifts from traditional network and generation infrastructure to customer owned distributed energy resources (DER), customers will take a more significant role in deciding how power networks invest. Combined with network investment decisions becoming more uncertain over time, network businesses will need to be certain that investments in long-life infrastructure made in the near term will continue to be prudent in the longer term.

In line with this approach, decisions on investments for IT assets need to take into consideration these anticipated changes to the electricity networks. Technologies that provide greater agility such as cloud computing and "as a service" offerings will provide enhanced flexibility to scale IT capacity up or down as required.

5.4 Alignment of ICT expenditure to strategic approach

The table below identifies how each of the ICT programs align to Evoenergy's strategic approach:

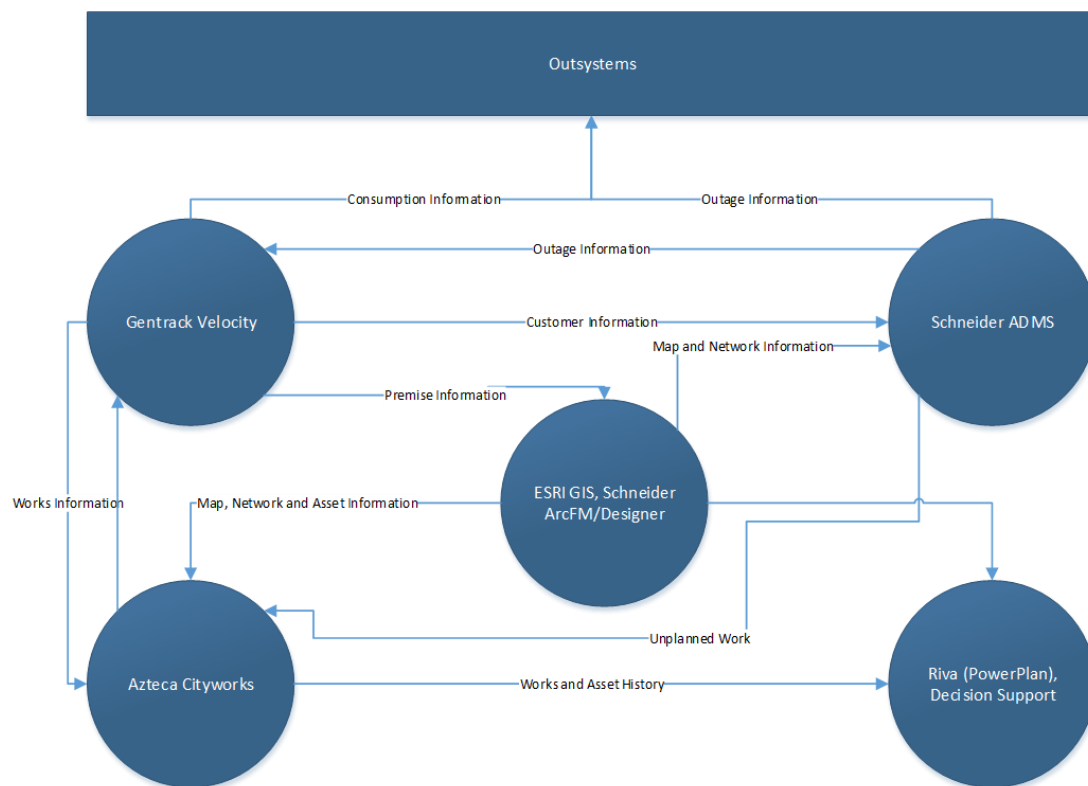
ICT Program	Strategic Approach		
	Optimise the Investment Programme	Streamline asset management and service delivery	Implement the DSO transition
Works and Asset Management	✓	✓	
Meter Data and Billing			✓
GIS		✓	
Riva	✓	✓	
Outsystems		✓	✓
Business Intelligence	✓		
IT Platforms	✓		
Software / Hardware Refresh		✓	
ADMS		✓	✓

6.0 Application architecture

- *This section provides an overview of the current state and the future state core application architecture for Evoenergy.*

6.1 Current state application architecture

Evoenergy's ICT environment consists of core network applications and corporate wide support applications. Evoenergy's core network applications are heavily integrated to create a geospatially centric platform, this is illustrated at a high level in the diagram below. The diagram illustrates the importance of the Geographic Information Systems, and its integral role in the core Evoenergy processes.



Each application is detailed below:

ESRI GEOGRAPHIC INFORMATION SYSTEM (GIS)

The ESRI GIS provides a centralised platform for managing geographically referenced assets and the topology of a connected electrical network. The GIS is utilised by the works management system as well as the advanced distribution management system. The system is therefore integral to managing the network. The application as well as the data within the system must be continuously kept up to date.

SCHNEIDER-ELECTRIC ARCFM/DESIGNER

ArcFM is a utility-specific extension to the ESRI ArcGIS system that provides utilities with a suite of configurable data models as well as sophisticated tools that are critical to effective asset management. By using asset attribute information and enabling end-to-end connectivity, ArcFM provides a single platform for documenting and maintaining the network topology. ArcFM also provides an extensive set of configurable quality assurance and quality control tools to assist in the maintenance of data integrity.

ArcFM Designer is a network design and workflow tool that streamlines the design, estimation and GIS model updates within the ArcFM GIS environment. It enables network augmentation and design works to be completed directly in the GIS.

Evoenergy is currently implementing version 10.2.1c of ArcFM, support of which will be retired by the vendor on 1 May 2022.

SCHNEIDER-ELECTRIC ADVANCED DISTRIBUTION MANAGEMENT SYSTEM (ADMS)

The Schneider-Electric ADMS is a consolidated network modelling system that combines both network operations functionalities with network analysis and simulation capabilities. It provides a single platform for network load modelling and operations management in a real-time environment.

The figure below lists the three core integrated components in ADMS:



The system leverages the network connectivity and topology contained within the GIS and ArcFM to automatically replicate the network model in the ADMS. The ADMS also contains advanced analytics and capabilities for automated control of network apparatus, and offers off-the-shelf AMI integration capability. ADMS out of the box reporting functionality focuses on closed activities, as such, reporting on open outages can be difficult and continues to be a challenge for Evoenergy.

ADMS also provides mobility functionality, currently utilised by field staff on iPads, to provide real time visibility of the network.

The ADMS requires regular upgrades to maintain currency and to take advantage of improvements made by the vendor in areas such as real time reporting.

AZTECA CITYWORKS

Cityworks is a GIS-centric works and asset management system. The Cityworks platform arranges works management and asset condition data by linking it to assets sourced from the GIS, and providing asset history in a geospatial environment. There remains opportunities for Evoenergy to further leverage the geospatial capabilities of Cityworks.

There is a Business need to further leverage the data within Cityworks for other systems. These additional interfaces have not been undertaken due to the difficulties and costs associated with continuing to build point to point integrations. This includes an interface with RIVA which would greatly streamline the process of analysing asset data.

There are a number of processes within Cityworks which are not optimised, triggering the need to conduct a review and options analysis during the 2019-24 regulatory period. The outcome of the review will result in a Cityworks upgrade or system replacement.

RIVA DECISION SUPPORT (DS) (POWERPLAN ASSET DECISION SUPPORT)

RIVA DS is a statistical asset modelling platform that supports long-range forecasts of asset investment needs. It leverages the asset register contained within the GIS/ArcFM as well as asset condition data contained within Cityworks through off-the-shelf integrations. Using this information, it can generate live forecasts synchronised to the operational asset inventory, and generate associated inspections and work orders.

In Evoenergy, each asset is assigned a condition in RIVA. Based on the condition, potential failure modes are identified along with the probability of each failure mode occurring. It also considers the cost of failure (economic, environmental, health and safety, operational and reputational). Asset risk is then calculated as the product of the likelihood of failure and the cost of failure. This risk profile forms the input to the asset management strategy, which in turn is what produces the annual program of work. It supports the development of individual asset specific plans for each asset or asset class and forecasts service level, risk, cost and other performance measures for a given forecast period. However, it does not take a sectionalised view of the network to streamline scheduling or minimise customer outages further along the asset maintenance process.

The lack of integration between Cityworks and RIVA for the program of work continues to create significant scheduling problems, but it is noted that some simultaneous process changes would be required to improve these functions.

It is expected that Riva will be upgraded to version 7 in early 2018 in the current regulatory period with another upgrade in the 2019-24 period. Riva is very adaptable and has system capability to meet the increasing modelling needs of the business. To further enhance asset management, PowerPlan's Capital Planning module may also be implemented in the future.

GENTRACK VELOCITY

Gentrack Velocity is a utility-specific billing and customer relations management tool with market integration capabilities. Gentrack Velocity provides a system for managing the customer relationship when providing services for customer initiated works. Velocity also supports meter and meter data management, referenced to each specific customer's profiles, and offers off-the-shelf capabilities for market settlement.

Velocity has been highly customised to resolve issues and to enhance the functionality of the system to meet the changing needs of the Business with regards to PV requirements. The vendor does not have a clear upgrade roadmap and does not provide regular base functionality updates, with updates focused on backend modules. The vendor has advised that the system will not be out of support, however with customisations increasing this is expected to increase support costs and may make further changes more difficult.

Evoenergy will conduct an options analysis for Velocity to determine whether to continue as is with continual customisations, or to replace the system.

OUTSYSTEMS

OutSystems is a low-code platform used to visually develop applications and integrate with Evoenergy's existing systems. The OutSystems platform enables rapid, agile development, and it sits over the top of the core applications. It is utilised at Evoenergy for the Customer Portal, providing information from core systems in a manner useful to end customers. The system is also utilised internally for data visibility, and a Contractor / Staff portal will be developed in the current regulatory period.

OutSystems is an integral tool at Evoenergy to share information and enhance customer centricity.

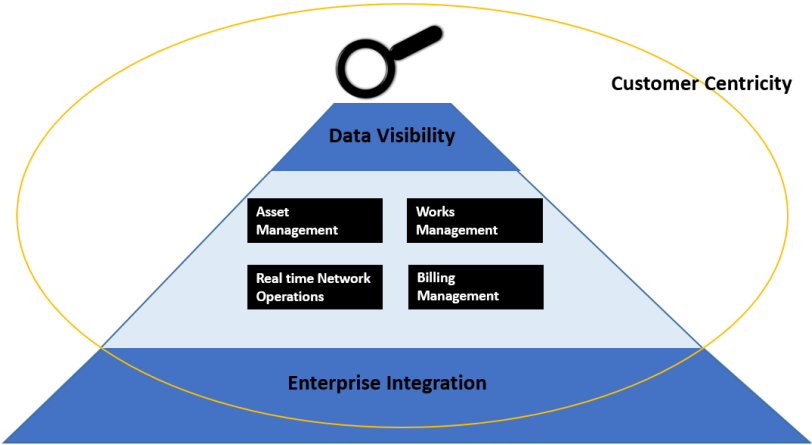
6.2 Future state application architecture

Distributed Energy Resources (DERs) and advancements in digital technologies are changing customers’ expectations in the Utility sector, and therefore the customer relationship. Traditionally, electricity retailers have held the relationship with the customer, however this is likely to change as customers see more benefits arising from interactions with distributors, for example participating in demand response initiatives¹. Evoenergy’s intention is to educate its’ customer base on the opportunities created for them through the sector’s disruption. This will facilitate the creation of partnerships with customers to maximise the value of the grid to the ACT community. This requires data to be visualised in new customer-centric ways instead of the historic asset centric structure used today¹.

The future state of the Evoenergy core applications is focussed on customer centricity, to meet the requirements and drive the changes necessary to meet and exceed these changes in customer expectations. This will be achieved through providing technology that allows for strong customer engagement, cost-effective network and asset management and providing the information that allows customers to be informed and involved in managing their consumption, generation and storage and placing the customer at the centre.

