

# ICT Plan 2020-25

January 2019



Part of the Energy Queensland Group

## Executive Summary

This ICT Plan 2020-2025 summarises the Energex and Ergon Energy Information Communication Technology (ICT) proposals for the coming regulatory period, July 2020 to June 2025.

Both Energex and Ergon Energy rely on efficient ICT systems and services to deliver on their obligations as Distribution Network Service Providers (DNSPs) serving the Queensland community and customers. Until the current financial year, ICT services for Energex and Ergon Energy were provided by the companies' jointly owned subsidiary, SPARQ Solutions (SPARQ). More recently, the companies' ICT functions have been transferred to Energex and Ergon Energy's parent company, Energy Queensland Limited (EQL), enabling further efficiency and reduced duplication.

During this period, substantial progress has been made in the provision of efficient and capable ICT systems and processes. This includes:

1. **Further alignment of ICT delivery services** including support practices, service contracts, ICT planning and project delivery services;
2. **Compliance with new obligations** including as specified through the National Energy Customer Framework (NECF) and the Power of Choice (PoC) rule changes;
3. **Leveraging of existing ICT capability** for efficient provision of services to both companies at lower cost, including:
  - Establishment of the **Joint Energex and Ergon Energy Market Transaction Centre (JMTC)** using existing Customer Market System capability, enabling decommissioning of the ageing "FACOM" mainframe; and
  - Deployment of unified **Distribution Management System (UDMS)** network management capability across the Energex and Ergon Energy service areas based on the existing Energex "PowerOn" system.
4. Energex and Ergon Energy are also completing deployment of unified **Finance, Human Resource Management, Payroll, Procurement, Asset and Works Management** systems and business processes. This new integrated solution, known as Unified Enterprise Resource Planning and Enterprise Asset Management (Unified ERP EAM) will provide sustainable and secure core systems and consistent work practices across several key business functions.

Into the coming regulatory period, Energex and Ergon Energy will focus on ICT as an enabler of business performance consistent with the following ICT strategic themes.

### ICT Strategic Themes

1. Maintain systems for sustainability, cybersecurity and operational safety
2. Leverage ICT replacements for digital transformation, enabling Energex and Ergon Energy's productivity improvement targets
3. Maintain efficient ICT performance in a rapidly changing technology environment
4. Leverage innovative technologies and techniques for efficiency and customer service

Energex and Ergon Energy will continue to maintain ICT systems and capability consistent with established ICT asset lifecycle management practices. Upon replacement of key systems, the

companies will take the opportunity to consolidate and rationalise legacy applications with consistent best-practice business processes across the service regions.

This digital transformation will enable realisation of Energex and Ergon Energy's forecast 10% reduction in indirect costs and 3% improvement in program of work delivery. This outcome will be achieved through process and capability optimisation, including:

- Accuracy of data capture at source, reducing the need for rework;
- Improved data mastering, with reduced duplication and data synchronisation complexity;
- Aggregation of workload for improved work throughput, consistency and resource utilisation;
- Improved work scheduling and automated dispatch;
- Improved analysis of geo-spatial, network and non-network data for improved forecasting and planning;
- Continuous improvement in asset management through ISO55000 practices, with combined Energex and Ergon Energy insights and network intelligence;
- Ability to tailor asset management and works program delivery to the local requirements of particular network segments;
- Opportunity to reduce or defer capital investment through better analysis of energy usage, targeting of demand management programs and use of non-network alternatives; and
- Reduced complexity associated with support of highly aged, custom developed applications requiring specialist skills.

The planned ICT program will also enable a series of key non-financial benefits including:

- Sustainment of Energex and Ergon Energy's business systems and technology infrastructure for ongoing supportability, cybersecurity, compliance and operational safety;
- Safety risk mitigation through accurate network data and consistent work practices across the Energex and Ergon Energy regions, including during emergency events;
- Application of necessary cybersecurity controls for access to information related to critical infrastructure and privacy of customer data.
- Improved network operational resilience and continuity through Operational Control Centre (OCC) fail-over capability between the Energex and Ergon Energy regions;
- Ability to meet the community's "open data" expectations for access to accurate and timely data regarding the corporations' assets;
- Agility in responding to ongoing regulatory, compliance and technology changes, building upon the existing information intelligence architecture; and
- Compliance with all legislative and regulatory obligations, including market obligations, reporting obligations, safety requirements and conformance with prescribed standards.

Energex and Ergon Energy apply continuous improvement techniques to maintain ICT efficiency in an environment of growing complexity and technology demand. This efficiency is enhanced through the prudent use of market services and cloud software, with onshore hosting of critical systems and data.

Priority is also placed on the electronic security ICT systems, information and infrastructure in an environment of increasing cyber risk. Energex and Ergon Energy will maintain a high level of cybersecurity vigilance and C2M2 maturity, compliant with all DNSP obligations including as may be identified through the new AEMO Cyber Security Industry Working Group.

### Document Tracking Details

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## 1. Introduction

Energex and Ergon Energy have a positive track record in the effective use of Information Communication Technology (ICT), enabling efficient business operations and transformational change.

As the companies look toward the future, ICT systems and capability must be maintained for sustainability, cybersecurity, compliance and operational safety. Planned technology replacements will also be leveraged to enable Energex and Ergon Energy's planned productivity improvement.

This ICT Plan 2020-2025 summarises the Energex and Ergon Energy ICT proposals for the coming regulatory control period, July 2020 to June 2025.

The sections which follow describe:

- The **Strategic Themes** underpinning Energex and Ergon Energy's ICT plans for the coming period;
- The **ICT Asset Lifecycle Management** practices used to maintain and sustain Energex and Ergon Energy's ICT capability;
- Energex and Ergon Energy's approach to **Cybersecurity Management**;
- **ICT Expenditure Summaries** for the current and forecast period; and
- The planned **ICT Program** for the forecast period.

## 2. ICT Strategy

Energex and Ergon Energy recognise ICT as a key enabler of efficient business operations, customer service and safety management. This section summarises the companies' ICT strategy in the form of four strategic themes supporting our business purpose (Figure 1).

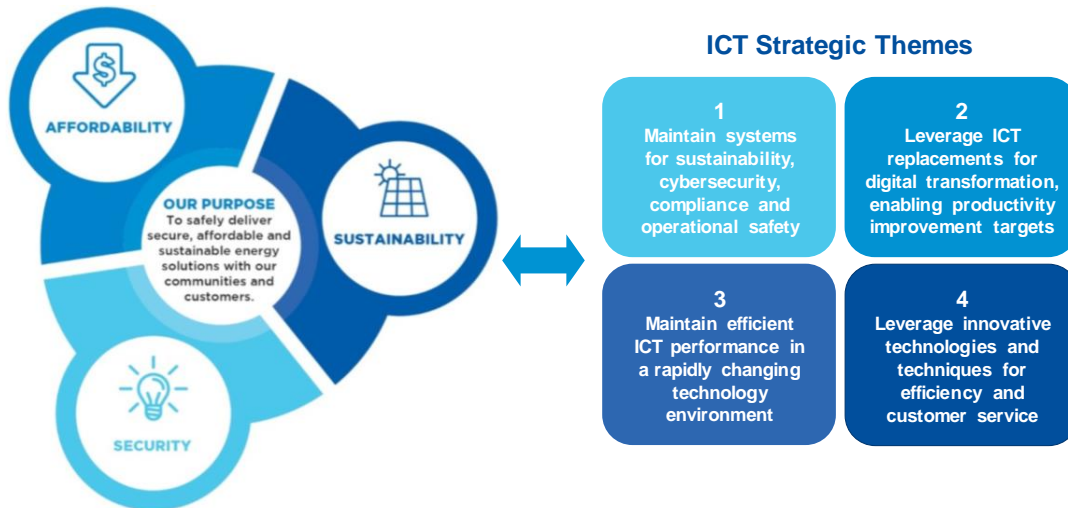


Figure 1: ICT Strategic Themes

### 2.1 Maintain systems for sustainability, cybersecurity and operational safety

ICT systems and infrastructure are operational assets that require maintenance, upgrade and replacement on a cyclic basis, consistent with prudent asset lifecycle management practices. Maintenance, upgrade and replacement plans are assigned for each ICT asset with considerations including:

- Asset categorisation (e.g. core “systems of record” which are maintained over a long period versus short-cycle “systems of differentiation” where change is rapid)
- Operational risks and mitigation opportunities
- Cybersecurity threats and response plans
- Economic and service improvement benefits

The majority of Energex and Ergon Energy’s planned ICT capital investment program is representative of this form of cyclic asset management. For more information on Energex and Ergon Energy’s approach to ICT Asset Lifecycle Management, see section 3.

Cybersecurity is also a growing threat for critical infrastructure providers, including Australia’s DNSPs. In 2017, the Australian Chief Scientist Alan Finkel handed down the “Independent Review into the Future Security of the National Electricity Market”, which considered the risks associated with Australia’s electricity supply and operations. As a result of the Finkel review, the Australian Energy Market Operator (AEMO) has elevated the focus on the cybersecurity of Australia’s electricity supply and distribution infrastructure, together with the newly formed Australian Cyber Security Centre (ACSC) in Canberra.

Energex and Ergon Energy must maintain appropriate cybersecurity controls and processes such that infrastructure is maintained within an appropriate risk posture and that customer information privacy is ensured.

For more information regarding Energex and Ergon Energy's focus on Cybersecurity Management, see section 4.

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*"Energex and Ergon Energy's ICT systems are maintained according to prudent asset lifecycle management practices, with considerations of the technology category, risks and opportunities for economic and service improvement"*

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## **2.2 Leverage ICT replacements for digital transformation, enabling Energex and Ergon Energy's productivity improvement targets**

While it's essential that ICT systems are prudently maintained, replacements also represent a significant opportunity to improve the effectiveness of business operations.

Replaced systems typically have improved capabilities which enable the business to operate more efficiently or effectively.

System replacement also provide the opportunity to retrain our people with new processes to optimise productivity.