The future state core environment will continue to embody a single, completely integrated, geospatial solution, supported by enterprise integration. The four functional areas will continue to be changed to meet the expected disruption and resulting needs of the customers, and subsequently leveraged by providing greater data visibility.

A high-level representation of the core future state is presented below.



¹ Customer engagement in an era of energy transformation – PWC Global Power & Utilities

7.0 Planned ICT expenditure

- *ICT is evolving at a rapid pace resulting in many opportunities and challenges. Evoenergy is seeking to exploit these opportunities to improve the safety, reliability and affordability of electricity to end-use consumers.*

7.1 Overview

Evoenergy has proposed a set of ICT expenditure programs, in line with industry developments and its key strategies, to actively seek opportunities to deliver network services efficiently to electricity customers, through appropriate technologies and prudent management.

Evoenergy's focus on continuous improvement will ensure that network services are provided through efficient processes that can be updated, streamlined or automated. Many of these improvement opportunities will be enhanced through the use of industry technology solutions. The following table summarises Evoenergy's ICT Expenditure, grouped by expenditure category:

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT capital expenditure		Year 1 FY 19/20	Year 2 FY 20/21	Year 3 FY 21/22	Year 4 FY 22/23	Year 5 FY 23/24	RCP Total
Network Asset Information Systems:							
	Works and Asset Management						
	Meter Data and Billing						
	GIS, ArcFM and Designer						
	Riva DS						
	Outsystems						
	ADMS						
Subtotal							
Corporate IT & Communication Systems:							
	Business Intelligence						
	IT Platforms						
	Hardware & Software Refresh						
Subtotal							
Total Expenditure		\$2,509	\$3,672	\$15,853	\$13,154	\$2,987	\$38,175

Further details for each ICT Program are provided in the following sections of this document.

7.2 Works and asset Management

Evoenergy utilises Azteca Cityworks as the Works and Asset Management System. Cityworks is a customised off-the-shelf product, produced by Azteca, based in America, and supported by gViz in Australia. Cityworks is Geospatially centric, it utilises ESRI's ArcGIS maps to enable enhanced scheduling, and utilises the Schneider ArcFM data model to hold asset maintenance data. The application maintains the linkage between assets and work orders, allowing the history of completed work orders against a specific asset to be easily viewable, retrievable and reported. The geospatial nature of Cityworks also enables the field to view the work allocated to them on a map, providing them with easy access to the work order information.

Cityworks is utilised for a number of critical business functions and processes relating to the completion of program of work related inspections, asset maintenance and replacement activities, as well as customer initiated works. Cityworks is utilised as part of the mobility solution, with access available via airwatch on Evoenergy iPads. As such, the solution is utilised across Evoenergy, from designers and schedulers through to field workers.

7.2.1 Strategic context

Cityworks is the works management tool that enables the annual program of asset maintenance and replacement, and customer initiated works to be packaged and tracked to completion. During the current regulatory period 2014-19 the application was made available on iPads, enabling digitisation of the workforce. The works and asset management system will be integral in continuing the digitisation of the workforce, internal productivity enhancements and therefore overall operational efficiency.

7.2.2 Scope of investment

This investment covers a number of defect releases, and upgrades. Each release includes scoping activities, design and development, test and release, communications, training and transition to BAU activities. The upgrades includes impact analysis on any customisations, new functionality and integrations with other systems. The initiatives by financial year are listed as follows:

- FY 19-20 – Quarterly defect releases
- FY 20-21 – Upgrade
- FY 21-22 - Quarterly defect releases
- FY 22-23 – Upgrade
- FY 23-24 – Quarterly defect releases

The initiatives were identified using an initial bottom-up forecasting approach, and subsequently ratified and reduced using a top-down review. The result ensures there are no releases on the existing system during the year an upgrade occurs.

7.2.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Works and Asset Management						

The Works and Asset Management investments are 100% allocated to Evoenergy.

7.2.4 Benefits

Expected benefits for this investment are:

- Ensure security is maintained. Monthly Microsoft patches are applied to the databases used for the Works and Asset Management system. Microsoft only provides patches for infrastructure in support. Older infrastructure and databases do not have vendor support, cannot take patches, and are often targeted for cyber-attacks. In addition, the vendor continues to make improvements to how robust the system is, to ensure that weaknesses within the application are not taken advantage of.
- Ensure stability is maintained. With the large number of users on the system, it is essential the system does not have regular outages or critical production issues. The system will continue to grow in importance with the digitisation of the business. Where printed work packages were the norm, it was very easy to continue to undertake planned work. Now that printed work packages are no longer used, a critical system failure can very easily result in planned maintenance, replacement or customer jobs being cancelled, since the teams do not have access to critical design information. Job cancellations are a cause of customer frustrations,
- Ensure vendor costs are minimised. Vendors only support a number of old versions, anything beyond this must be negotiated for, and since there is lock-in to one vendor with Cityworks for the majority of works, driving down the cost in these negotiations is difficult,
- Ensure compatibility with updated technologies. Cityworks is a web browser system, as such it must be upgraded to run on new versions of browsers and be able to work when technologies are retired. For example, Silverlight was recently retired by a number of browsers, triggering the need for a Cityworks release,
- Ensure operational efficiencies can be realised. Evoenergy prescribes to continuous business improvement. The technology places restrictions on how much business processes can change, before the technology must also change. Therefore to continue to improve efficiency and accuracy and minimise costs throughout the entire Works and Asset Management process, the technology solution must support it,
- Ensure support costs are minimised. Multiple vendors are currently utilised to ensure satisfactory support, this may be minimised with upgrades or replacement,
- Further digitisation of the workforce through improved mobility applications, and
- Further digitisation of back office processes, reducing double entry, improves data quality and program of work packaging and monitoring.

7.2.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) The forecast capital expenditure is considered necessary to achieve:

6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;

- N/A

6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

- N/A

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> The proposed expenditure seeks to ensure system enhancements for maintaining application currency to remain within vendor support, for the works and asset management functions in the delivery of standard control services through maintenance of Evoenergy assets required to deliver the services, improved ability to respond to service issues through more efficient process leading to faster response times and ability to make more effective local decisions.
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> Proposed option will deliver improved safety through enhanced communication, timely availability of network assets data, field resources and spatial capabilities.

7.2.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) *The forecast capital expenditure reasonably reflects each of the following:*

<p>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</p>	<ul style="list-style-type: none"> The expenditure focuses on delivering specific solutions to address gaps in Evoenergy capabilities in line with industry and enable efficient and optimal operations of Evoenergy's network assets.
<p>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</p>	<ul style="list-style-type: none"> The expenditure has been costed to realistic timelines and scope.
<p>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</p>	<ul style="list-style-type: none"> The expenditure forecast is comparable to realistic upgrade projects implemented in industry, based on Evoenergy's experience with these systems. Evoenergy will ensure competitive market costs through procurement management.

7.3 Meter data and billing

Gentrack Velocity is Evoenergy's central system for billing, market integration and customer relationship management. It also provides a system for managing services for customer initiated works. The application was implemented in 2014 as a replacement for numerous disparate and unsupported systems.

7.3.1 Strategic context

Velocity is Evoenergy's primary source of truth for meter data, billing and customer information and is integral for Evoenergy in meeting regulatory requirements with regards to market transactions and customer notifications of planned outages.

It is imperative that Evoenergy's meter data and billing system is stable and remains flexible to accommodate regulatory changes, while minimising costs. In addition, the application must be able to handle the exponential growth in meter data instigated by the increase in smart meters.

7.3.2 Scope of investment

This investment covers a number of defect releases, implementation of meter data management and one major upgrade or replacement. Each release includes scoping activities, design and development, test and release, communications, training and transition to BAU activities. The major upgrade or replacement has the additional task of conducting a thorough options analysis to identify the best solution for the business prior to delivery. The initiatives by financial year are listed as follows:

- FY 19-20 – Quarterly defect releases,
- FY 20-21 – Bi-annual defect releases
- FY 21-22 – One defect release and commencement of the review and major upgrade or replacement and implementation of meter data management (MDM)
- FY 22-23 – Completion of the major upgrade or replacement and implementation of MDM and one minor defect release
- FY 23-24 – One defect release

7.3.3 Cost of Investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Meter Data and Billing						

The Meter Data and Billing investment is 100% allocated to Evoenergy.

7.3.4 Benefits

Expected benefits for this investment are:

- Ability to handle big data. The exponential growth in meter data, requires an application to be able to process, store and perform with a significant volume of data. The Velocity application has not been built for the volume that is expected, nor for the different types of data and tariffs, which may lead to validations being unable to occur, and multiple compliance issues.
- Ensure security is maintained. Monthly Microsoft patches are applied to the databases used for the Meter Data and Billing system. Microsoft only provides patches for infrastructure in

support. Older infrastructure and databases do not have vendor support, cannot take patches, and are often targeted for cyber-attacks. In addition, the vendor continues to make improvements to how robust the system is, to ensure that weaknesses within the application are not taken advantage of.

- Ensure stability is maintained. Given market processes have a time component associated with them, it is important to ensure the system has high availability, and validation processes run to completion as expected,
- Ensure compatibility with updated technologies. Given the meter data and billing system is a core application for sharing information across other Evoenergy applications and to customers as well as back office practices. It is key that the application keeps up to date with new integration practices, including full APIs. This decreases the cost of future integrations and enables faster and easier information sharing, and
- Ensure compliance is maintained. Without regular releases, any regulatory changes cannot be enabled and built into the meter data and billing application.

7.3.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> • N/A
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> • Evoenergy is expected to perform system changes in its Velocity system in line with any MSATS system changes.
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> • Enhancements to the metering and billing system will enable Evoenergy's application to maintain currency and within vendor support, required to provide a reliable distribution network billing function, of the standard control services of a DNSP.
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> • N/A

7.3.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none">• The expenditure focuses on reducing the complexity and operating expenditure with the current inefficient manual work around and processes required to compensate the deficiencies of the current billing functions, and• Reduces Evoenergy's operational risk profile from current system.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none">• Expenditure forecast for this investment is comparable to similar scope meter data and billing upgrade projects implemented in industry.
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none">• The investment was forecast based on competitive market pricing.

7.4 GIS, ArcFM and Designer

7.4.1 Strategic context

Evoenergy utilises ESRI ArcGIS and Schneider ArcFM along with Schneider ArcFM Designer, an extension of ArcFM to provide network topology, asset register and geospatial information.

The GIS/ArcFM suite of systems is an integral enabler of Evoenergy's operations. The maps and asset register is utilised by the Works and Asset Management system, enabling a source of truth for asset data and geo-centric planning. In addition, this data forms the basis for the Advanced Distribution Management System (ADMS). The accuracy of the data held within the suite of systems impacts efficiencies in the scheduling process, distribution and outage management and effective customer communications related to both outages and access.

The most important aspect of the GIS/ArcFM suite of systems is therefore the quality, availability and accuracy of the data held within the applications. It is essential that the application has a high level of availability, high performance and any defects affecting data quality are quickly identified and resolved to minimise the risk of inaccurate customer letters, minimise risk of safety issues and minimise inaccurate reporting of customers off supply.

7.4.2 Scope of investment

The GIS/ArcFM suite of systems will undergo one major upgrade during the RCP. This upgrade has been identified through the use of the vendors' roadmap to ensure that the application remains current. In addition, regular releases during the RCP are expected to be required as patches are made available by the vendor to remediate issues.

7.4.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
GIS, ArcFM and Designer						

The GIS, ArcFM and Designer implementation investment is 100% allocated to Evoenergy.