Energex and Ergon Energy will therefore leverage the planned ICT system replacements as the basis of a Digital Transformation of the companies' processes and practices.

This transformation of systems and processes will enable the forecast 10% reduction in indirect costs and 3% improvement in program of work delivery.

The box to the right indicates key efficiencies enabled through the Digital Transformation.

For further information on these and other planned productivity improvements and benefits, see the individual ICT initiatives described in section 5.4.

### **Digital Transformation Efficiencies**

- Simplified workflows and accurate data capture at source
- Reduced rework, duplication and data synchronisation complexity
- Better resource utilisation across Energex and Ergon Energy
- Improved analytics for better forecasting and investment plans
- Improved ISO55000 asset management with greater network intelligence and insights
- Tailored asset and works plans based on local network needs
- Improved targeting of demand management and non-network solutions
- Reduced ICT support complexity
- Improved work productivity, through access to the right information at the right time

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*"Energex and Ergon Energy are focussed on delivering operational efficiency and productivity through ICT Digital Transformation, while maintaining our systems for risk mitigation and security"*

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## **2.3 Maintain efficient ICT performance in a rapidly changing technology environment**

Energex and Ergon Energy continuously assess the opportunity to improve ICT efficiency in an environment of growing complexity, cybersecurity risk and technology demand. Integration of the ICT functions previously provided by SPARQ into the core operational business has further enabled governance efficiencies and reduced the duplication of corporate business functions.

Cloud services and market-provisioned solutions are widely used by Energex and Ergon Energy. Examples include the contact centre interactive voice response (IVR) and telephony solution, transition to public data centre hosting and the shift from expensive “ruggedised” laptop PCs in the field to lower cost tablets and equivalent devices.

As-a-service infrastructure, platforms and solutions continue to mature at a rapid rate, providing efficient alternatives to internally owned and operated options. Prior to each investment, Energex and Ergon Energy consider the most appropriate ICT service provisioning option including use of Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) alternatives. This “ICT-as-a-Service Investment Decision Framework” considers factors including:

- Overall total cost of ownership of the alternative service provision models;
- Costs of managing stranded assets (hardware and software licences) and possible staffing implications and costs;
- Procurement options; and
- Cybersecurity, information privacy and data sovereignty policy requirements.

For more information on the “ICT-as-a-Service Investment Decision Framework”, see Appendix A.

## **2.4 Leverage innovative technologies and techniques for efficiency and customer service**

Technology advances are rapid in the modern world. Over the past decade, society has been transformed by digital, mobile and connected services. Innovations in the use of technology for improved electricity utility management are also maturing at an ever accelerating rate.

Today, the tools and techniques exist to deliver step changes in network reliability and performance through detailed network node monitoring, power flow analysis and self-healing grids.

Improvements in asset management are driven by the use of “big data” tools and artificial intelligence capabilities, enabling predictive analysis for targeted maintenance and investment planning. Integrated customer and stakeholder interaction capability also provides an “omni-channel” experience when engaging with the community.

Maturing ICT program delivery practices, including “Agile” methods and professional program delivery management, mitigate delivery risks and optimise project delivery efficiency.

Energex and Ergon Energy see innovation as an opportunity to improve our efficiency and service effectiveness. We’ve taken great steps in recent years. Examples include use of:

- Electronic Distribution Management Systems (DMS) for improved network control, switching and outage management;
- Mobile Field Force Automation (FFA) solutions for improved work scheduling, despatch and execution efficiency; and

- Enterprise Intelligence solutions, providing operational data insights and performance improvement.

Our planned ICT program for the coming period continues to build on that foundation of improvement.

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*“Energex and Ergon Energy see innovation as an opportunity to improve our efficiency and service effectiveness. Through our program of ICT replacement and digital transformation we’re delivering on that strategic theme”*

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### 3. ICT Asset Lifecycle Management

Energex and Ergon Energy categorise ICT assets as either “application assets” or “infrastructure assets”. Assets within these categories are managed in accordance with ICT Asset Lifecycle Management guidelines which specify the planned upgrade and replacement cycles for individual asset classes.

#### 3.1 Application Asset Lifecycle Management

The ICT application asset lifecycle aligns with and supports three primary business drivers:

- **Lowering the cost of operating ICT** over time through the consolidation of like systems and using commercially available products and web services to replace in-house developed legacy systems;
- **Supporting higher levels of business productivity** through prudent investment in modern ICT systems that support new ways of working such as higher levels of work automation, better insights to support timely business decisions, and providing timely information to maintain reliability and quality of electricity supply; and
- **Maintaining an acceptable level of “technology debt”** which maintains applications at a prudent level of currency.

ICT application assets within Energex and Ergon Energy are classified using the Gartner “PACE Layer” model. Table 1 below summarises the PACE Layer model, describing the characteristics of applications within each layer and the investment lifecycle guidelines which apply.

Application Asset Lifecycle Management Guidelines	
“ICT System of Record”	Investment Lifecycle
<p>Key defining criteria for Systems of Record include that:</p> <ul style="list-style-type: none"><li>• They support core business processes – “running the business”</li><li>• The business process is understood and stable (either common or subject to regulatory requirements)</li><li>• They contain information that is core to the business (key information entities – system of record)</li><li>• They have high data integrity requirements (need to be auditable)</li><li>• They are an information source for other systems through exposing business services</li></ul>	<p>On this basis, the guidelines forecast that Systems of Record should maintain currency, supportability and effectiveness through the following investment lifecycle.</p> <ul style="list-style-type: none"><li>• Minor Upgrade – 3 years after implementation</li><li>• Major Upgrade – 7 years after implementation</li><li>• Replacement – 12 years after implementation</li></ul>
“ICT Systems of Differentiation”	Investment Lifecycle
<p>Key defining criteria for Systems of Differentiation include that:</p> <ul style="list-style-type: none"><li>• They support a differentiating and/or new business process</li><li>• Business process is understood but dynamic (improving ways to deliver existing outcomes).</li><li>• They use information that is core to the business and other information that is sourced externally or generated as part of the process.</li><li>• There are moderate data integrity requirements.</li></ul>	<p>On this basis, the guidelines forecast that Systems of Differentiation should maintain currency, supportability and effectiveness through the following investment lifecycle.</p> <ul style="list-style-type: none"><li>• Minor Upgrade – 2 years after implementation</li><li>• Major Upgrade – 5 years after implementation</li><li>• Replacement – 7 years after implementation</li></ul>

Application Asset Lifecycle Management Guidelines	
“ICT Systems of Innovation”	Investment Lifecycle
<p>Key defining criteria for Systems of Innovation include that:</p> <ul style="list-style-type: none"> <li>• They support a new or evolving business processes (i.e. they “innovate the business”)</li> <li>• The business process is developing, ambiguous and dynamic (e.g. a new opportunity / idea or a new way to execute)</li> <li>• They use information that is core to the business (key information entities) and other information (e.g. external or new)</li> </ul>	<p>On this basis, the guidelines forecast that Systems of Innovation should maintain currency, supportability and effectiveness through the following investment lifecycle.</p> <ul style="list-style-type: none"> <li>• Minor Upgrade – N/A</li> <li>• Major Upgrade – N/A</li> <li>• Replacement – 1 year after implementation</li> </ul>
<p><b>Upgrade and Replacement investments also consider the extent of “obsolescence” of the solution.</b> For example</p> <ul style="list-style-type: none"> <li>• Technical Obsolescence – The solution is still functional but not supportable</li> <li>• Financial Obsolescence – The cost of maintaining the solution outweighs the value derived from it</li> <li>• Asset Obsolescence – The asset has reached the end of its reasonable functional life as indicated through failure rates, and/or inability to meet business requirements</li> </ul>	

**Table 1: ICT Application Asset Lifecycle Management Guidelines**

## 3.2 Infrastructure Asset Lifecycle Management

Energex and Ergon Energy apply ICT Infrastructure Asset Lifecycle Management practices to ensure:

- **ICT systems and platforms remain available and supportable.** This is achieved by maintaining hardware, operating systems, database management systems and other infrastructure at a level of version-currency that retains vendor support or equivalent third-party support;
- **ICT cybersecurity and information privacy are maintained** within an appropriate risk posture through application of vendor supplied security patches and system hardening for networks, systems and platforms based on assessment of risk; and
- **Optimised cost effectiveness of ICT infrastructure asset ownership** through asset lifecycle management based on both “age” and assessment of forecast “obsolescence”.

The ICT Infrastructure Asset Lifecycle Management Guidelines define asset maintenance and replacement actions for infrastructure within the following classes:

- End User Devices;
- Windows Servers;
- Unix Servers;
- Tape Storage;
- Disk Storage;
- Corporate Data Network Infrastructure; and
- Technology Software (including operating systems, security software, appliances and externally facing technology software)

Replacement cycles for the each of the infrastructure classes is detailed in Appendix C.

## 4. Cybersecurity Management

As DNSPs, Energex and Ergon Energy have an obligation to maintain cybersecurity risk management solutions at a level appropriate to the operation of critical infrastructure assets, maintaining customer information privacy and providing essential services to the community.

As the sophistication of external and internal threats increase, Energex and Ergon Energy must maintain the capability to detect and prevent unauthorised penetration of their networks, malicious attacks and leakage of information.

Today, the threats of cyber-attack are growing rapidly. Targeted and untargeted attacks from intentional criminal organisations and nation states have the potential to disrupt electricity networks and market operations. Cybersecurity exposure may be elevated through human error, software updates, maintenance procedures, inadequate testing and equipment failures, while actions of malicious actors can target known vulnerabilities.

In 2018, AEMO has established the Cyber Security Industry Working Group (CSIWG) with the intention to develop an Australian energy sector cybersecurity framework. The new working group will work in conjunction with the Department of Home Affairs and the Australian Cyber Security Centre (ACSC) and the Australian Signals Directorate (ASD).

It is planned that the framework will be used by market participants, including DNSPs such as Energex and Ergon Energy, to actively monitor and maintain appropriate cybersecurity maturity and to prioritise cybersecurity investments.