7.4.4 Benefits

Expected benefits for this investment are:

- Ensure data can be utilised by the other Evoenergy core applications. Given the GIS/ArcFM role in the Evoenergy operating environment, the ability of the applications to integrate with the other applications is key. Since the other applications will require upgrades during the RCP for various reasons, it is integral that the GIS/ArcFM suite can still integrate with the applications without large volumes of customisations.
- Ensure the GIS application can continue to operate in a cloud environment. The GIS system has recently moved into cloud infrastructure to reduce the total cost of ownership of the application. This approach makes it mandatory for application updates to occur so that it can run on the cloud infrastructure.
- Ensure security is maintained. It is imperative that security related software defects can be resolved, which can only occur on an in support version of the applications.

7.4.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> Not Applicable
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> Not Applicable
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> Proposed expenditure to maintain core systems technical currency supporting delivery of quality and reliability of standard control services. Period systems refresh are in line with industry practices, which mitigate the technology risk (e.g. risk of failure due to failing software or malicious attack exploiting potential vulnerabilities) associated with out of version application environment.
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> Enable Evoenergy to make informed decisions on asset maintenance and operations, including proactive safety operations, based on up to date asset data processes facilitated by technically current application environments.

7.4.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure reasonably reflects each of the following:</i>	
6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none"> The proposal will follow Evoenergy's expenditure governance process taking into consideration of efficient factors, options analysis and consideration of capital vs operating expenditures on the solution that is in line with industry approach.

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

<p>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</p>	<ul style="list-style-type: none"> • Costs considerations to ensure the optimal refreshes will be fit-for-purpose and value-for-money and costed to realistic timelines and scopes; • Where feasible and pragmatic, compare external expenditures on similar functions and technology refreshes.
<p>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</p>	<ul style="list-style-type: none"> • Continued leverage internal and competitive vendor resources, resource rates, including consideration of options to ensure realistic and competitive refresh costs and timing. • Cost forecast and timing based on Evoenergy's experience with these systems.

7.5 Riva DS

7.5.1 Strategic context

Riva Decision Support is a statistical asset modelling platform that supports long-range forecasts of asset investment needs. It leverages the asset register contained within the GIS/ArcFM as well as asset condition data contained within Cityworks through off-the shelf integrations to provide a comprehensive view of Evoenergy's asset health.

The system, using the data from these systems, provides all the information required to build the asset specific management plans. This is utilised in defining the annual program of work based on targeted maintenance schedules and targeted replacements, leading to lower costs for customers and fewer outages due to asset failures.

7.5.2 Scope of investment

The investment into Riva consists of annual minor releases.

7.5.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Riva DS						

The Riva DS investment is 100% allocated to Evoenergy.

7.5.4 Benefits

The expected benefits of this investment are:

- Ensure defects can be resolved. Any defects identified within the application may impact the quality of the program of work, and must be resolved to ensure no unnecessary inspections, maintenance or replacements are added to the Capex program due to them
- Ensure stability is maintained. It is essential that Riva does not have extended outages to ensure that users can access and utilise the system without fear of losing valuable analysis
- Ensure vendor costs are minimised. Vendors only support a number of old versions, anything beyond this must be negotiated, since there is lock in with one vendor, driving down the costs in these negotiations is often not possible
- Ensure security is maintained. Monthly Microsoft patches are applied to the databases used for Riva. Microsoft only provides patches for infrastructure in support. Older infrastructure and databases do not have vendor support, cannot take patches, and are often targeted for cyber-attacks. In addition, the vendor continues to make improvements to how robust the system is, to ensure that weaknesses within the application are not taken advantage of.

7.5.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> The core modelling and analysis technology enable Evoenergy to optimise asset investment planning in meeting ACT's standard control services in energy distribution demand and consumptions.
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> N/A
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> Proposed expenditure to maintain core systems technical currency supporting delivery of quality and reliability of standard control services. Period systems refresh are in line with industry practices, which mitigate the technology risk (e.g. risk of failure due to failing software or malicious attack exploiting potential vulnerabilities) associated with out of version application environment
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> N/A

7.5.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) *The forecast capital expenditure reasonably reflects each of the following:*

6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none"> The proposal will follow Evoenergy's expenditure governance process taking into consideration of efficient factors, options analysis and consideration of capital vs operating expenditures on the solution that is in line with industry approach.
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Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

<p>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</p>	<ul style="list-style-type: none"> • Costs considerations to ensure the optimal refreshes will be fit-for-purpose and value-for-money and costed to realistic timelines and scopes. • Where feasible and pragmatic, compare external expenditures on similar functions and technology refreshes.
<p>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</p>	<ul style="list-style-type: none"> • Continued leverage internal and competitive vendor resources, resource rates, including consideration of options to ensure realistic and competitive refresh costs and timing. • Cost forecast and timing based on Evoenergy's experience with these systems.

7.6 Outsystems

7.6.1 Strategic context

Throughout the current RCP, it became evident through engagements with Evoenergy customers attending the Energy Consumer Reference Council (ECRC), that customers are demanding greater visibility and information in order to have greater control over their energy use. Evoenergy implemented Outsystems, a low code bespoke development tool in 2015 to enable greater sharing and visibility of pertinent data.

The Outsystems platform currently hosts the Evoenergy Customer Portal, a retailer NMI tool and internal tools to drive efficiencies including a load profile tool

The platform will continue to develop into a dynamic method for Evoenergy to engage and respond to end customers. This includes demand response initiatives, transparent end to end request for services status, connections tracking and a single customer view portal for the call-centre. The applications on this platform are intended to become our main customer engagement tool.

7.6.2 Scope of Investment

Outsystems is a rapid development bespoke development tool. Evoenergy utilises agile methodology to respond to customer requirements in a timely manner. A total of \$100,000 has been allocated per year to conduct sprint releases and platform upgrades. Any additional requirements identified by the Business or requested by Customers are required to have benefits that ensure the change pays for itself. In this way scope of releases are minimised and ensures that only prudent changes are made to the application.

7.6.3 Cost of Investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Outsystems						

The Outsystems investment is 100% allocated to Evoenergy.

7.6.4 Benefits

Expected benefits are:

- Increased automation of customer interactions and related processes. In order to gain feedback on proposed portal functionality, engagement with Developers and other key stakeholders was required. This interaction has enabled Evoenergy to identify process improvements to provide additional information to these customers, but also to provide further back end automation to complete work faster, a key theme present in discussions
- Increased visibility of customer initiated works. The existing customer portal will be extended to provide the ability to track requests through the process, providing the customer with more information and visibility of the end to end process
- Ensure compatibility with internet browsers. As existing technology is constantly upgraded not only in the work environments, but also on individuals mobiles and home computers, it is necessary for the customer portal to work well on new browsers to ensure the customer experience does not deteriorate over time,

7.6.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> N/A
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> N/A
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> Proposed expenditure to maintain core systems technical currency supporting delivery of quality and reliability of standard control services. Period systems refresh are in line with industry practices, which mitigate the technology risk (e.g. risk of failure due to failing software or malicious attack exploiting potential vulnerabilities) associated with out of version application environment
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> N/A

7.6.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure reasonably reflects each of the following:</i>	
6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none"> The proposal will follow Evoenergy's expenditure governance process taking into consideration of efficient factors, options analysis and consideration of capital vs operating expenditures on the solution that is in line with industry approach.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none"> Costs considerations to ensure the optimal refreshes will be fit-for-purpose and value-for-money and costed to realistic timelines and scopes.

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

	<ul style="list-style-type: none"> Where feasible and pragmatic, compare external expenditures on similar functions and technology refreshes.
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none"> Continued leverage internal and competitive vendor resources, resource rates, including consideration of options to ensure realistic and competitive refresh costs and timing. Cost forecast and timing based on Evoenergy's experience with these systems.

7.7 ADMS

Advanced Distribution Management System (ADMS) provides electric utilities with leading critical grid management capabilities to improve outage response, optimise evolving grid operation and manage impacts from distributed energy resources. Evoenergy utilises ADMS for DMS, OMS and SCADA capabilities. ADMS utilises the GIS network maps and ArcFM Data Model, mapping both the HV and LV network, enabling visibility to the 'edge of the grid'. This ensures that Evoenergy has the operational capability to the household level without the need for Smart Meters.

ADMS is key in managing planned and unplanned work, identifying and resolving outages, and identifying customers impacted by planned work for notification letters. In addition, the ADMS mobile platform is used via iPads in the field to enable Electrical Operators to have the same information as in the Control Room.

7.7.1 Strategic context

ADMS is integral in enabling Evoenergy in coping and encouraging the industry changes driven by the increase in distributed energy resources. This includes the ability in the future to integrate with strategic partners and initiatives in the ACT including the decentralised energy exchange (deX) and utilise real time data feeds in load flow analysis. This ability will enable Evoenergy to react to and change based on what our customers are doing and the real state of the network.

The ADMS also plays a strategic role in the Evoenergy environment. The ADMS integrates with:

- the ArcFM Data model, this ensure the Control room has visibility of both HV and LV in one system, providing increased fault response and safety,
- Cityworks, enabling reactive work to be automatically tracked via a work order once a fault is confirmed, enabling asset maintenance records to be kept up to date,
- Outsystems, enabling customers to view outages in the ACT on a map in the customer portal,
- Velocity, which is a two way integration, where Velocity provides customer information to ADMS, used to identify customers affected during a planned and unplanned outage. ADMS subsequently creates a customer notification file used by Velocity to generate the notification letters for planned work

In addition, the ADMS enables Evoenergy to provide employees with visibility of the state of the network in real time and ability to move to a paperless mobile environment.

In addition, it plays a core role in the safety of employees and the community, in meeting customer and regulatory expectations with customer notifications. The system will play a key role in monitoring and dispatching DERs on the network and controlling power quality.

Ongoing vendor and internal support are an essential part of software life cycle management and benefits realisation.

7.7.2 Scope of investment

This investment covers a number of defect releases, a minor upgrade and a major upgrade. Each release includes scoping activities, design and development, test and release, communications, training and transition to BAU activities. The initiatives by financial year are listed as follows:

- FY 19-20 – Quarterly releases
- FY 20-21 – Quarterly Releases
- FY 21-22 – Major Upgrade
- FY 22-23 – Quarterly releases

- FY 23-24 – One release and a minor upgrade

7.7.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT Expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
ADMS						

The ADMS investment is 100% allocated to Evoenergy.

7.7.4 Benefits

Expected benefits for this investment are:

- Ability to dynamically interact with other participants. The investment is expected to enable additional point counts from third parties through the increase in methods of deployment and scalability including the ability to use cloud services. In addition, enhanced load flow algorithms for distributed energy resources (DER) and load modelling will enable Evoenergy to leverage the real time data provided from third parties
- Enable dynamic load flow adjustments. The ADMS functionality is continuing to address modelling of DER including energy storage which is not possible to model in the current version. This enables the development of automated DER dispatch functionality in a similar manner to Closed Loop Volt/Var control but for Active as well as Reactive power. This enables further real time optimisation of the network, and the potential to defer the need for augmentation investment.
- Enable greater control of Power Quality. Later versions of the ADMS is expected to optimise Volt, Var and Watt. The version Evoenergy currently utilises only provides Volt and Var optimisation leading to active power resources not being able to be leveraged in controlling network Power Quality
- Ensure security is maintained. Monthly Microsoft patches are applied to the databases used for the ADMS system. Microsoft only provides patches for infrastructure in support. Older infrastructure and databases do not have vendor support, cannot take patches, and are often targeted for cyber-attacks. In addition, the vendor continues to make improvements to how robust the system is, to ensure that weaknesses within the application are not taken advantage of,
- Ensure stability is maintained. With the criticality and safety aspects of the system, it is essential the system does not have regular outages or critical production issues.
- Ensure support costs are minimised. Support costs are likely to increase from the vendor as the system becomes older. In addition, there will be a cost to the Business as more and more requirements are unable to be met by the application, since the vendor may have built the customisation into a newer version and will not amend the functionality for older versions,
- Ensure changes in the Utilities industry can be met. Ensure that changing industry and Business requirements can be fitted to the system, to enable modelling of disruptive technologies, two way power flows, and other disruptive forces, and

- Further digitize the workforce. There will continue to be opportunities to enhance and improve the ADMS mobility platform to further enable works to occur in the field, improving productivity, and data quality.