Energex and Ergon Energy's ICT program for the coming regulatory period anticipates the growing requirements for maintenance and improvement of the companies' cybersecurity systems and processes. This is partly represented as a specific investment in cybersecurity tooling replacement (see section 5.4.5). However more broadly, Energex and Ergon Energy will use the opportunities presented through each planned business system upgrade and replacement to ensure that renewed systems and infrastructure are appropriately hardened to mitigate their respective risk exposures.

As noted recently by Energy Networks Australia (ENA), "Cybersecurity is not a static goal to be achieved; cybersecurity is an ever-evolving commitment that requires ongoing vigilance". Energex and Ergon Energy also share this perspective and continued commitment, with a risk based approach to cybersecurity threat assessment, management and response.



## 5. ICT Capital Expenditure

Energex and Ergon Energy manage delivery of ICT capital expenditure through a coordinated program of investments. This section summarises the forecast ICT capital expenditure, the program roadmap and the key benefits enabled by the planned initiatives.

### 5.1 Expenditure Summary

Figure 2 and Table 2 indicate the total Energex ICT program expenditure for the current and coming regulatory control periods. The values represent the full ICT capital expenditure (SCS+ACS 2020 Real) for the DNSP.

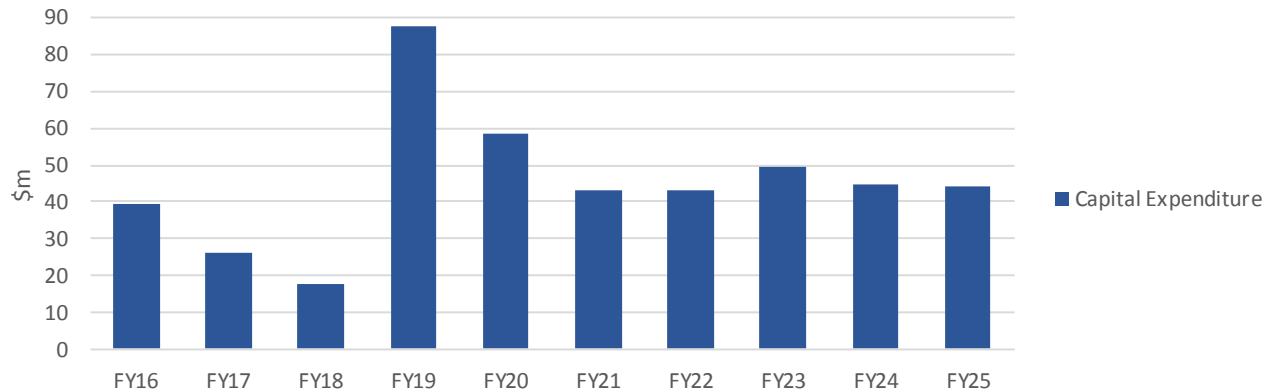


Figure 2: ICT Program Expenditure (Energex)

Energex - \$m 2019/20	FY16-25 Expenditure Profile (\$m)											
	FY16	FY17	FY18	FY19	FY20	Syr Total	FY21	FY22	FY23	FY24	FY25	5yr Total
Asset Extension	6.35	6.48	1.61	13.02	9.45	36.92	2.76	2.56	1.95	2.84	2.86	12.96
Asset Remediation	0.40	0.03	0.01	1.51	0.26	2.21	0.64	0.59	0.45	0.65	0.66	2.99
Asset Replacement	18.87	16.57	4.86	61.24	42.93	144.48	35.35	35.69	42.24	36.80	36.27	186.35
Capability Growth	13.96	2.86	11.02	11.81	5.76	45.40	4.48	4.41	5.06	4.52	4.49	22.96
<b>ICT Capital Expenditure Total</b>	<b>39.58</b>	<b>25.94</b>	<b>17.50</b>	<b>87.58</b>	<b>58.40</b>	<b>229.01</b>	<b>43.22</b>	<b>43.25</b>	<b>49.70</b>	<b>44.81</b>	<b>44.28</b>	<b>225.25</b>

Table 2: ICT Program Expenditure (Energex)

Figure 3 and Table 3 indicate the Ergon Energy ICT program expenditure for the current and coming regulatory control periods. The values represent the full ICT Capex expenditure (SCS + ACS 2020 Real) for the DNSP.

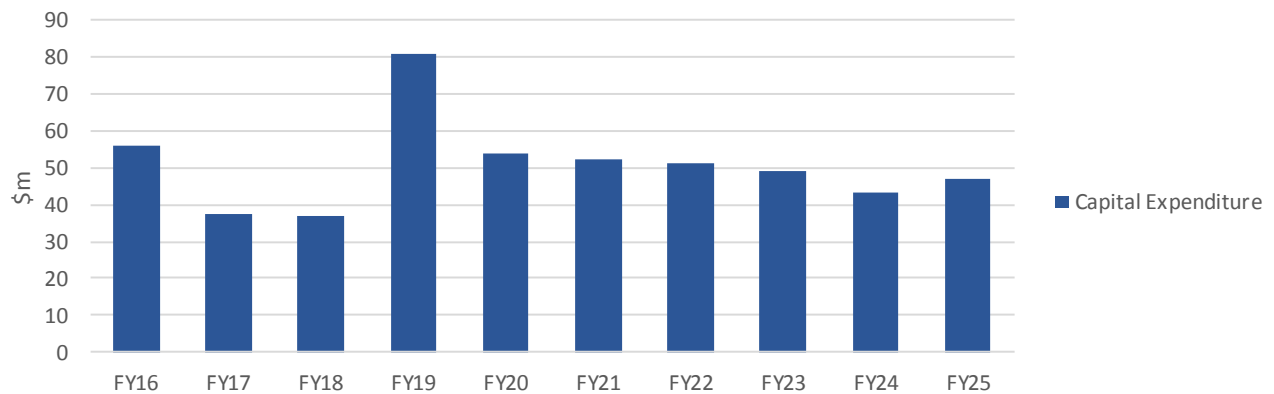


Figure 3: ICT Program Expenditure (Ergon Energy)

Ergon Energy - \$m 2019/20	FY16-25 Expenditure Profile (\$m)											
	FY16	FY17	FY18	FY19	FY20	5yr Total	FY21	FY22	FY23	FY24	FY25	5yr Total
Asset Extension	1.76	1.88	1.64	6.31	5.99	17.57	2.32	2.26	1.58	3.13	2.37	11.66
Asset Remediation	0.40	0.03	0.78	2.51	3.13	6.85	0.54	0.52	0.36	0.72	0.55	2.69
Asset Replacement	40.23	19.61	23.78	61.19	39.63	184.44	44.19	43.61	42.41	35.32	39.64	205.18
Capability Growth	13.76	16.06	10.94	10.79	5.05	56.61	5.45	5.31	5.08	4.45	4.86	25.15
<b>ICT Capital Expenditure Total</b>	<b>56.16</b>	<b>37.58</b>	<b>37.13</b>	<b>80.81</b>	<b>53.79</b>	<b>265.47</b>	<b>52.50</b>	<b>51.71</b>	<b>49.43</b>	<b>43.63</b>	<b>47.42</b>	<b>244.68</b>

**Table 3: ICT Program Expenditure (Ergon Energy)**

## 5.2 AER ICT Asset Categories

The ICT program comprises investments across the four AER ICT asset categories as summarised in Table 4 below.

AER ICT Category	AER Definition	Energex and Ergon Energy investment types	% of ICT Capex	
			Energex	Ergon Energy
ICT Asset Extensions	The extension of existing ICT assets to broaden its functionality.	Continuous improvement and enhancements to existing ICT assets to support ongoing alignment with business and market requirements.  Investment is estimated as a portion of forecast upgrades and minor change, representing functional extensions and other enhancements.	5.8%	4.8%
ICT Asset Remediations	The correction or optimisation of the performance of existing ICT assets that are not performing to the required service performance requirement.	ICT changes and repairs to remedy operational issues, including functional corrections, performance issue resolution and data rectifications.  Investment is estimated as a portion of forecast upgrades and minor change, representing expenditure to enable optimal ICT operation to meet service requirements.	1.3%	1.1%
ICT Asset Replacements	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.	Cyclic upgrades and replacements aligned with Energex and Ergon Energy's ICT Digital Asset Management Guidelines to ensure ongoing sustainability, cybersecurity and operational safety.  Investments are forecast based on these guidelines and in support of achieving the proposed productivity improvements.	82.7%	83.8%
ICT Capability Growth	The acquisition, development and implementation of new ICT assets to meet a business purpose or capacity requirement.	A portion of planned expenditure representing improvements in capability enabled through cyclic upgrades and replacements or significant business improvement and transformational initiatives.  Also includes investment required for compliance with new legislative and/or regulatory obligation and expenditure to accommodate capacity growth requirements.	10.2%	10.3%

**Table 4: AER ICT Asset Categories**

### 5.3 ICT Program Roadmap

The ICT Program Roadmap (Figure 4 over page) identifies the planned ICT investments for the coming regulatory period. It also indicates key investments planned for completion in the remainder of the current period.

The investments have been grouped within a set of seven roadmap segments. Section 5.4 further describes each roadmap segment, summarising:

- The supported business functions and existing systems
- The planned ICT initiatives and corresponding benefits enabled
- Other forecast minor upgrades and updates

Individual cost estimates for each planned initiative are provided in Appendix D.

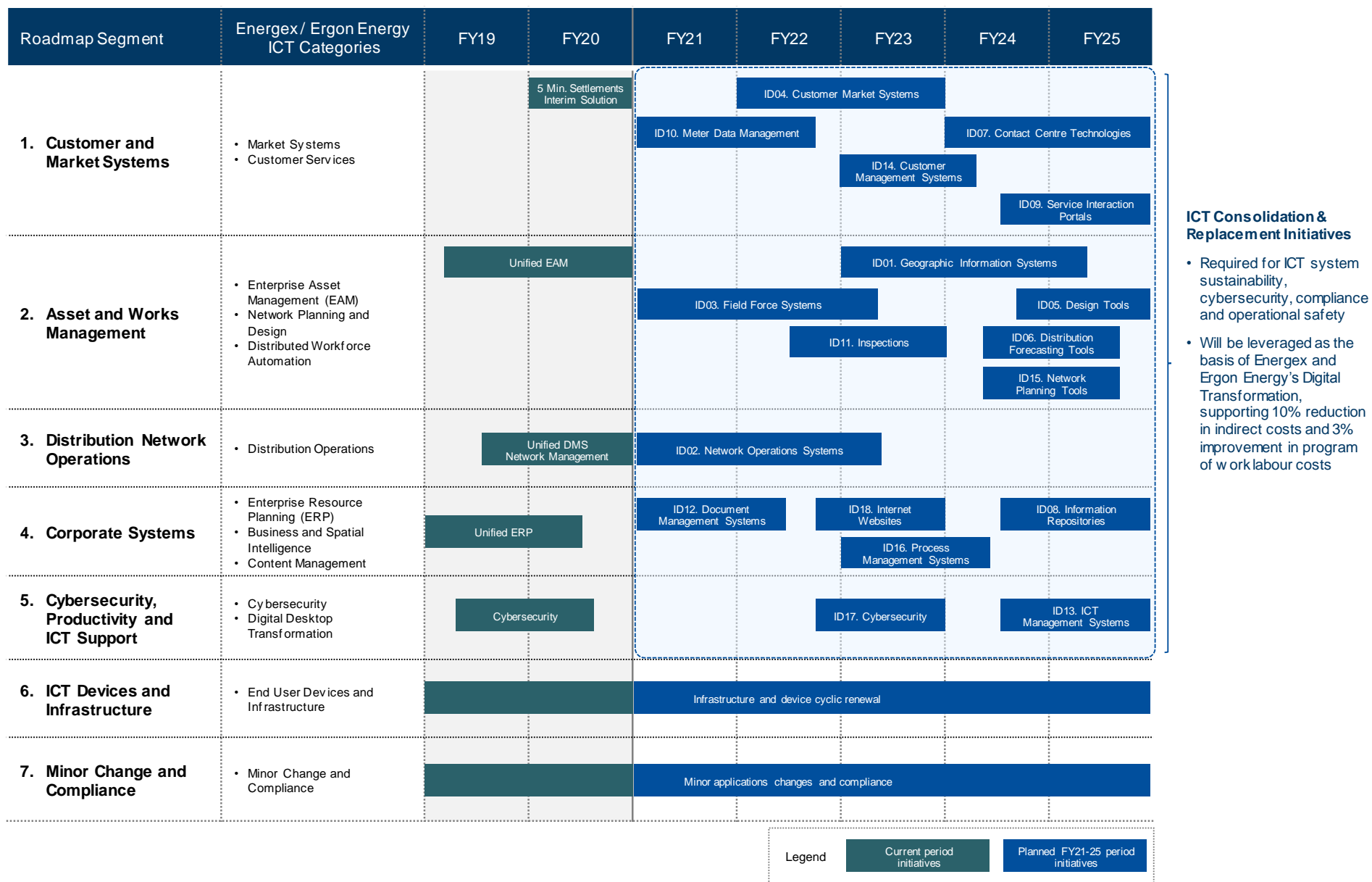


Figure 4: ICT Program Roadmap

## 5.4 ICT Program Investments

The sections below summarise the key planned investments in each segment identified within the ICT Program Roadmap.

### 5.4.1 Roadmap Segment 1: Customer and Market Systems

Customer and Market Systems include ICT applications, tools and data stores to support Energex and Ergon Energy's market compliance, customer and stakeholder management functions as described in Table 5.

Category	Business Functions	Existing ICT systems	
		Energex	Ergon Energy
Market Systems	Market standing data management		
	Customer information management	PEACE	PEACE
	Connection point management	Shine	Shine
	Service order management	MARS	MARS
	Retailer invoicing and remittance management		
	Type 6 meter data management	DXC Toht	DXC Toht
	Interval meter data management	iTron MVRS	GT FMC
	Market gateway	Utilisoft	Utilisoft
Customer Services	Contact Centre Services	Optus CCT	Optus CCT
	Service Interaction Management	Custom Portals	Custom Portals
	Customer management	Cherwell	Cherwell SLIM, PLUMS

**Table 5: Roadmap Segment "Customer and Market Systems" Business Functions**

Prior to the coming regulatory control period, the following key works are underway or planned:

- **5 Minute Settlements Interim Solution** - Interim solutions to enable limited transition to 5 minute settlements are being explored. A sustainable solution will be implemented in the coming regulatory period leveraging the planned Meter Data Management and Customer Market Solution initiatives (business case references: ID10 and ID04).

Planned initiatives in the coming regulatory period are itemised in Table 6 (over page).



**Meter Data Management Consolidation and Replacement** (Business Case Ref: ID10)

**Overview** In the context of Meter Data Management (MDM) there are two functions that a DNSP in the National Electricity Market must perform:

- Management and processing of Type 6 meter data in the role of Meter Data Provider (MDP); and
- Management of interval meter data in the role of Local Network Service Provider (LNSP) to facilitate production of network bills.

The core technology platform supporting the MDM functions of Energex and Ergon Energy consists of the Toht solution supplied by the vendor DXC, the MVRS solution supplied by Itron and the FMC solution supplied by Geomatic Technologies (GT).

Toht provides the ability to manage meter data received from other market participants (Type 1-4 meters) to support the network billing function. Toht also supports validation, estimation, substitution, aggregation and publication of Type 6 meter data provided by the DNSPs' Type 6 metering functions.

Due to the small base of Toht customers, the costs of maintaining regulatory compliance within the product are largely borne by Energex and Ergon Energy.

It is forecast that Energex and Ergon Energy's existing MDM solutions will not be able to handle the increased data volumes driven by a larger deployed base of smart meters and further regulatory changes. e.g. 5 minute interval data.

Through this planned investment, the separate Energex and Ergon Energy Toht implementations will be replaced with a consolidated solution, subject to conformance with security, privacy and ring-fencing obligations. Meter reading solutions will also be renewed where necessary and aligned across Energex and Ergon Energy.

**Benefits Enabled** **Productivity and Efficiency Benefits**

Market Operations Productivity

- Reduced manual intervention in meter data validation, substitution and estimation activities
- Reduced number of queries from the market in relation to published meter data

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies' MDM capability for ongoing supportability, cybersecurity and operational safety

Compliance

- Sustainable compliance with Energex and Ergon Energy's obligations as DNSPs operating in the National Electricity Market, including obligations regarding 5 minute metering

Customer

- Accuracy and timeliness of customer meter reading management, ensuring corresponding accuracy in network billing of retailers, and indirectly, customer retail billing

Reputation

- Energex and Ergon Energy's reputation is maintained in the NEM through provision of accurate and timely meter data

**Customer Market Solution Consolidation and Replacement** (Business Case Ref: ID04)

**Overview** Customer information and market interaction systems are critical enablers of Energex and Ergon Energy's efficient operations as DNSPs in the National Electricity Market. These systems provide the core capability for participant interactions within the market and corresponding processing of CATS and B2B transactions.

The Hansen PEACE solution was implemented for Energex to provide these capabilities and to meet the July 2007 Full Retail Contestability (FRC) market opening in Queensland. In the current regulatory period, an independent instance of the Hansen PEACE solution was implemented for Ergon Energy, based on the existing Energex system configuration.

The current PEACE solution for each company provides the following functionality:

- Market standing data management (e.g. NMI, Meter, Network Tariffs);
- Customer information management;
- Connection point management;
- Service order management;
- Meter reading route management (type 6); and
- Retailer invoicing/remittance/reconciliation (NMI level).

At the commencement of the coming regulatory period (July 2020), the current Hansen PEACE solution will have been in operation for 13 years. Given the life of the current solution, its criticality to market operations and the lack of a clear long-term product roadmap, a replacement solution will be required.

This Customer Market Solution replacement is required to provide a supportable and sustainable capability to service the Energex and Ergon Energy distribution businesses in fulfilling their market obligations.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Market Operations Productivity

- Better resource utilisation through alignment of processes and allocation of resources across the shared Energex and Ergon Energy Market Operations function

Compliance Effectiveness

- Agility and synergy in responding to changes in market rules transaction specifications

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies' Customer Interaction and Market Management Solutions for ongoing supportability, cybersecurity and operational safety

Compliance

- Sustainable compliance with Energex and Ergon Energy's obligations as DNSPs operating in the National Electricity Market, including obligations regarding 5 minute metering

Customer

- Accuracy and timeliness of customer service order management
- Agility which allows Energex and Ergon Energy to be more responsive to changing customer expectations

Reputation

- Energex and Ergon Energy's reputations are maintained in the NEM through efficient and accurate market interaction management

**Contact Centre Technologies Consolidation and Replacement** (Business Case Ref: ID07)

**Overview** Energex and Ergon Energy use multiple channels to engage with their distribution customer base, including telephony, Interactive Voice Response (IVR), SMS, social media and internet websites. Customers rely heavily on telephony-based interaction through the IVR service and direct engagement with customer service agents. The telephony-based channel handles over 800,000 customer contacts per annum across the combined distribution customer base (based on FY18 data).

The core technology platform supporting the telephony-based customer interaction is the Contact Centre Technology (CCT) solution. The current CCT solution is provided as a "private cloud" Software-as-a-Service (SaaS) arrangement. The CCT solution provides the following functionality for the distribution businesses:

- Call handling for 13 and 1300 telephony traffic
- IVR services for customer outage information (both planned and unplanned)
- Contact Centre agent based services
- E-mail customer service interactions
- Integration with social media channels
- Web Chat customer service option
- Contact Centre workforce planning and scheduling
- Call and customer interaction analytics and reporting

The technology set upon which the CCT solution is based (Cisco + Nice) will require replacement during the FY21-25 regulatory period, which also aligns to the end of the SaaS arrangement with Optus.