7.7.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> • N/A
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> • Maintaining ADMS currency supports Evoenergy's compliance with AEMO ICCP connection and network operations in meeting Evoenergy's obligations in regards to outage management and network performance targets, i.e. NECF and SAIFI.
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> • Updating ADMS and ensuring regular releases will ensure that the risk of potential failure and electricity outage in ACT is minimised. This aligns with the objective to maintain the quality, reliability and security of the distribution system or the supply of standard control services.
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> • The proposed capital expenditure seeks to ensure that the continued safe operation of the distribution system and hence the risk of potential failure and/or unplanned electricity outages is reduced.

7.7.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none">• The ADMS investment is in line with the most cost effective means of meeting regulatory requirement of reliable and safe supply.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none">• Costs associated with the ADMS are considered to be prudent and in accordance with the other DNSPs.
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none">• Cost estimates have applied the Evoenergy forecasting methodology and have been validated using vendor provided costings.

7.8 Business intelligence

Business intelligence (BI) is a business capability that can transform raw data into meaningful and useful information to help identify and develop new opportunities for further optimising business efficiency and other value creation. When coupled with artificial intelligence, predictive analytics and machine learning, BI will generate insights into customer behaviour at a granular level, make predictions and recommendations around assets and drive improvements in performance through the automation of processes.

Investments in the large scale and holistic business applications described in this document, will enable the collection of even more data from assets, customers and third parties. BI solutions have come to the fore as an effective business management tool, as it gives businesses the ability to handle large amounts of data, in real time. This will enable Evoenergy to harness the power of data that will be collected on its assets and use of the electricity grid.

BI for Evoenergy will use technologies, processes, and applications to analyse data, providing historical, current and predictive views to support decision making throughout asset lifecycles and better manage and utilise the network.

7.8.1 Strategic Context

Evoenergy, like most modern organisations is facing an increased need to manage the increasing volume of data, from the digitisation of business, customer management and asset management functions. As additional data is available on asset usage, Evoenergy will have access to more and higher quality data than ever before. Business intelligence becomes an essential ICT capability to enable the business in:

- Providing insights into the behaviour of customers at a granular level, using interval meter data to analyse energy consumption and production patterns, which will give Evoenergy the ability to optimise the distribution network to meet customer needs,
- Educating customers to enable them to better manage their own consumption of power,
- Predicting asset failures before they occur, enabling preventative maintenance plans that will replace assets prior to failure, minimising interruptions to energy supply,
- Improving asset utilisation and service reliability and efficient demand management from reliable and high quality field and meter data, and
- Finding new opportunities for continuing to optimise the asset lifecycle and the Network,
- Meeting regulatory and market obligations with increasing reporting details and data accuracy data,
- Delivering services improvements based on outcomes of analysis from business and asset data, and

ActewAGL could continue current practices of building reporting solutions and ad hoc queries to interrogate data from key systems and external data sources to manually analyse the data in order to find answers to key business questions (or to find new questions). This approach, however, is likely to be cumbersome and costly as compared to investment in a formalised BI capability.

Over the past decade, BI has matured as a business concept and its implementation has become significantly less risky (in terms of time and money). ActewAGL is not an early adopter of this technology, and will now enjoy the benefits of a more orderly investment as outlined in this document.

7.8.2 Scope of investment

The BI capability uplift will include:

- Defined approach for analytics and data management,
- Established data foundations to leverage the investments Evoenergy has made in asset, works and Distribution Management Systems, ensuring uniform data definitions used across the board,
- More analytics capabilities and integrations back into core applications including the ADMS (including increased focus of business intelligence, big-data capabilities, optimisation of network analytics capabilities),
- Automation of data extract, transform and load (ETL) processes and automation software that mimics steps of a rules-based, non-subjective process without compromising existing ICT architecture,
- Centralised administration console for controlling, monitoring, executing and scheduling process execution, and
- Logical and visual, code-free configuration of processes following an object oriented approach.

7.8.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT Expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Total Enterprise Capital Expenditure	█	█	█	█	█	█
Amount funded by Evoenergy²	█	█	█	█	█	█

7.8.4 Benefits

Expected benefits for this investment are:

- Analyse demand response patterns to ensure desired outcomes and benefits are optimally achieved (e.g. peak shift versus peak reduction). Offers and services to be adapted accordingly based on customer insights,
- Reduce manual processes by eradicating monotonous tasks, robotics and process automation allows operating efficiencies to be gained, and individuals to focus on higher value work,
- Increase customer satisfaction across channels: through predictive network service complaints management and proactive responses.
- Improved reporting and decision support tools that will support sustainable and cost effective network management,
- Better visibility of business challenges and effective actions to respond to those challenges,

² Cost allocated to Evoenergy in accordance with the "ActewAGL Distribution Cost Allocation Methodology, November 2012" which was approved by AER under NER clause 6.5.4 (c) in June 2013. The document will be updated before 1 July 2018 to reflect the requirements of the AER's Ring-fencing Guideline published in October 2017 and explicitly account for gas distribution networks, gas facilities and organisational changes arising from the creation of separate legal entities.

7.8.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> N/A
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> The Business Intelligence program will indirectly support compliance through improving the quality and level of details required of the enterprise data and its input into regulatory and energy market reporting activities.
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> The Business Intelligence Program will support ActewAGL and Evoenergy understand the key metrics and performance indicators that will deliver the value to the business. This supports the ability to make informed decisions relative to the business and more responsive organisation planning to ensure effective allocation of resources and investment to maintain the continued and efficient delivery of standard control services.
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> The preferred option will indirectly support the safety of the distribution through provision of better understanding of risk trends across distribution systems and the effective use of resources to mitigate.

7.8.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) *The forecast capital expenditure reasonably reflects each of the following:*

6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none"> The preferred option focuses on reducing the manual processes associated with the current reporting, reducing reliance on external contracts to develop BI and reporting capabilities, and increasing the quality of the reporting. The project will
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Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

	support the achievement of efficient cost to achieve reporting and business intelligence objectives.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none"> The system capital expenditure will be apportioned across all of ActewAGL's business units, delivering cost efficiencies.
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none"> The preferred option will support the delivery of the most effective solution, while also ensuring that the overall capital expenditure is comparable with other DNSP BI capital investments.

7.9 IT Platforms

ActewAGL is proposing ICT capital investments on a number of IT platforms initiatives to enhance the workforce efficiency and capabilities with its mobile infrastructure, integrated platform for resource planning and work reporting. In addition to the mobile platform, ActewAGL requires a centralised digital content management system that will provide the capability to manage content including self service capabilities to employees, partners, and customers.

In order to ensure ICT security requirements are met, ActewAGL needs to implement an integrated security solution by including solutions for Active Directory, Identity & Access Management and Security Analytics as a platform. Evoenergy's assets classification as Critical Infrastructure (per Federal Government definitions) means that ICT security capability should be maintained in line with the appropriate Australian Signals Directorate (ASD) cyber security maturity level.

The proposed ICT security investments is to ensure the safe and reliable operations to customers through maintaining the technical currency of the ICT security capability. This initiative will focus on delivery of the Security Analytics that uses a cloud solution to process structured and unstructured data to derive insights.

7.9.1 Strategic context

The objective of these foundations is to enable ActewAGL to reduce costs and ensuring value for customers while maintaining the required regulatory obligations. IT platforms are crucial for ActewAGL staff to be productive in the workplace whilst maintaining compliance to regulatory requirements.

The components included in this business case are:

- ICT Security Platform,
- Mobility Platform Upgrade,
- Digital Commerce Platform, and
- Digital Content Management System.

7.9.2 Scope of investment

The scope of this investment includes:

- ICT Security Platform,
- Mobility Platform Upgrade,
- Digital Commerce Platform, and
- Digital Content Management System.

7.9.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT Expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Total Enterprise Capital Expenditure	■	■	■	■	■	■

Amount funded by Evoenergy ³	
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7.9.4 Benefits

Expected benefits for this investment are:

ICT security

- ICT security capability will be maintained in-line with industry peers, and the appropriate ASD ICT security maturity level, to ensure Evoenergy is able to maintain the security of critical network infrastructure,
- Greater efficiency through safer automation of formerly manual processes,
- Reduced liability: insurance providers and legal departments are increasingly wary of cybersecurity risks. Proactive, comprehensive cybersecurity can help mitigate their concerns and reduce associated costs or losses,
- Improved security integration and management reducing the risk of security solution gaps, and
- Increased system reliability and customer satisfaction: security controls not only impede attacks, but they also guard against errors and accidents. This can help minimise damage while speeding up response and recovery, which helps keeps the lights on, pleasing customers and regulators.

Mobility platform upgrade

- Enhanced integration between mobile applications, including corporate applications, along with enhanced offline functionality and improved user experience will improve field crew productivity by eliminating reliance on desktop applications, reducing wait time, and eliminating manual clerical processes.
- Fully mobile enabled field crews to perform end-to-end daily activities in the field (100% remotely) for both work order related and admin related tasks (eg. Timesheets).
- Improved flexibility through the implementation of a single planning tool integrates internally and externally planned work and estimates for reactive work.
- Reduce internal manual interventions and enable mobile work flows, such as field crew overtime and respond in real-time, on-shift schedule changes,
- Mobilise dispatch and scheduling, including matching of staff skillsets and locations, to enable the optimal assignment of work activities,
- Empower end-users and customers by delivering mobile, self-service channels,
- Make informed decisions with integrated real time data on work order progress, assets operations activities, estimated outage duration, and
- Reduced reliance on manual approvals, workflow and paper work instructions, such as, switching instructions, procedures and maps.

Digital commerce

³ Cost allocated to Evoenergy in accordance with the "ActewAGL Distribution Cost Allocation Methodology, November 2012" which was approved by AER under NER clause 6.5.4 (c) in June 2013. See footnote 2.

- Improved expenditure analytics and more accurate expenditure forecasting will improve supplier relationship management and improve Evoenergy's buying power. This will enable savings to be realised during procurement processes,
- Cost savings and enhanced network service offerings for end-use customers by automated business processes eliminating need for manual input during order and inventory management,
- Improved customer-related processes - from accounting to data analysis, and streamlined internal metering and billing processes,
- Enhanced purchasing power resulting from more accurate expenditure forecasts,
- Improved vendor management capabilities driven by better analysis of spending patterns, and
- Ability to respond quickly and cost-efficiently to new market trends, regulations, social networking, and mobile commerce.

Digital content management system

- Increase customer satisfaction: A content management system can help ActewAGL increase relevance of content across all channels and reduce customer access to outdated materials through clearly defined asset and data management workflows.