This investment therefore primarily responds to the need for a supportable and sustainable contact centre platform to service the Energex and Ergon Energy distribution customer base.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Market Operations Productivity

- Better resource utilisation through alignment of processes and allocation of resources across the shared Energex and Ergon Energy Market Operations function

Compliance Effectiveness

- Agility and synergy in responding to changes in market rules transaction specifications

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies' Customer Interaction and Market Management Solutions for ongoing supportability, cybersecurity and operational safety

Compliance

- Sustainable compliance with Energex and Ergon Energy's obligations as DNSPs operating in the National Electricity Market, including obligations regarding 5 minute metering

Customer

- Accuracy and timeliness of customer service order management
- Agility which allows Energy Queensland to be more responsive to changing customer expectations

Reputation

- Energex and Ergon Energy's reputations are maintained in the NEM through efficient and accurate market interaction management

**Service Interaction Portals Consolidation and Replacement** (Business Case Ref: ID09)

**Overview** The Service Interaction Portals (SI Portals) used by Energex and Ergon Energy provide web browser based self-service capability to support efficient distributor operations in the National Electricity Market. The capability was initially introduced for electrical works requests and has been progressively expanded to support broader distributor interactions with customers, electrical service providers and retailers.

The self-service capability is enabled through portal applications accessed via the respective Energex and Ergon Energy websites. The SI Portals were implemented in March 2011 and are key platforms enabling the distributors' compliance with the National Energy Customer Framework (NECF) and Power of Choice (PoC) reform initiatives.

The SI Portals provide the following self-service capabilities to customers, contractors and retailers:

- Customer SI Portal
  - View connection status
  - View service order status
  - Maintain customer details
  - Register a Guaranteed Service Level (GSL) claim
  - Register tree trimming request
  - Report street light outages and other events
- Electrical Contractor / Service Provider SI Portal
  - Initiate connection requests
  - Initiate solar photo-voltaic (PV) requests
  - View service order status
  - View service order history
  - Notify of Service Order status change
- Retailer SI Portal
  - National Metering Identifier (NMI) enquiry
  - View service order status
  - View outage information

Given the rapid change of internet technologies and growing cybersecurity privacy threats, the SI Portals will need to be replaced or redeveloped before the end of the coming regulatory control period (2025). This investment therefore primarily responds to the need for an ongoing supportable and secure platform to service the Energy Queensland distribution customer base.

This investment will replace the SI Portals with a unified solution using contemporary technology. It will also leverage associated "back-end" solution replacements to support consistent Energex / Ergon Energy business processes.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Compliance Productivity

- Agility and synergy in responding to changes in market processes
- Provision and use of self-serve capability enables productivity improvement through first-response automation

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies' SI Portals for ongoing supportability, cybersecurity and operational safety

Technology Advances

- Flexibility in enabling customer and stakeholder engagement through new and changing technologies. This includes customer and stakeholder expected support for smartphones, voice activated home assistants, 5g networks, web browsers and next generation

technologies which gain prevalence in the coming 7 years

### Customer

- Agility, enabling Energex and Ergon Energy to be more responsive to changing customer interaction demands and expectations

### Electrical Partners & Retailers

- Agility, enabling Energex and Ergon Energy to be more responsive to changing business practices

## Customer Management Systems Consolidation and Replacement (Business Case Ref: ID14)

**Overview** Since the opening of the National Electricity Market and through subsequent market reforms, DNSPs’ have typically transitioned to a form of NMI/connection centricity. This has led to a reduction in direct connectedness with the customer.

While the Customer Market Solutions (i.e. Hansen PEACE, Shine etc) support the transactional operation of the NEM, it is the Customer Management Systems (CMS) that maintain a holistic view of the overall energy and non-energy customer interactions and relationships with the DNSP. Recent surveys and research have highlighted the imperative for DNSPs to engage closely with their customers and community groups.

The CMS brings together customer interaction information from the various channels (phone, web chat, SMS, email, and other social media) to provide context to current and future engagements. It is playing an increasingly important role in ensuring the customer is the focus of our business as the market continues to evolve and new products and services are incorporated into the distribution network ecosystem.

This investment responds to the need for a supportable and sustainable platform to service the Energex and Ergon Energy distribution customer base, providing a unified customer information source to empower future customer engagements. In addition, the initiative will address the increasing customer service expectations that drive the need for a more integrated suite of service channels and deliver on the core tenet of Energex and Ergon Energy’s Customer Strategy - “the customer needs to be the focus of everything we do”.

Through this business case proposal, the separate legacy Energex and Ergon Energy Customer Management Solutions will be replaced with a unified solution, subject to conformance with security, privacy and ring-fencing obligations.

### Benefits Enabled

#### Productivity and Efficiency Benefits

##### Compliance Productivity

- Agility and synergy in responding to changes in market processes
- Improved functionality and ease of use for staff, customers and partners will improve customer experience, support cost to serve reductions and more efficient interaction handling
- Reduced cost to serve due to automation provided by “push” type communications with customers

#### Non-Financial Benefits

##### ICT Asset Management

- Sustainment of the companies’ CMS for ongoing supportability, cybersecurity and operational safety

##### Technology Advances

- Flexibility in enabling customer and stakeholder engagement through new and changing technologies. This includes customer and stakeholder expected support for smartphones, voice activated home assistants, 5g networks, web browsers and next generation technologies which gain prevalence in the coming 7 years



## "Customer and Market Systems" Planned Investments

Customers, Community Groups, Electrical Partners and Retailers

- Agility, enabling Energy Queensland to be more responsive to changing interaction demands and expectations, including subscription services for "push" type communications

### Other Minor Application Upgrades and Updates

**Overview** In addition to the above "Consolidation and Replacement" initiatives, a set of minor upgrades and updates are forecast to maintain Energex and Ergon Energy's Customer and Market Systems applications and tools for continued serviceability.

These include updates to the following software:

- iTron Enterprise Edition (IEE)

**Table 6: Roadmap Segment "Customer and Market Systems" Planned Initiatives**

## 5.4.2 Roadmap Segment 2: Asset and Works Management

Asset and Works Management systems include ICT applications, tools and data stores to support Energex and Ergon Energy's asset management, planning and works delivery functions as described in Table 7.

Category	Business Functions	Existing ICT systems	
		Energex	Ergon Energy
Enterprise Asset Management (EAM)	Network Asset Management		
	Network Asset Performance and Maintenance	ABB Ellipse Primavera	ABB Ellipse Artemis
	Works Portfolio, Program and Project Management		
	Spatial and Network Model Management	NFM Esri	GE Smallworld E Corp
	Asset Monitoring and Inspections	ABB AIS Fugro ROAMES CBRM	GT FMC IPS Cond Mon JAMIT Fugro ROAMES CBRM GE Fieldsmart
Network Planning and Design	Distribution Load Forecasting	NLF & SIFT	SIFT
	Network Planning	DINIS PSS-SINCAL NetPlan	PSS-SINCAL DFD
	Network and Substation Design	Worksplan Microstation ProjectWise CBMD	GE Smallworld Microstation Stride, Catan eDMS (Filenet)
Distributed Workforce Automation	Work Packaging, Schedule and Despatch (including Mobile)	ABB Svc Suite Microscheduler	ABB Svc Suite Microscheduler
	Work Execution		

**Table 7: Roadmap Segment "Asset and Works Management" Business Functions**

Prior to the coming regulatory control period, the following key works are underway or planned:

- **Unified EAM** – Energex and Ergon Energy are progressively deploying consistent “unified” systems and business processes spanning Asset Management, Maintenance, Portfolio, Program and Project Management.

Together with the companion Unified ERP initiative, the new solution will replace Energex and Ergon Energy's legacy ABB Ellipse v5.2 systems and related software, ensuring the ongoing supportability, cybersecurity, compliance and operational safety.

The new solution and business processes also underpin the Energex and Ergon Energy performance improvements targeted to be achieved in the coming regulatory period.

Planned initiatives in the coming regulatory period are itemised in Table 8 (over page).

**GIS Consolidation and Replacement** (Business Case Ref: ID01)

**Overview** In both Energex and Ergon Energy, the Geographic Information System (GIS) is a key element of the asset management process. Between the EAM solution (EAM) and the GIS, the core data for each asset within the physical and electrical network models are mastered, while supporting the major asset lifecycle processes of asset design, build and commissioning.

Energex’s GIS solution is primarily based on a custom-built Network Facilities Management (NFM) system, supplemented with Esri spatial tools. NFM was developed and deployed in the 1990s and is highly customised for Energex’s historical operating practices. It is not adaptable to business change and it relies on in-house skills and capability which are not sustainable in the medium to long term.

Ergon Energy uses the General Electric (GE) Smallworld GIS product together with Esri tools for spatial network modelling, visualisation and analytics. Smallworld was deployed into Ergon Energy in 2003 with a subsequent update to the “Version 4 Electric Office” product. GE has now shifted its development focus to the newer “Version 5” Smallworld product, which represents a significant change for this mission critical business system.

The GIS is the source-of-truth for the companies’ “as built” electricity network models. The GIS solutions and business processes must therefore be robust and resilient to change, in order to ensure the accuracy of this network information which underpins the companies’ safe operation and control of the networks through the Distribution Management System (DMS).

Continued parallel operation of two ageing GIS solutions through the coming regulatory control period represents a material risk to Energex and Ergon Energy’s ability to maintain service delivery performance levels as the network becomes more complex.

In the coming regulatory period, it is planned to replace these key systems for ongoing sustainability. The replacement will also be leveraged to roll out consistent, best practice work processes for productivity improvement and network capital efficiency.

**Benefits Enabled** **Productivity and Efficiency Benefits**

Network data management productivity improvement through:

- simplified workflows;
- focus on accurate data capture at source, with reduced need for rework; and
- reduced network model duplication and synchronisation.

Network asset management improvement through:

- improved GIS spatial network model management solution capability;
- improved ability to overlay non-network information for analysis efficiency;
- state-wide aggregation of asset management workload; and
- continuous improvement in asset management processes with full rollout of ISO55000 practices and with state-wide insights and network intelligence.