7.9.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> • Accurate data and ability to access information through mobile channels will help Evoenergy meet the expected demand for standard control services.
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> • Mobile devices used in the field are required to provide support ensuring field staff have access to all OH&S and safety regulations, • The Content Management System (CMS) supports the improvement in safety and compliance as all information is maintained and accessible in one single location and through the same "look and feel", • Changes to the Electricity Supply Act require ActewAGL to maintain a level of ICT Security at a higher standard than previous regulatory periods. As such prudent investments are required to ensure these standards are met, and • The proposed investments will ensure the appropriate level of cyber security mitigation strategy for ActewAGL, as

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

	<p>Critical Infrastructure service provider (per Federal Government definitions) and in line with the appropriate security maturity level under the Australian Signals Directorate (ASD).</p>
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> • The proposed expenditure seeks to uplift and implement the critical IT platforms used to access the key business applications supporting the critical business processes in order to maintain and improve the quality and reliability of supply of standard control services, • The expenditure will increase security through the use of standardised device platform that would facilitate support and maintenance as well as minimise potential risks to ActewAGL's critical infrastructure, • Implementation of digital systems will enable ActewAGL to provide better quality, secure, and reliable information to the business as well as to its customers,
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> • The proposed capital expenditure seeks to maintain critical workplace technology components used in the field to access and support asset maintenance activities and processes. This ensures the continued safe operation of the distribution system and hence the risk of potential failure and/or unplanned production outages is reduced, • The Content Management System (CMS) supports the improvement in safety and compliance as all information is maintained and accessible in one single location that is easily searchable, such as, safety documentation, • Investments to ensure a hardened ICT security perimeter will assist in maintaining the resiliency of ActewAGL's network ensuring control of the network is not compromised,

Mapping to the relevant ‘Capital expenditure objectives’ (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

	<ul style="list-style-type: none"> • ActewAGL is a critical infrastructure provider, it is likely to be a target for cyber-security attacks hence investment is required to improve ICT security capabilities, and • There is an increasing trend in cyber-security related incidents across all industries and ActewAGL requires prudent investments to ensure it is able to maintain its capability to provide a safe, reliable and secure network.
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7.9.6 Mapping to NER capital expenditure criteria

Mapping to ‘Capital expenditure criteria’ (Chapter 6, National Electricity Rules) *The forecast capital expenditure reasonably reflects each of the following:*

6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;	<ul style="list-style-type: none"> • This initiative will improve more reliable network operations enabling ActewAGL to fulfil its capital expenditure more effectively. Moving to digital and mobile platforms will streamline manual functions resulting in reduced expenditure, and • All ActewAGL ICT programs undergo a strict governance process which will consider a number of factors including options analysis, return-on-investment and consideration of capital vs. operating expenditures.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none"> • By not uplifting IT platforms supporting critical business processes, this exposes ActewAGL to unacceptable levels of risk to its business operations, potentially resulting in the failure to meet the capital expenditure objectives 6.5.7(a)(2) and (3).
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none"> • N/A

7.10 Hardware and software refresh

ActewAGL's ICT software and hardware requires regular updates in order to ensure their fit for purpose, to maintain technical currency within vendor support parameters in order to maintain the reliable technology required to support the delivery of network services. This investment also allows ActewAGL to meet business demand and stay within acceptable performance and reliability requirements.

7.10.1 Strategic context

ActewAGL operates a complex ICT capability which is enabled through software and hardware. Ensuring that these assets are kept efficient, contemporary and functional is a requirement for the business. ActewAGL's ICT environment is ageing, with assets reaching end-of-life and increasing operational risk profiles. The remediation of these risks, requires investment in a refresh of software and hardware to avoid business disruption and maintain a safe, quality, reliable and secure supply of network services. As ICT software and hardware ages, it will become increasingly challenging to sustain service standards. In ActewAGL's ICT environment, the Operating system is an essential component that must be kept current to ensure ability to utilise new technologies.

7.10.2 Scope of investment

The planned refresh includes ICT Software assets such as:

ICT software asset category	Asset name
Business Productivity Software	Microsoft Office Adobe Acrobat Skype for Business (including Video Conferencing)
Infrastructure Software	Microsoft System Center (Datacentre management) CommVault (Data backup and recovery) Exchange TrendMicro (Antivirus and security) Citrix XenApp (Application virtualisation) VMWare (Platform virtualisation) Nagios (Network and infrastructure monitoring) SolarWinds (Network performance management)
Software Development Lifecycle Software	Visual Studio (MS application development platform) Team Foundation Server (MS application development collaboration) Enterprise Architect (Systems and infrastructure architecture suite) HP Quality Center (Software for application lifecycle management)
Database Management System Software	SQL Server (Database management system) Oracle (Database management system)
Content and Collaboration Software	SharePoint (Content management and collaboration) Project Server (Project management system) Sitecore (Web content management) ServiceNow (Service management system)
HR and Finance Software	Aurion (Human resources management) Bloomberg Professional (Financial services) FBT Simplifier (FBT accounting) Accounts Production (Corporate financial reporting) Integrity (Human resource management) Oracle E-Business Suite (Financial management) TM1 (Financial management)

Legal and Compliance Software	RecordPoint (Record management) CMO Compliance (Legal compliance) Satisfy2000 (Customer Complaints) VisualFiles (Case management)
EHSQ Software	Cintellate (Environmental, health and safety management)
Operations Software	MR6 (Call management) AIRS for DBYD (Asset information request for dial before you dig) Calltaker (Call management) TCS (Call management)
Stores and Logistics Software	Oniqua Analytics Solutions (Inventory management) Protrack (Inventory tracking)
CAD	eMaps (Asset mapping) Trimble Pathfinder Office (GPS system) AutoCAD Map, Raster Design, Design Review, True View (Asset design and mapping) Meridian (Geographical system) Imagination (Asset image management) Inventor (Asset and mechanical design) PDF995 (Document system)
Operating Systems	Microsoft Windows (Operating system) Unix (Operating system) Linux (Operating system) VMWare (Virtual environment management) ESX (Virtual management) Apple iOS (Operating system)

The planned Hardware Refresh includes ICT infrastructure assets such as:

- UPS/rectifiers batteries,
- Switches,
- Routers,
- Radios systems,
- VoIP,
- Security appliances, and
- End user devices, including desktops, laptops and mobile devices.

7.10.3 Cost of investment

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

ICT Expenditure	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Total Enterprise Capital Expenditure	██████	██████	██████	██████	██████	██████
Amount funded by Evoenergy⁴	██████	██████	██████	██████	██████	██████

⁴ Cost allocated to Evoenergy in accordance with the "ActewAGL Distribution Cost Allocation Methodology, November 2012" which was approved by AER under NER clause 6.5.4 (c) in June 2013. See footnote 2.

7.10.4 Benefits

Expected benefits for this investment are:

- Risk of software/hardware failure reduced or eliminated,
- Remain in support - Reduction in opportunity Operating expenditure increases associated with additional business and IT requirements to business processes on out-dated software and hardware,
- Ensure security is maintained – Security patches can continue to be applied and vendor can continue to make improvements to how robust the system is, to ensure that weaknesses within the application are not taken advantage of,
- Employee satisfaction by using up-to-date, modern software and hardware,
- Maintain effective ability to work with external industry and market organisations by reducing likelihood of application obsolescence,
- Productivity improvements from enhanced integration, application features and functions,
- Improved ability to forecast application changes/improvements,
- Software/hardware age profiles comparable to industry,
- Improving customer service standards through investment in maintaining currency of MR6 and Calltaker systems,
- Maintain ability to support forecast ICT projects through provision of suitable hardware,
- Better financial management and improved compliance with regulatory authorities ATO, AER, ASIC, ICRC and AEMO for information requests,
- Improved interfacing between OT and back office systems,
- Maintain the ability to conduct required ICT security activities,
- Allow ActewAGL to meet the necessary legislative and regulatory requirements by ensuring relevant software includes the latest rules, regulations, etc.,
- Reduce the risk of incompatible or unsupported interfaces between different, but related, software packages and their versions, and
- Support the ability of ActewAGL to react to new or more efficient technology and business opportunities by maintaining current and effective ICT infrastructure; this may not be possible with ageing infrastructure.

7.10.5 Mapping to NER capital expenditure objectives

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) <i>The forecast capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	• N/A
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	• N/A

Mapping to the relevant 'Capital expenditure objectives' (Chapter 6, National Electricity Rules) *The forecast capital expenditure is considered necessary to achieve:*

<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> • ActewAGL's ICT software/hardware refresh program will upgrade a number of ICT components to ensure that they will continue to be vendor supported and their technical currency is maintained, hence reducing the risk of potential failure and/or unplanned production outages. This is in-line with the capital expenditure objective through: • Quality, reliability and security of IT systems and services, • Stability of ICT systems, • Continuation of ICT vendor support, and • Compliance of ICT systems.
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> • Evoenergy's proposed expenditure to periodic refresh and maintain currency of its security standards and systems are in line with industry practices, in ensuring the continual safe operations of the distribution systems through the supply of standard control services to the end users, employees, stakeholders, and the public.

7.10.6 Mapping to NER capital expenditure criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) *The forecast capital expenditure reasonably reflects each of the following:*

<p>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</p>	<ul style="list-style-type: none"> • Regular upgrades of ICT software is a prudent industry practice to minimise the risks associated with failures associated with operating out-of-date applications, • This project enables ActewAGL to: <ul style="list-style-type: none"> • Maintain the existing availability of ICT services, • Maintain integrity of ICT services, • Reduce the likely additional operating expenditures and
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Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)
The forecast capital expenditure reasonably reflects each of the following:

	<ul style="list-style-type: none"> processes due to using out of date applications, and • Comply with regulatory obligations or requirements. • Refreshing the core ICT infrastructure is the efficient cost option to maintain suitable infrastructure operations in sustaining ActewAGL's distribution network objectives.
6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and	<ul style="list-style-type: none"> • The cost and options to each ICT software and hardware refresh will be reviewed by ActewAGL management through business cases and expenditure governance processes. This approach will ensure prudent management considerations will be given for appropriate options and efficient costs, • The Capex is necessary in order to maintain the integrity of network supply services by ensuring: <ul style="list-style-type: none"> • Stability and continuation of ICT vendor support, • Security and integrity of business information, • Quality and reliability of ICT systems, and • Compliance of ICT systems.
6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.	<ul style="list-style-type: none"> • Cost of each refresh will be confirmed closer to the date of implementation/refresh and ActewAGL management will review justification and competitive cost management at business cases and procurement processes to ensure competitive market pricing.

8.0 Current period reconciliation

- *Evoenergy delivered a greater scope of technology assets against the AER's allowance for non-network capital expenditure for the 2014-19 regulatory period, resulting in an increase of \$32.2 million against the approved spend of \$24.6 million.*
- *The increase has been primarily due to the need to respond to significant regulatory and industry changes, as well as undertake replacement of end-of-life critical systems.*
- *Evoenergy has invested significantly in the replacement of its aged asset management technologies critical to the delivery of network services through safe and reliable distribution network operations. Evoenergy has invested in bringing its operational technologies to the industry levels for electricity distribution businesses.*
- *The increase in technology investments have been balanced by significant reductions in Evoenergy's network replacement and augmentation capital expenditures and has also enabled Evoenergy to achieve operating expenditure reductions.*

The purpose of this section is to explain the key drivers behind movements in Evoenergy's actual non-network ICT expenditure during the 2014-19 regulatory period in the context of the AER's allowance.

8.1 2014-19 regulatory period non-network ICT capital expenditures

In the ICT submission for the 2014-19 regulatory period, Evoenergy proposed ICT programs in the replacement of its Enterprise and Asset Information Systems, which was accepted by the AER in the 2015 final decision. The table below compares the actual expenditure against the approved allowance:

(Note: All amounts are in \$Thousands in FY 2019 real dollars)

Non-network ICT Capex	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	Total
AER final decision	13,233	3,031	2,162	2,787	3,420	24,634
Actual	18,077	13,297	7,994	12,615	4,869	56,852
Variance	4,844	10,266	5,832	9,828	1,449	32,219

The table shows that Evoenergy incurred non-network ICT expenditure of \$56.9 million, against the \$24.6 million allowed in the AER's 2015 final decision. This represents an increase of \$32.2 million, which reflects Evoenergy's strategic direction to incur additional technology investments as a response to regulatory and industry changes (see section 3).