**Non-Financial Benefits**

ICT Asset Management:

- Sustainment of the companies’ GIS spatial network model management capability for ongoing supportability, cybersecurity and operational safety

Safety, Security & Risk

- Continuous improvement in safety risk mitigation through accurate network data and consistent state-wide work practices enabling safe staff interoperability between Energex and Ergon Energy regions
- Ensures appropriate security controls are maintained regarding access to information related to critical infrastructure and privacy of customer data

Customer & Stakeholder

- Meets the community’s “open data” expectations for access to accurate and timely spatial

and non-spatial data regarding the companies’ assets

**Agility**

- Agility in responding to ongoing regulatory, compliance and technology changes, building upon the companies’ information intelligence architecture

**Design Tools Consolidation and Replacement** (Business Case Ref: ID05)

**Overview** Energex and Ergon Energy use various processes, systems and tools for network and telecommunications design activities.

This investment primarily responds to the need to ensure sustainable, supportable and efficient design systems and processes, and to effectively and securely manage design drawings across the regions. The systems and tools in scope for replacement and consolidation will be between 17 and 25 years of age at the time of replacement.

Energex’s Workspan system was built in the 1990s and is highly customised. Engineering calculations and business rules are built into the application, providing a toolset for paraprofessionals to produce standard distribution lines designs.

Ergon Energy uses a combination of Catan and the Smallworld Electric Office Design Tool for distribution lines design. Catan is an integrated package that holds the business rules and calculations similar to Workspan. Engineering results from Catan are entered into Smallworld Electric Office to finalise the design.

Smallworld was first deployed into Ergon Energy in 2003 with a highly customised network design solution known as Common Layout Design (CLD). This has since been updated to the Smallworld Electric Office Design Tool, but the existing business processes and tool usage retain various inefficiencies.

The Communications Bearer Master Database (CBMD) and Stride are communications design tools. Continued operation of Energex’s ageing CBMD carries several significant risks and the application is also limited through its lack of telecommunications planning capability. Ergon Energy’s Stride also has various limitations and will be 20 years old as at the proposed time of replacement.

The Electronic Drawing Management System (eDMS) is Ergon Energy’s drawing repository based on FileNet, a product acquired by IBM in 2006. The eDMS was implemented in 1999 with the underpinning FileNet product moving to end-of-life in April 2011.

**Benefits Enabled** **Productivity and Efficiency Benefits**

**Design productivity**

- Process improvement through reduced manual actions
- Aggregation of lines design and communications design workload for optimal workforce productivity
- Design delivery improvement through consistency of calculations and common lines design building blocks

**Communications network management effectiveness**

- Ad-hoc, labour intensive planning is minimised through a communications design toolset that has appropriate planning capabilities
- Productivity improvement through communications tool integration with the Unified GIS

**Non-Financial Benefits**

**ICT Asset Management**

- Sustainment of the companies’ design tools, communications management tools and drawing management systems for ongoing supportability, cybersecurity and operational safety

Safety, Security & Risk

- Continuous improvement in safety risk mitigation through consistent processes, consistent field staff training, and a single drawing management system across the different regions

Supplier Interaction

- Improved relationships with external design engineering services through the provision of seamless, efficient interactions with contemporary design tools and interfaces

Compliance

- Continue to meet AER asset reporting requirements
- Meet all other regulatory requirements including the Queensland Government Building Information Modelling requirements

**Distribution Forecasting Tools Consolidation and Replacement** (Business Case Ref: ID06)

**Overview** Energex and Ergon Energy conduct distribution forecasting and network planning activities in accordance with the National Electricity Rules (NER).

Currently, Energex and Ergon Energy develop demand forecasts down to distribution feeder level (Energex) and to zone substations (Ergon Energy) based on historical demand and weather data. Traditionally, customer energy usage patterns were relatively stable and electricity was mainly supplied from large power plants. Established forecasting models and assumptions therefore provided the required forecast accuracy.

This is no longer the case as energy usage behaviours have significantly changed in recent years. In today's environment, the customer chooses how to generate and use electricity resulting in growing complexity of Energex and Ergon Energy's forecasting tasks.

Both companies have limitations in capability to determine demand and energy requirements at the Low Voltage (LV) level of the network. This results in a lack of detailed forecasting and planning for the LV networks and a consequential lack of information regarding how the LV networks are being used by customers. The growing penetration of Distributed Energy Resources (DER), particularly including solar photo voltaic (PV) generation and the focus on demand tariffs have highlighted a need to better understand the load requirements of the LV networks.

This investment primarily responds to the need for a sustainable and fit-for-purpose ICT solution to support Energex and Ergon Energy's distribution load forecasting processes. At the time of the planned investment, the existing legacy forecasting tools will be between 13 and 17 years of age. In the case of the key legacy Substation Investment Forecasting Tool (SIFT), there are limited available skills to continue maintaining the in-house developed platform.

The current situation therefore represents a supportability and business continuity risk in relation to Energex and Ergon Energy's forecasting function and to the companies' compliance with regulatory reporting obligations. The reporting requirements include the obligations to deliver Distribution Annual Planning Reports (DAPRs), annual and five yearly Regulatory Information Notice (RIN) reporting and demand forecast reporting to Powerlink, the Queensland Transmission Network Service Provider (TNSP).

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Distribution Forecasting Productivity

- Distribution forecasting process improvement through reduced manual actions
- Aggregation of distribution forecasting workload for optimal workforce productivity
- Distribution forecasting delivery improvement through consistency of scenario modelling and common calculations and assumptions

Capital Works Program Optimisation

- Enhanced trend and scenario modelling capabilities provide a more granular understanding of future demand, driving improved network capital investment decision-making



## “Asset and Works Management” Planned Investments

- Network investment plans can be tailored to the local requirements of particular network segments (small area modelling capabilities)
- Opportunity to reduce or defer capital investment through better analysis of customer energy usage and targeting of demand management programs
- Opportunity to deploy non-network alternative solutions, through a more granular understanding of the low voltage network

### Non-Financial Benefits

#### ICT Asset Management

- Sustainment of the companies’ distribution forecasting tools for ongoing supportability, cybersecurity and operational safety

#### Safety, Security & Risk

- Improved scenario modelling and better decision-making ensures that distribution forecasts match the actual demand, thus mitigating security of supply risk

#### Customer & Stakeholder

- Identifying problem areas (technical and capacity) as they develop (e.g. electric vehicle hot spots) may result in fewer customer complaints due to more accurate forecasts in small area grids
- Improved customer connection processes and timeframes as a result of more accurate forecasting
- Improved interface with owners of large renewable plants

#### Compliance

- Compliance with regulatory reporting requirements e.g. DAPR, RIN
- Compliance with the NER, ensuring prudent and efficient investment in the distribution system
- Compliance with ISO55000 asset management practices

## Network Planning Tools Consolidation and Replacement (Business Case Ref: ID15)

**Overview** Energex and Ergon Energy’s existing modelling and analysis tools support distribution operations in the following areas:

- Network optimisation and configuration
- Network upgrades and augmentation planning
- Customer connection planning
- Contingency planning
- Fault investigations
- Protection scheme design, modification and upgrade

This investment primarily responds to the need for sustainable and fit-for-purpose ICT solutions to support Energex and Ergon Energy’s distribution network planning processes.

At the time of the planned replacement, the legacy planning tools will be between 15 and 23 years of age. The existing tools no longer support the growing need for sophisticated engineering analysis (e.g. summarising feeder constraints and performance at more granular network and customer levels, providing more information about the impact of PV systems and new technologies and alignment with RIN and DAPR requirements).

In the case of the key legacy NetPlan system and DFD, there are limited available skills to continue maintaining the in-house developed platforms.

The current situation therefore represents a supportability and business continuity risk in relation to Energex and Ergon Energy’s network planning functions and to the companies’ compliance with regulatory obligations.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Planning Productivity and Effectiveness

- Labour intensive set-up and validation of the DINIS and PSS-SINCAL models is reduced through integration of planning tools with the Unified GIS
- Productivity improvement through improved automation
- Improved accuracy in network investigations at the low voltage and small area network level, resulting in Energex and Ergon Energy’s ability to integrate new technologies, such as Microgrids
- Reduction in costs from 3rd party providers conducting network studies on behalf of Energex and Ergon Energy

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies’ network planning tools for ongoing supportability, cybersecurity and operational safety

Safety, Security & Risk

- Continuous improvement in safety risk mitigation through effective assessment of protection devices and network protection schemes and accurate assessment of network constraints
- Reduced operational risks through improved fault analysis, reliability studies and contingency studies

Compliance

- Continue to meet AER asset reporting requirements and all other regulatory requirements related to network planning

**Asset Inspection & Monitoring Consolidation and Replacement (Business Case Ref: ID11)**

**Overview**

Asset inspections, monitoring tools and processes support the safe and reliable operation of the electricity network. Cyclic, time based inspections are key to mitigating asset failure and defect events. In addition, Energex and Ergon Energy have established condition-based maintenance capabilities aimed to optimise the preventative maintenance program.

Large-scale asset inspection programs (e.g. comprehensive substation inspections) are commonly performed by contracted external service providers, with Energex and Ergon Energy providing mobile handheld devices to perform these asset inspections.

In the case of pole and related asset inspections, Energex and Ergon Energy have a statutory obligation to maintain these assets in accordance with the Queensland mandate. While there are no specific compliance obligations for substation inspections, Energex and Ergon Energy have an obligation to ensure the safe operation of the electricity network. A cyclic asset inspection scheme ensures that potential issues are rectified and that failure and defect events are prevented where practically possible.

This investment primarily responds to the need to ensure sustainable, supportable asset inspection and monitoring processes.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Asset Inspections and Monitoring Productivity

- Improved judgements on asset replacements or repair through additional asset condition information capture and improved analysis, resulting in reduced asset failures
- Aggregation of asset inspections and condition monitoring workload for optimal workforce productivity
- Improved identification of trends related to network defects and maintenance issues, through improved asset condition information and analysis, resulting in a reduced corrective

maintenance

- Labour intensive usage of the CBRM and JAMIT tools is reduced through integration with the Unified ERP EAM.