In particular, increased penetration of PV in the ACT region required more sophisticated network control systems, such as extending network connectivity to the low voltage level. Enhancements were made to the asset management system to support the requirement to have an asset management system compliant to ISO 55000 (see attachment 1 of Evoenergy's submission). Section 8.1.2 below sets out the key drivers for the additional expenditure.

8.1.1 ICT programs delivered during the 2014-19 Regulatory Control Period

During the 2014-19 Regulatory Control Period, the following Enterprise Systems programs were completed to maintain Evoenergy's core IT platforms and services in driving technology currency and efficiency:




- Consolidation and rationalisation of corporate and asset applications, to improve efficiency,
- Risk mitigation in the replacement of applications that supports the core accounting, HR, payroll and financial functions,
- Data storage initiatives to mitigate the risk in relation to data centre environments, DR and business continuity functions whilst also establishing a strategic platform for the future,
- Risk mitigation in periodic refreshes for Corporate Operating Systems, Applications, infrastructures that are dated and reached end of support,
- Commence the provision of mobility infrastructure to support network business mobility and field workforce initiatives, and
- Delivered an enterprise wide ICT Security Program, which reduced risks to organisational information assets, reputation and customer data, establishing an appropriate ICT security foundation for the next regulatory control period,

Evoenergy's regulatory submission for the 2014-2019 regulatory period outlined 24 projects in the asset management and operational systems program. A total of 17 of these projects are expected to be completed, with the remaining projects re-prioritised or cancelled due to changes in Business priorities and capabilities. In addition, a further 23 key projects are expected to be delivered, that were not included in the submission. Refer to Appendix A for a list of key projects.

8.1.2 Variations of 2014-19 regulatory Period ICT programs

The table below summarises the variance of each ICT program from submission, the following sections contain the program details of the large variance:

<i>Non-network programs \$ million (2018/19)</i>	<i>2014-19 Allowance</i>	<i>Variance</i>	<i>2014-19 Actual</i>
Corporate Financial Reporting and Budgeting			
Business Intelligence			
ICT Infrastructure			
Data Storage			
Operating Systems			
Treasury			
Mobility Infrastructure			
Applications			
GIS/ArcFM			
ADMS			
Cityworks and Mobility			
Velocity			
Power of Choice			
Minor IT			
Riva			
Outsystems			

<i>Non-network programs \$ million (2018/19)</i>	<i>ICT expenditure</i>	<i>2014-19 Allowance</i>	<i>Variance</i>	<i>2014-19 Actual</i>
Productivity Review				
Total		24.6	32.2	56.9







8.2 Justifications for variance

A greater scope of technology investments has been delivered against the 2015 AER final decision for the Corporate and Asset Information Systems programs in the 2014-19 regulatory control period.

The three main drivers of Evoenergy's ICT Capital Expenditures variances were:

1. **Non-discretionary ICT expenditure** – Compliance costs relating to industry and regulatory changes which were unforeseen at the time of the 2015 AER price review, hence Evoenergy could not determine the ICT requirements or the related expenditures at the time of submission.
2. **Industry transformation** – Expenditure to provide the necessary technology tools, systems and platforms required to sustain network services and operations in an era of rapid industry change and, achieve reductions in Evoenergy's operating expenditure.
3. **ICT expenditure associated with maintaining the safety of the distribution system** – Expenditure associated with the safety of field crews and customers, along with safety operations of the distribution systems including the expenditure required to maintain the currency of critical infrastructure ICT systems.

The programs, their key drivers of expenditure variance and their alignment to the NER expenditure objectives are summarised in the table below:

Driver	Program	Variance \$million	Alignment to NER expenditure objective
Non-discretionary ICT Expenditure	Power of Choice		6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;
Industry Transformation	Corporate Financial Reporting and Budgeting		6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent:
	Business Intelligence		
	ICT Infrastructure		
	Data Storage		
	Operating Systems		

Driver	Program	Variance \$million	Alignment to NER expenditure objective
	Treasury		(iii) maintain the quality, reliability and security of supply of standard control services; and
	Mobility Infrastructure		
	Applications		(iv) Maintain the reliability and security of the distribution system through the supply of standard control services.
	Cityworks and Mobility		
	Velocity		
	OutSystems		
	Productivity Review		
	Total	\$25.3	
ICT Expenditure associated with maintain the safety of the distribution system	ADMS		6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services
	GIS / ArcFM		
	Riva		
	Minor IT		
	Total	\$0.5	

8.2.1 Non-discretionary expenditure

Over the 2014-19 regulatory control period, Evoenergy was required to deliver ICT systems changes to support network business compliance, due to regulatory and industry changes, including:

- the suite of AEMC Power of Choice Reforms;
- the AER electricity distribution ring-fencing regulatory changes; and
- changes in the operation of the National Electricity Market

Evoenergy did not include the Power of Choice expenditures within its 2014-19 regulatory proposal as the AEMC determinations were not finalised at the time and the related ICT systems expenditures could not be forecast. Evoenergy has complied in delivering the Power of Choice programs to the ACT consumers through changes to its systems and business processes. These changes have been consistent with those delivered by other distribution network businesses.

Evoenergy also delivered its obligations to the electricity distribution ring-fencing requirements, which were formalised after its 2014-19 regulatory submissions.

Additionally, a number of Evoenergy systems changes were completed in line with the operational changes to the National Electricity Market systems, i.e. MSATS systems changes.

The following table lists the regulatory and industry changes with resulting impacts in Evoenergy's ICT systems, the changes and timing of compliance have been within the 2014-19 regulatory control period.

Changes		Timing for compliance
AEMC - Power of Choice Reform		
Power of Choice – Distribution network pricing arrangements		November 2014 to December 2017
Power of Choice – Expanding competition in metering and related services		November 2015 to December 2017
Power of Choice – Customer access to information about their electricity consumption		November 2014 to December 2017
Power of Choice – Improved demand side participation information provided to AEMO by registered participants		March 2015 to December 2017
Power of Choice – Multiple trading relationships		February 2016 to December 2017
Power of Choice – Embedded networks		December 2015 to December 2017
Ring-Fencing		
Electricity Distribution Ring-Fencing		December 2016 to January 2018
NEM and Industry Changes		
Compliance to MSATS systems changes e.g. CATS		October 2016


Evoenergy incurred system expenditures in compliance to the above regulatory changes (refer to Appendix B for detail descriptions and justifications).





8.2.2 Industry transformation

Following a period of low investment in the 2009-14 regulatory control period, Evoenergy implemented a number of key enterprise and asset management systems to bring its technology capability in line with changes in the electricity distribution industry.

The enterprise systems include upgrades of core infrastructures and asset management systems as a key investment strategy to maintain the quality, reliability and security in Evoenergy network services, especially following the AER's determination that resulted in a significant reduction in operating expenditure, including ICT operating expenditure.

The investments and associated outcomes are summarised within the table below, with detail descriptions provided in Appendix B:

Program	Non-network ICT expenditure variance (\$million)	Description of outcomes
Enterprise systems		<ul style="list-style-type: none"> Actual expenditure below the submitted forecast, Delivered upgrades to Evoenergy's enterprise technology infrastructures, data storage and core applications, Delivered upgrades to Evoenergy's corporate finance, treasury and reporting functions, and Management review of technology strategy resulting in the deferral of expenditures in



Program	Non-network ICT expenditure variance (\$million)	Description of outcomes
		business intelligence and mobility infrastructure.
Cityworks/Mobility Project		<ul style="list-style-type: none"> • Network Capex efficiency achieved through improved asset management expenditure control, and • Improved effectiveness in work force through mobility. Maintained Evoenergy's reliability in the delivery of standard control services following a significant regulatory reduction in opex.
Velocity		<ul style="list-style-type: none"> • Uptake rate of photovoltaic services were greater than the demand forecast at the time of submission, and • Improved process efficiency associate with CATS and MSATS process.
Outsystems		<ul style="list-style-type: none"> • Implementation of internal tools which enabled greater use of information available within Evoenergy core systems, • Improved efficiency in the Retailer NMI process in both accuracy and response time, maintained Evoenergy's delivery of standard control services following a significant regulatory reduction in opex, and • Platform upgrade to ensure OutSystems is vendor supported and transfered OutSystems to an Evoenergy managed cloud instead of a consulting firm cloud for cost effectiveness and self-sufficiency.
Productivity Review		<ul style="list-style-type: none"> • Enabled the scheduling process to improve field crew utilisation and productivity, • Enable a concerted approach to the implementation of Evoenergy's mobility roadmap, and • Timesheet efficiencies - Allow budget owners to approve time to be booked to their project, reduce double entry

8.2.3 ICT expenditure associated with maintaining the safety of the distribution system

Over the 2014-19 regulatory period, Evoenergy implemented operational technology systems to replace its aged network control systems and infrastructures. The replacement solution is an industry comparable ADMS and integrated network asset system, as Evoenergy's core operational technology tool required to continually meet its compliance obligation in the safe operations of the electricity distribution systems, ensuring safety of its field crews, customers, service providers and the public.

The ADMS is a significantly complex and integrated operational technology, the scope and expenditures in relation to ADMS development, upgrade and currency maintenance have been high over the 2014-19 regulatory control period. These expenditures were under-estimated within the 2014-19 regulatory proposal. Evoenergy has gained sufficient experience in managing the expenditures relating to systems upgrades and requirements for maintaining system currency, which will be reflected in a more reliable 2019-24 expenditure forecast plan.

The investments and associated outcomes are summarised within the table below, with detail descriptions provided in Appendix B:

Program	Variance (\$million)	Description of outcomes
ADMS		<ul style="list-style-type: none"> • Increase in automation of the creation of customer notifications reducing the risk of notifications for planned outages not being sent, • Ability for electrical operators to see the live network map, further improves the safety of our staff, reducing the likelihood of accidents, • Increased and specific monitoring of power transformers, reduces the likelihood of a catastrophic failure, • Ability to test changes to ADMS prior to releasing any change into Production, reduces the likelihood of existing functionality breaking, and therefore impacts to core ADMS process including customer notifications, outage response, • Ability to remain connected to the rest of the environment, by having up to date hardware, enabling security patching, and • Reduce the likelihood of a cyber attack on the ACT electricity distribution network by ensuring security is maintained.
GIS / ArcFM		<ul style="list-style-type: none"> • Increase in automation of updates to meter premises, reducing the likelihood of customers being missed in planned access or outage notifications, and • Increase in automation of feeder updates, reducing the likelihood of feeders being missed and reducing the likelihood of customers being missed in planned access or outage notifications

Appendix A – List of key asset information system projects for the 2014-19 regulatory period

Evoenergy's regulatory submission for the 2014-2019 RCP outlined 24 projects. A total of 17 of these projects are expected to be completed, with the remaining projects re-prioritised or cancelled due to changes in Business priorities and capabilities. In addition, a further 23 key projects are expected to be delivered, that were not included in the submission. The key list of projects is included in the following table.

IB number	Included in 2014-19 submission?	Project Name	High Level Benefits	Benefits Category
GIS/ArcFM				
N/A	Y	Implementation of ArcFM Designer	To streamline design, estimation, construction, and workflows all within the GIS; increasing the efficiency of design and construction processes, leading to faster response times to customers	Customer Service
2	Y	Integration of Designer and Cityworks	Removes the need for data double entry and management of a single project in two separate systems, further streamlines the process, leading to faster work packaging and customer service	Customer Service
1	Y	Integration of UA into Designer	Alleviate risk to asset data and information by aligning attributes to standard construction sets	Quality
N/A	Y	Storage of Designer Construction Drawings in Meridian Drawing Management System	Provides a means to track the evolution of designs post-construction and redlining	Quality
11	Y	ArcFM Fibre Manager implementation	Record, map, plan, design and manage optical fibre assets in a single repository in the GIS	Quality

IB number	Included in 2014-19 submission?	Project Name	High Level Benefits	Benefits Category
23	N	GIS Upgrade	Ensure the system is vendor supported	Quality
52	N	Integration with Velocity	Enables the automation of the sync of meter-premises, enabling ArcFM and therefore ADMS to be up to date, improving accuracy of planned outage notifications	Customer Service
79	N	Feeder Identification Tool	Enables the automation of identification of edited feeders, so that these can be updated in the ADMS, minimising the risk of edited feeders not being identified, and customer outage notifications being incorrect	Customer Service
ADMS				
N/A	Y	Implementation of LV network	Provides the Control Room visibility of the entire AAD electrical network to the 'edge of the grid', supporting faster fault response, improving delivery of service to customers and to ensure the safety of AAD staff and the public	Customer Service
N/A	Y	Integration with Velocity	Enable mapping of customer outage calls to network supply points as well as provide lists of customers affected by planned outages to Velocity for planned outage notification	Customer Service
N/A	Y	Integration with Cityworks	Provides end-to-end synchronised workflows/processes for outage management	Customer Service
49	N	Implementation of ADMS Mobility	Enables Electrical Operators access to switching information and	Safety

IB number	Included in 2014-19 submission?	Project Name	High Level Benefits	Benefits Category
			real time data on the state of the network	
39	N	Development of the Power Transformer Risk Based Maintenance Pilot	Enable the improvement of modelling asset deterioration to better inform asset management decisions	Efficiency
10	N	Implementation of the ADMS Test Environment	Enables testing of all hot fixes prior to deployment to ensure defect fixes do not introduce new issues	Quality
Various	N	Hot Fixes	Implementation of defect fixes and minor enhancements	All
Cityworks and Mobility				
2	Y	Integration with Designer Workflow Management	Provide a workflow management from project creation, design development and project cost estimation	Customer Service
N/A	Y	Integration with ADMS	Provide an end-to-end streamlined workflow/process for all works requiring network switching	Customer Service
53	Y	Implementation of Cityworks Mobility	Enables remote access to network geographical information, asset data and works management information	Efficiency
N/A	Y	Purchase of mobile devices	Provision and enrolment of devices in airwatch for security	Efficiency
12	N	Oracle Actuals in Cityworks	Improve the ability to monitor actual financial performance	Efficiency
51	N	Cityworks 2015.1 Upgrade	Ensure Cityworks is upgraded to a version that does not rely on the Silverlight plugin as this is shortly not supported by all browsers	Quality
42	N	Power of Choice	Changes required to remain compliant	Regulatory

IB number	Included in 2014-19 submission?	Project Name	High Level Benefits	Benefits Category
Outsystems				
40	Y	Portal – Customer Information	Provides end customers with historic and current usage, outage maps, ability to report asset damage and provide feedback	Customer Service and Regulatory
	Y	Portal – Works	RFS and RSM forms will be available electronically	Customer Service
103	Y	Portal – Demand Management	Customers will be able to opt in or opt out of demand management initiatives	Customer Service
N/A	N	Implementation of a Retailer NMI Tool	Enable Retailers to have visibility of NMI data for the NMI's they are the FRMP instead of contacting Evoenergy to clarify any issues they may have	Customer Service
N/A	N	Implementation of internal Tools	Enable greater use of information available within Evoenergy core systems	Efficiency
62	N	Platform Upgrade	Ensure Outsystems is vendor supported	Quality
26	N	Cloud Migration	Transfer Outsystems to an Evoenergy managed cloud instead of a consulting firm cloud to become self-sufficient	Quality
Minor IT				
Various	Y	Velocity Releases	Releases to maintain compliance	Regulatory
Various	Y	Riva enhancements	Releases to improve asset management	Efficiency
77	N	Scheduling Enhancement	Improve the scheduling process to improve field utilisation	Efficiency
76	N	Mobility Roadmap	Enable a concerted approach to the implementation of mobility at Evoenergy	Efficiency and Quality

IB number	Included in 2014-19 submission?	Project Name	High Level Benefits	Benefits Category
91	N	Timesheet efficiencies	Allow budget owners to approve time to be booked to their project, reduce double entry	Efficiency
8	N	Replacement of Oniqua	Improve analysis of inventory to reduce stock holdings while utilising a vendor supported solution	Efficiency
75	N	Implementation of Integrated Vehicle Management System	Easily enable drivers to navigate directly to an asset, improve lone worker safety	Efficiency
Velocity				
N/A	N	Billing compliance and stabilisation	To ensure that Evoenergy resolved compliance issues following AEMO Audit	Regulatory
5	N	Photovoltaic in Velocity	Enable the capture of photovoltaic asset data in Velocity for later use in ADMS and ArcFM, improve accuracy of the PV inspection letter process	Customer Service
25	N	CATS Change from CR2501 to CR2001	Reduce compliance issues with the CATS CR200x series	Regulatory and Customer Service
41	N	Power of Choice	Changes to remain compliant	Regulatory
Riva				
36	N	Riva Upgrade	Ensure Riva is vendor supported and ensure that Evoenergy could be ISO 55000 compliant	Quality

Appendix B - Supporting information of the additional ICT expenditures

The following sections provide the supporting information, on the additional areas of Asset Information Systems, delivered over the 2014-19 regulatory control period, including their descriptions, justifications, status and benefits.

B.1 GIS/ArcFM

The scope of GIS / ArcFM consists of the following two projects:

- GIS Upgrade
- ArcFM / GIS Integration with Velocity
- Feeder Identification Tool

GIS Upgrade

Description

Evoenergy is currently utilising ArcFM version 10.1.1. The vendor, Schneider, advised that this product was out of support in April 2016. Initiative Brief (IB) 23 was raised to conduct an upgrade which was approved to proceed by the Operational Technology Governance Forum (OTGF) in April 2016.

The project was instigated to upgrade Schneider ArcFM and ESRI ArcGIS to 10.2.1.c. The end of life for the upgraded version is May 2022. The project also included an investigation into the use of cloud infrastructure for the application and a performance investigation.

Justification

The key justification for the upgrade was to ensure the core application was supported by the vendor to avoid additional overheads of maintaining an obsolete system and ensure future upgrades require minimal work. This ensures that Evoenergy can use COTS GIS software under warranty and vendor support, in alignment with the AIS principles.

Schneider had also identified an issue with the base product which greatly affects performance of opening large designs such as those greenfields projects. This issue means that it is taking up to four hours to open such a design. This issue is addressed in version 10.2.1c.

The investigation into performance was included in the project to investigate performance issues reported by users, making designing and other activities inefficient and frustrating.

The investigation into cloud infrastructure was instigated to ensure that infrastructure is being provisioned at the lowest overall cost for Evoenergy.

Status

The performance investigation has concluded with configuration and defect fixes being made.

The investigation into the use of cloud infrastructure, resulted in the decision to implement the upgrade in the cloud.

The upgrade will complete in 2018.

Benefits

The performance fixes have resulted in increased stability and responsiveness by 20 per cent on both physical and virtual servers. There have been small differences in seconds for mini queries,

however for larger actions such as placing a padmount, with many queries involved, there has been a significant improvement. At the start of the project, placing a padmount took six minutes and 30 seconds, at the end of the performance phase of the project, this activity took 55 seconds.

Additional benefits are expected from the cloud implementation including a decrease in annual costs and greater flexibility in setting up additional environments. In addition, the upgrade mitigates running and maintaining an application out of support, ensuring that annual maintenance costs are minimised.

ArcFM / GIS integration with Velocity

Description

The near real-time ADMS-ArcFM synchronisation provides the ADMS with customer connectivity, enabling proper operation of the OMS function. ArcFM requires immediate update of meter information in order to match customers to their service point. Prior to this project, this occurred by a manual process where an editor was required to manually update, on average, 40 meters per day. This project is catalogued as IB 052.

Justification

The ramification of ArcFM not holding up to date information on meter premises is that customer notifications for planned outages are at risk of excluding some customers. This project automates the synchronisation of meter premise information from Velocity to ArcFM, allowing manual intervention only for exceptions. This increases the value of the manual work and minimises the risk of incomplete customer notifications, allowing Evoenergy to meet regulatory and customer expectations.

Status

The interface went live in May 2017.

Benefits

The interface mitigates the risk of not having up to date meter premises in ArcFM/ADMS, resulting in incomplete customer notifications for planned outages. The interface achieves this by automating the process, ensuring it occurs sooner. In addition, the process identifies all the existing exceptions that did not process correctly that can be investigated manually. The number of exceptions has dropped significantly from a total of 2270 exceptions as of 5 May 2017 to 233 exceptions on 14 November 2017. This tool has provided greater visibility of the status of this syncing, enabling the Evoenergy Data Governance Committee to provide greater monitoring and governance of the process.

Feeder Identification Tool

Description

GIS editors of high volume work such as service markings had to manually track the affected feeders and enter these into spreadsheet to be provided to the Operational Information Controllers who then export the feeders into the ADMS. The OTGF reviewed this project as IB 79.

Justification

The manual process was intensive and prone to error. Making an error or missing a feeder results in potential errors in customer notifications for planned outages.

Status

This project has been completed, with the tool deployed and the paper process removed.

Benefits

The tool further mitigates the risk of the ADMS not holding accurate data for customer notifications. In the event of a customer not being notified, this tends to result in a Type 3 breach, leading to consumer safety risks, reputational damage and rebates, and sometimes fines.

B.2 ADMS / Telvent

The scope of ADMS / Telvent consists of the following four projects:

- Implementation of ADMS Mobility
- Power Transformer Risk Based Maintenance
- ADMS Hot Fixes
- ADMS Upgrade

Implementation of ADMS Mobility

Description

The ability to provide the Advanced Distribution Management System (ADMS) on an iPad is listed as IB 49. The Initiative was to provide WebDMD and Field Client on relevant individuals' iPads. Access to the ADMS Web Services enables Real Time visibility of the current operational State of the Network (via Geographic and Composite maps) and enables Electrical Operators to receive Planned and Unplanned Switching Instructions and Permits.

Justification

Enabling electrical operators to have real time visibility directly contributes to Network Safety by ensuring that the control room and field views of planned and unplanned switching instructions are aligned.

Status

ADMS WebDMD and Field Client were rolled out and made available to relevant individuals during 2017.

Benefits

The key benefit is a risk mitigation with regards to safety of our field workers.

Power Transformer Risk Based Maintenance

Description

The Power Transformer Risk Based Maintenance project was registered as IB 39. This is a data analytics project using machine learning techniques to better understand the health of each power transformer in the Evoenergy fleet as a function of each transformer's individual data.

Justification

This project has the ability to verify or improve the asset management plan for power transformers. This has the ability to optimise maintenance expenditure and enable improved tracking of the transformers to enable de-energisation prior to a catastrophic failure in the event of a significant issue.

Status

The project expects to complete for Power Transformers in early 2018.

Benefits

The in depth analysis enables the creation of personalised and optimised treatment plans for each power transformer, enabling the extension of asset life, optimising maintenance expenditure and maximising investment effectiveness in maintenance expenditure and planning.

Hot Fixes

Description

A new IB is created for each hot fix. Hot fixes include defect fixes and minor customisations requested by the business.

Justification

Hot fixes are imperative in resolving any issues within the application and making key improvements. For example, one minor customisation implemented in 2017 automated the process of creating files for customer notifications. This is an integral improvement in the planned customer notification process as there had been instances where the file was not created due to user error, and the notification for the outage was therefore not created.

Status

Several hot fixes per year have been occurring in ADMS. The final 2017 hot fix will Go-Live in December 2017.

Benefits

The benefits of hot fixes include improvements in the customer notification process and operational efficiencies.