### Non-Financial Benefits

#### ICT Asset Management

- Sustainment of the companies’ asset inspections and condition monitoring tools for ongoing supportability, cybersecurity and operational safety.

#### Safety & Risk

- Improved asset inspection and condition monitoring tools result in better analysis of the network, ensuring workforce and community safety.

#### Customer

- Supports the ‘Look up and live’ safety campaign

#### Compliance

- Compliance with the Queensland Electrical Safety Act 2002, the Queensland Electrical Safety Regulation 2013 (ESR) and the QLD Electrical Safety Code of Practice 2010 – Works (ESCOP-Works)

## Field Force Systems Consolidation and Replacement (Business Case Ref: ID03)

**Overview** Field Force Automation (FFA) solutions are fundamental enablers of Energex and Ergon Energy’s efficient operations as distributors in the National Electricity Market. These foundation systems provide the core capability for the schedule and despatch of both customer and network initiated service orders to facilitate field based execution of market Business to Business (B2B) transactions, outage rectification and program of work activities.

The ABB Service Suite product was implemented by Energex in 2008 to deliver productivity improvement in field-based operations and to support the growth in customer initiated work after the Full Retail Contestability (FRC) market opening in Queensland. In the current regulatory period, the Energex-based ABB Service Suite solution was extended into Ergon Energy. This allowed the Ergon Energy distribution and retail businesses to operate at arm’s length. This capability has been essential in supporting compliance with the National Energy Customer Framework (NECF) and Power of Choice energy market reforms.

These FFA systems are key to the productivity of the distribution back offices and field workforces, delivering customer and outage rectification service work, as well as short cycle maintenance and capital work (in conjunction with the in-house developed Microscheduler application). The solutions have enabled the centralisation and rationalisation of despatch functions within each organisation and a range of process automation and optimisation.

By the end of the coming regulatory period, the Service Suite solution will have been in operation for 19 years. Given the ageing technology and design of the current solution and its criticality to both network and market operations, a replacement solution is required in the coming period.

The opportunity associated with the replacement will also be leveraged to consolidate onto a single platform with consistent best practice work processes for efficiency and productivity improvement.

### Benefits Enabled

#### Productivity and Efficiency Benefits

##### Compliance Productivity Improvement

- Agility and synergy in responding to changes in market processes
- Provision of contemporary FFA capability enables productivity improvement through higher levels of work bundling, flexible resource allocation and work allocation methods

### Non-Financial Benefits

#### ICT Asset Management

- Sustainment of the companies' FFA capability for ongoing supportability, cybersecurity and operational safety

#### Technology Advances

- Flexibility in enabling service order scheduling and despatch through new and changing technologies. This includes support for new devices as existing form factors become unavailable or uneconomic

#### Customer

- Agility, enabling Energex and Ergon Energy to be more responsive to changing customer demands and expectations.

### Other Minor Application Upgrades and Updates

**Overview** In addition to the above "Consolidation and Replacement" initiatives, a set of minor upgrades and updates are forecast to maintain Energex and Ergon Energy's Asset and Works Management applications and tools for continued serviceability.

These include updates to the following software:

- AutoCAD
- CymCap
- LVDrop
- MathDAS
- MATLAB
- PowerFactory

**Table 8: Roadmap Segment "Asset and Works Management" Planned Initiatives**

### 5.4.3 Roadmap Segment 3: Distribution Network Operations

Distribution Network Operations systems include ICT applications, tools and data stores to support Energex and Ergon Energy's electricity network control and management functions as described in Table 9.

Category	Business Functions	Existing ICT systems	
		Energex	Ergon Energy
Distribution Operations	Network Management	GE PowerOn	ABB SCADA & Paper Pinboards
	Switching Management	GE PowerOn AMS	FeederStat
	Outage Management	GE PowerOn	FeederStat
	Load Management	GE LCS	ABB LCS
	Network Operations Reporting	ABB FocalPoint	Various
	SCADA Network Configuration Management	SCADABase	SSDB
	Protection Configuration Management	IPS	IPS
	Network Monitoring Head End	EDMI MultiDrive	EDMI MultiDrive

**Table 9: Roadmap Segment "Distribution Network Operations" Business Functions**

Prior to the coming regulatory control period, the following key works are underway or planned:

- **GE PowerOn Version Upgrade** - Energex is currently upgrading from GE PowerOn Fusion to the current vendor-supported version, GE PowerOn Advantage.
- **Unified DMS (Network Management)** - The Energex PowerOn Advantage platform will serve as the basis for deployment of consistent Network Management capability across the Ergon Energy regions replacing manual processes, including the current use of printed control room "pinboards".

This common Energex / Ergon Energy deployment will be known as the "Unified DMS" (UDMS). The rollout of PowerOn Network Management and HV Switching Management will be phased across the Ergon Energy regions and will complete early in the coming regulatory control period.

The Unified DMS Network Management capability will enable the interoperability of Energex and Ergon Energy operational control centres in Brisbane, Townsville and Rockhampton, including support for operational fail-over for effective business continuity management in storm and emergency events.

Planned initiatives in the coming regulatory period are itemised in Table 10 (over page).

**Network Operations Systems Consolidation and Replacement** (Business Case Ref: ID02)

**Overview** Safe control and operation of the electricity network are Energex and Ergon Energy's primary responsibilities. Increasing network complexity necessitates that Energex and Ergon Energy maintain contemporary network operational control and management capability to ensure energy security for the Queensland community.

Energex has a well established Distribution Management System (DMS) for monitoring, control, switching and outage management of the High Voltage (HV) network based on the General Electric (GE) PowerOn product. The companion PowerOn Mobile product is used for the despatch and actioning of switching operations in the field. The PowerOn system will soon be extended to support network management across the Ergon Energy regions.

Following deployment of the Unified DMS Network Management capability, there will still remain several legacy Network Operations systems requiring consolidation and replacement in the coming regulatory control period.

This investment will ensure the long term sustainability, supportability and security of the companies' Network Operations systems and processes. This includes:

- Ergon Energy's outage management capability will transition from the FeederStat system to the Unified DMS Outage Management System (OMS).
- Energex and Ergon Energy's LV switching management support will transition from AMS (Energex) and FeederStat (Ergon Energy) to a replacement "Unified LV Switching Management System".
- Energex and Ergon Energy's SCADA network configuration capability will transition from the SCADABase and SSDB systems to a replacement "Unified SCADA Configuration Management System". Both SCADABase and SSDB will then be decommissioned.
- Energex and Ergon Energy's protection configuration capability will transition from the independent IPS Protection Management systems to a "Unified Protection Management System".
- The companies' load control systems will be replaced and consolidated.
- The companies' distribution network metering "head end" system will also be replaced or renewed for sustainability.

Together with the consolidation and replacement of the above capabilities, Energy Queensland will leverage the opportunity to standardise onto Common Operating Procedures (COP) across the state for improved productivity and operational service performance.

**Benefits Enabled** **Productivity and Efficiency Benefits**

Custom Application Support

- Reduced costs associated with support of highly aged custom built applications requiring specialist skills

Operational Performance

- Consolidation of Energex and Ergon Energy network control and operational work practices, reducing duplication and enabling improved productivity and performance

**Non-Financial Benefits**

ICT Asset Management

- Sustainment and security of the companies' critical network control and operation systems

Safety, Security & Risk

- Mitigation of safety risks during emergency event response, through consistency of control systems and work practices
- Mitigation of security and safety risks through accurate and consistent recording and management of SCADA and protection configuration recording and management

Customer & Stakeholder

- Improved network control and operations resilience and continuity through full operational



## "Distribution Network Operations" Planned Investments

- control centre fail-over capability between Energex and Ergon Energy regions
- Meets customer expectations for accurate assessment of outage impacts and efficient outage resolution

### Other Minor Application Upgrades and Updates

**Overview** In addition to the above "Consolidation and Replacement" initiatives, a set of minor upgrades and updates are forecast to maintain Energex and Ergon Energy's Distribution Network Operations applications and tools for continued serviceability.

These include updates to the following software:

- Chernalert chemical facts database
- Lightning tracker
- Radio Operational Support System (ROSS)
- GE PowerOn

**Table 10: Roadmap Segment "Distribution Network Operations" Planned Initiatives**

#### 5.4.4 Roadmap Segment 4: Corporate Systems

Corporate systems include ICT applications, tools and data stores to support Energex and Ergon Energy's enterprise business functions as described in Table 11.

Category	Business Functions	Existing ICT systems	
		Energex	Ergon Energy
Enterprise Resource Planning (ERP)	Financial Management		
	Accounting		
	Accounts Payable and Accounts Receivable (AR and AP)	ABB Ellipse	ABB Ellipse
	Procurement Management		
	Human Resources Management (HR)		
	Payroll		
	Environment, Health and Safety Management (EHS)	SAI Cintellate	SAI Cintellate
Business and Spatial Intelligence	Information Management	Unified Enterprise Intelligence Platform (SAP HANA)	
	Reporting and Analytics	and various legacy data warehouses, reporting tools and dashboards	
Content Management	Document Management	OpenText eDocs	HP Records Manager
	Records Management	(Hummingbird)	
	Unstructured Content Management	Internet Websites and various tools and repositories	

**Table 11: Roadmap Segment "Corporate Systems" Business Functions**

Prior to the coming regulatory control period, the following key works are underway or planned:

- **Unified ERP** – Energex and Ergon Energy are progressively deploying consistent “unified” systems and business processes spanning Finance, Accounting, AR, AP, Procurement, HR, Payroll and EHS.

Together with the companion Unified EAM initiative, the new solution will replace Energex and Ergon Energy's legacy ABB Ellipse v5.2 systems and related software, ensuring the ongoing supportability, cybersecurity, compliance and operational safety.

The new solution and business processes also underpin the Energex and Ergon Energy performance improvements targeted to be achieved in the coming regulatory period.

Planned initiatives in the coming regulatory period are itemised in Table 12 (over page).