ADMS Upgrade

Description

The current version of ADMS used by Evoenergy is running on a Windows Server 2008, Windows 7 and SQL 2008 platform and on a 2013 edition of HP Blade servers and workstations. This ageing hardware will shortly be unsupported, preventing security patching from occurring. In addition, Evoenergy does not currently have the EMS module, which prevents Evoenergy from modelling the transmission network and also prevents running load flow and short circuits on this part of the network. The IB was lodged as number 73.

Justification

The ADMS Upgrade aligns with Evoenergy's strategy to improve

- customer service through improved online functionality,
- organisational capability through enhanced field applications, and
- the transition towards Evoenergy becoming a DSO and DSM.

In addition, the new functionality in the ADMS version ensures that Evoenergy can meet anticipated regulatory and industry changes associated with demand response, embedded generation and micro grids, passing decision making control to customers and penalties for poor power quality. The new ADMS version will support disruptive technology changes including offline monitoring and online monitoring or control of EVs, Battery Chargers and all forms of micro-generation, enabling Evoenergy to permit a larger penetration of these into the Network.

Status

The ADMS Upgrade Design phase concludes in December 2017, after which approval aligned with Evoenergy Governance will be sought to continue the project through to implementation.

Benefits

The ADMS upgrade will deliver capabilities for the changing industry and regulatory environment. In addition, it will ensure the hardware is supported and security patching can continue.

B.3 Cityworks / Mobility Projects

The scope of Cityworks / Mobility Projects consists of the following two projects:

- Oracle Actuals in Cityworks
- Cityworks 2015.1 Upgrade

Oracle Actuals in Cityworks

Description

Cityworks did not hold actual cost information, making it difficult to manage costs in real time for Program of Work initiatives. The project included an additional integration between Oracle financial systems and Cityworks, and a data migration of cost information. This IB was lodged as 12.

Justification

The ability to manage costs for every program of work initiative is important in driving efficiencies. In addition, the project provides additional efficiencies during variance analysis, instead of moving between various reports and applications.

Status

The initiative has been completed.

Benefits

The project has delivered efficiencies in actuals versus budget analysis, and enables proactive monitoring of costs on individual Program of Work initiatives.

Cityworks 2015.1 Upgrade

Description

The Cityworks Upgrade, IB 51, is to upgrade Cityworks from 2014 SP6 to 15.1. The key reason for the upgrade is compatibility with technologies. In response to flourishing native web support for services previously provided by plugins, and to reduce sources of performance problems, crashes, and security incidents, browser suppliers are reducing their support of plugins. The use of the Silverlight plugin (utilised by Evoenergy's current version of Cityworks) is being removed by browsers and software suppliers. Chrome and Firefox have already withdrawn support of the Silverlight plugin and ESRI withdrew support from June 2016 with their release of ArcGIS 10.4. This culminates in the requirement for a Cityworks upgrade to ensure it can continue to be used. Cityworks 15.1 supports javascript and accordingly removes the need for Silverlight.

Justification

Without the Cityworks Upgrade, browsers cannot be updated at Evoenergy which will cause issues with other applications, and similarly ArcGIS would not be able to be further upgraded. This leads to a multitude of issues relating to performance, platform stability, vendor costs and security.

Status

The Cityworks Upgrade is currently in the design phase, and is scheduled to Go-Live in early 2018.

Benefits

The benefits include continued use of the application without replacement during this RCP and compatibility with upgraded browsers and applications ensuring that Cityworks doesn't stop critical upgrades for other applications.

B.4 Velocity

The scope of Velocity consists of the following two projects:

- Photovoltaic in Velocity
- CATS Change from CR2501 to CR2001

Photovoltaic in Velocity

Description

IB 5 is to implement PV in Velocity through the creation of new asset tables, new notification letters for PV Generator Testing and data migration from legacy systems and processes.

Justification

The number of customer owned and operated distributed PV generators connected to Evoenergy's network is growing in the ACT. In 2016 there are approximately 16,000 PV generators connected, impacting Evoenergy in several ways. This includes PV Generator Testing notification, Reporting, Network Planning and Network Operations. These processes are currently managed by legacy applications and spreadsheets, leading to inefficiencies and inaccuracies.

Status

The design phase is underway and is scheduled to be in Production in 2018.

Benefits

The removal of PV letter notifications from the legacy system enables the legacy system to be retired. The accuracy of customer notifications for PV testing will improve and the PV data can be utilised by other applications for planning and operational purposes. This is especially important given the expected increase in PV penetration.

CATS Change from CR2501 to CR2001

Description

The CATS 2501 Change Request (CR) is a transaction used to simultaneously register a new installation/NMI, meter and data streams. Utilising the 2501 process means the system waits until all pre-requisites are completed before creating the NMI at MSATS. Pre-requisites include meter is installed, retailer has been associated, site is energised and contract is created.

This project, IB 25, proposed for the 2501 to be split.

Justification

The split lays the foundation for the Power of Choice regulatory changes by decoupling the various transactions.

Status

This project was completed in 2016.

Benefits

The split has provided more flexibility for Evoenergy to meet Power of Choice regulatory changes, and reduce compliance issues and manual processing related to the CATS transaction.

B.5 Power of Choice

The scope of Power of Choice refers to the system changes required due to implementation of the Power of Choice regulatory changes.

Description

The changes are regulatory driven.

Justification

Evoenergy must make the regulatory changes to remain compliant.

Status

The Power of Choice implementation occurred on the weekend 1-3rd December 2017

Benefits

Ensure that Evoenergy remains compliant with the new regulations

B.6 Minor IT

The scope of Minor IT expenditure include the following two projects:

- Replacement of Oniqua
- Integrated Vehicle Management System

Replacement of Oniqua

Description

IB 8 was raised for the replacement of Oniqua. Currently, the Oniqua Analytics Suite provides inventory forecasting and analysis tools. The existing application and hardware is out of support. An options analysis was conducted to identify the best course of action and determined that the solution should be replaced with Arkieva.

Justification

The optimisation of inventory levels at Evoenergy is critical to minimising costs and ensuring that critical stock items for reactive jobs are available. Arkieva utilises best practice inventory methodology to segment stock groups to better manage stock levels and costs.

Status

The project has commenced and is scheduled to conclude in 2018.

Benefits

The benefits of moving to an application that utilises stock segmentation is the ability to drive down stock levels through the use of varied service level agreements for different criticality of stock. The result is a reduction in stock costs.

Integrated Vehicle Management System

Description

IB 75 was raised for the implementation of an Integrated Vehicle Management System (IVMS). The project implements devices into the fleet vehicles that can navigate to the Evoenergy assets, and assist in sole worker safety.

Justification

The IVMS will manage driver and operator safety, increase business efficiency, reduce operating costs, and improve customer relationships and asset utilisation.

Status

The roll out of IVMS is completing in 2017.

Benefits

The safety benefits from the IVMS include utilisation of GPS capability for vehicles to ensure the security and safety of staff, and improved employee safety and driving behaviours through vehicle diagnostics and safety alerts. In addition, there are efficiency benefits including improvements to the maintenance schedule of vehicles and registration renewals, the removal of manual log books for FBT, asset and crew visibility for dynamic dispatch and faster response and improved GIS mapping content and asset navigation.

B.7 Riva

The expenditure is associated with the upgrade to the Riva system.

Description

IB 36 was raised to undertake an upgrade of the Riva application. The version of Riva utilised at Evoenergy was version 4.4.2 and was no longer supported by the vendor. The project was to upgrade to version 5.0.4

Justification

The upgrade was necessary to ensure that support was maintained by the vendor.

Status

The upgrade was implemented in Production in June 2017.

Benefits

The key benefit is the avoidance of additional costs from not having vendor support.

B.8 Outsystems

The scope of Outsystems include the following four projects:

- Implementation of a Retailer NMI Tool
- Implementation of internal tools
- Platform Upgrade
- Outsystems Cloud Migration

Implementation of a Retailer NMI Tool

Description

As part of the compliance rectification activities that occurred for market transactions in 2015, a need was identified for a Retailer NMI tool. This provided retailers a login to a special portal to look up information for NMIs where they are the designated Financially Responsible Market Participant (FRMP) to enable them to validate any data in their system using an automated process which pulls data from Evoenergy's core meter data and billing application, Velocity.

Justification

There was a need to provide the retailers additional information on NMIs without manual intervention from Evoenergy.

Status

This portal was implemented in 2015.

Benefits

The benefit is that retailers have access to additional information without having to request the information from Evoenergy staff.

Implementation of internal tools

Description

During the compliance activities undertaken in 2015, additional internal tools were developed for assisting with market activities. These tools were required to ensure compliance activities were as efficient as possible.

Justification

It is important for Evoenergy to ensure that compliance related activities are as efficient and accurate as possible. These tools have enabled improvements in this area.

Status

The tools were implemented in 2015.

Benefits

Ensure that Evoenergy compliance is maintained as efficiently and accurately as possible.

Platform Upgrade

Description

IB 62 was raised to conduct an upgrade on Outsystems to Version 10.

Justification

Since Outsystems is a customer facing portal to both retailers and end customers, stability is very critical. It is therefore necessary to ensure the application is kept up to date.

Status

The upgrade completed in February 2017.

Benefits

The benefit is meeting customers' expectations with regards to platform availability. The benefit of conducting the upgrade in February 2017 was the fact that the end customer portal was not in Production, allowing Evoenergy to conduct one upgrade as a learning experience with limited disruption to external parties for future upgrades which will be more time critical.

Outsystems Cloud Migration

Description

IB 26 was raised for the migration of the Outsystems platform from a cloud operated by a consulting organisation into an Evoenergy cloud. The project was instigated to have an environment that enables the development of business processes for utilisation and internal support capability to reduce reliance on external vendors to provide day-to-day support services.

Justification

The justification of this project was to ensure that the total cost of ownership of the Outsystems platform was reduced, by bringing the platform under Evoenergy control.

Status

The migration occurred in February 2017.

Benefits

The tools were previously in an environment and managed by a third party. Evoenergy wished to further explore the Outsystems technology for other uses, and the migration of systems into an Evoenergy controlled environment provides opportunities to develop internal knowledge and capability.

B.9 Productivity review

The scope of Productivity Review include the following projects:

- Scheduling Enhancement
- Mobility Roadmap
- Timesheet Efficiencies

Scheduling Enhancement

Description

IB 77 was raised to conduct scheduling enhancements. This project was approved by the Joint Venture Board in February 2017. The purpose of the scheduling project was to improve flexibility to respond real time, field crew labour productivity, reduced overtime and manual interventions and improvements in SAIDI.

Justification

The rationale approved by the Joint Venture Board is to improve flexibility to respond real-time on shift schedule changes, improved field crew labour productivity and reduced internal manual interventions and field crew overtime.

Status

The project has commenced and stage one, consisting of process only changes, will be implemented in early 2018.

Benefits

Improved scheduling process will be able to consolidate outages and improve worker utilisation.

Mobility Roadmap

Description

IB 76 was raised for the creation of an overall mobility strategy. This initiative was approved by the Joint Venture Board in February 2017.

Justification

There are further opportunities to develop the current mobile solution to further digitise workforce information.

Status

The project has commenced and will be completed in 2018.

Benefits

The ability to drive further mobility solutions based on an integrated and full mobility roadmap will provide a clear direction, ensuring that the solutions are robust for future requirements.

Timesheet Efficiencies**Description**

IB 91 has been raised to implement an efficient timesheet solution that enables approvals of who can book time to projects, and to remove the duplicate effort of booking overtime into two applications.

Justification

The current timesheet solution allows anyone to book time to any project, making it more difficult to track project costs of staff, since no approvals are required. In addition the duplication of entering overtime leads to inefficiencies in the operating process.

Status

The Business Case is underway to develop the solution.

Benefits

The benefits are in greater efficiencies in timesheet entry, and in monitoring project costs.