**Information Repositories Consolidation and Replacement** (Business Case Ref: ID08)

**Overview** The primary record of Energex and Ergon Energy’s information is the companies’ core systems, including the ERP EAM, Geographic Information Systems (GIS), Customer Market Systems and others. For efficient access to information for reporting, analysis and operational performance management, these core systems are supplemented by a number of legacy information repositories (including data warehouses and similar environments), together with a collection of data discovery, visualisation, analytics and integration tools.

Like most companies of equivalent scale, Energex and Ergon Energy each operate a variety of such information repositories and tooling. As with all complex ICT solutions, these require cyclic maintenance, upgrade and replacement for ongoing supportability, cybersecurity, compliance and operational safety.

In the current regulatory period, Energex and Ergon Energy have established a foundational Enterprise Intelligence Platform based on modern, scalable and efficient SAP HANA technologies. This platform serves as the target platform for consolidation of legacy information repositories and tooling.

As noted above, Energex and Ergon Energy are currently transitioning to a Unified ERP EAM solution, which will migrate the companies’ existing Asset, Works, Finance, HR, Payroll and Procurement system functions. It will also transition the corresponding warehousing, reporting and analysis capability from the companies’ legacy information repositories and tooling across to the new Enterprise Intelligence Platform.

Following this transition however, substantial business information outside the scope of the Unified ERP EAM will remain in the legacy repositories. This residual information remains critical for business operations and for integration with other business systems.

Through this planned investment, the legacy information repositories and tooling will be consolidated into the Enterprise Intelligence Platform and dependent “satellite” systems will be reintegrated. The disparate Energex and Ergon Energy environments will be decommissioned.

**Benefits Enabled** **Productivity and Efficiency Benefits**

Reporting & Analysis

- Alignment and simplification of data collation and analysis across the Energex and Ergon Energy regions.
- Simplification of RIN reporting and internal review / verification.

Asset Management

- Optimisation of asset maintenance through effective condition assessment and defect / failure mode analysis.

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies’ advanced analytics capability as data volumes increase, ensuring ongoing supportability, cybersecurity and operational safety.

Asset Management

- Network asset management process improvement, leveraging the capability of the Enterprise Intelligence Platform (including the high speed analysis and reporting capability of SAP HANA).
- Improved investment planning leveraging the opportunities associated with the overlay and analysis of third party information sets.

Safety, Security & Risk

- Continuous improvement in safety risk mitigation through efficient and effective root cause analysis.

## “Corporate Systems” Planned Investments

### Customer & Stakeholder

- Meet community “open data” expectations through provision of timely, accurate and secure information regarding Energex and Ergon Energy’s distribution service.

### Compliance

- Agility in responding to ongoing regulatory, compliance and technology changes, building upon the companies’ information intelligence architecture.

## Process Management Systems Consolidation and Replacement (Bus Case Ref: ID16)

**Overview** Energex and Ergon Energy maintain independent management tools and repositories for the design, storage, access and maintenance of business process information. These include Casewise Corporate Modeller for process management, Microsoft Visio for process design and Microsoft SharePoint to enable access to the process document repositories.

A fit-for-purpose process management system is essential for the effective baselining, communication and continuous improvement of work procedures, detailed work instructions and standards across the workforce. The current systems are ageing and require prudent investment to ensure ongoing supportability, cybersecurity, compliance and operational safety.

Further, to enable the productivity improvement targets of Energex and Ergon Energy, both companies are rolling out consistent work practices for efficient business operations across the Queensland regions.

This investment will therefore replace the current process management systems, consolidating onto a single unified platform for sustainability and productivity.

### Benefits Enabled

#### Productivity and Efficiency Benefits

#### Operations

- Improved operational efficiency resulting from easy access to common best practice processes.

#### Process Management

- Reduced effort associated with content administration through the consolidation of current independent process management systems.

#### Non-Financial Benefits

#### ICT Asset Management

- Sustain the companies’ process management capability for ongoing supportability, cybersecurity and operational safety.

#### Change Management

- Improved ability to model processes to assess change impact and improved monitoring and automation.

## Document Management Systems Consolidation and Replacement (Bus Case Ref: ID12)

**Overview** Energex and Ergon Energy currently operate independent legacy document and records management systems. This planned investment will consolidate and replace these ageing systems by building upon the Enterprise Content Management (ECM) foundation capability delivered in the current period with the Unified ERP EAM program.

### Benefits Enabled

#### Productivity and Efficiency Benefits

#### Organisational Productivity

- Improved shared services productivity through streamlined best practice processes in document and records management.
- Reduced search time to find and retrieve documents.

### **Non-Financial Benefits**

#### ICT Asset Management

- Sustainment of the companies' document management capability for ongoing supportability, cybersecurity and operational safety.

#### Compliance

- Ensures ongoing compliance with regulatory and legislative requirements, including as specified in the Public Records Act.

**Internet Websites Consolidation and Replacement** (Business Case Ref: ID18)

**Overview** The current Energex and Ergon Energy websites were implemented in 2011 and are hosted under a managed service arrangement. The websites are critical for customer engagement and communication across an array of distribution business functions.

Key capabilities and information provided through the websites include:

- Contact details for reporting network outages and fallen powerlines
- Information on planned and unplanned outages
- Customer portal access for managing connections and other requests such as Solar PV
- Electrical contractor and supplier portals access (including training material for contractors)
- Information on electrical safety and related educational material
- Information for managing energy consumption and accessing demand management incentive schemes
- General information about each of the distributors. e.g. Organisation structures, objectives, governance and company reporting

At the commencement of the planned investment, the Energex and Ergon Energy websites will have been in operation for over a decade. Given the rapid change of internet technologies and growing cybersecurity threats, the websites will need to be replaced or redeveloped before the end of the coming regulatory control period (2025).

This investment will therefore replace and consolidate the current Energex and Ergon Energy websites and associated assets. This will facilitate consistent communication, support the adoption of consistent business processes and enable the two distributors to mutually benefit from future developments of a single solution.

**Benefits Enabled**

**Productivity and Efficiency Benefits**

Customer Operations Productivity

- Increased ability to address customer enquiries and ongoing information needs via the web channel, thereby reducing the level of agent-based customer interactions
- Reduced effort associated with content administration through the consolidation of current independent website assets

**Non-Financial Benefits**

ICT Asset Management

- Sustainment of the companies’ internet websites for ongoing supportability, cybersecurity and operational safety

Technology Advances

- Flexibility in enabling customer and stakeholder engagement through new and changing technologies
- This includes customer and stakeholder expected support for smartphones, voice activated home assistants, 5g networks, web browsers and next generation technologies which gain prevalence in the coming 7 years

Customers, Community Groups, Electrical Partners and Retailers

- Customers are provided a better range of options to interact with Energy Queensland resulting in a more fulfilling customer interaction experience
- Increased solution agility which allows Energy Queensland to be more responsive to customer demands

**Other Minor Application Upgrades and Updates**

**Overview** In addition to the above “Consolidation and Replacement” initiatives, a set of minor upgrades and updates are forecast to maintain Energex and Ergon Energy’s Corporate System



## "Corporate Systems" Planned Investments

applications and tools for continued serviceability.

These include updates to the following software:

- Enterprise Intelligence Platform (SAP HANA)

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**Table 12: Roadmap Segment "Corporate Systems" Planned Initiatives**

### 5.4.5 Roadmap Segment 5: Cybersecurity, Productivity and ICT Support

This roadmap segment includes Cybersecurity, End User Productivity and ICT Management tools to support Energex and Ergon Energy's distribution business operations as described in Table 13.

Category	Business Functions	Existing ICT systems	
		Energex	Ergon Energy
Cybersecurity	Cybersecurity, privacy and information assurance	Energex and Ergon Energy do not publicly disclose active cybersecurity controls and practices	
Digital Desktop Transformation	ICT Service Management and Support	BMC Remedy Jira	
	ICT Governance, Strategy & Architecture	Enterprise Architect	
	ICT Operational Tools and Software	Microsoft Office, Exchange and Sharepoint and SQLServer	
		Oracle DBMS and integration Shareplex Citrix VMWare and others	

**Table 13: Roadmap Segment " Cybersecurity, Productivity and ICT Support " Business Functions**

Prior to the coming regulatory control period, the following key works are underway or planned:

- **Cybersecurity** – Periodic updates to maintain Energex and Ergon Energy's security posture.

Planned initiatives in the coming regulatory period are itemised in Table 14 (over page).

### Cybersecurity System Replacements (Business Case Ref: ID17)

**Overview** Cybersecurity is a growing threat for critical infrastructure providers, including Energex and Ergon Energy.

See section 4 for a discussion of Energex and Ergon Energy's focus on cybersecurity over the coming regulatory period, including the direction of AEMO in formation of the CSIWG and the likely implications for DNSPs.

This specific investment in Cybersecurity is premised on the need to continually maintain a cybersecurity posture consistent with industry practice and responsive to rapidly evolving threats. It will replace ageing tools and cybersecurity subscriptions. In addition, further strengthening is planned in cybersecurity governance, policies and processes to embed cybersecurity into the culture of Energex and Ergon Energy.

**Benefits Enabled** **Productivity and Efficiency Benefits**

- None planned

#### Non-Financial Benefits

##### Safety and Risk

- Continually improving cybersecurity systems and processes enable Energex and Ergon Energy to maintain an appropriate risk position amid growing threats

##### Compliance

- Sustainable compliance with Energex and Ergon Energy's security obligations, including as specified in the Critical Infrastructure Act and the Australian Privacy Act

##### Customer and Community

- Continued security of Queensland's electricity distribution grid for the benefit and safety of the Queensland community
- Continued privacy protections for sensitive customer and community data

##### Reputation

- Energex and Ergon Energy's reputation is maintained through secure and safe operations

### ICT Management Systems Replacement (Business Case Ref: ID13)

**Overview** ICT management systems are essential tools to support the effective operations of Energex and Ergon Energy ICT and business support functions.

These systems underpin the ability to respond to ICT service requests, proactively maintain operational business systems and supporting hardware, and identify, plan and execute appropriate ICT works programs.

Collectively, the ICT management systems support a wide range of services including:

- ICT helpdesk and user support
- ICT system maintenance and monitoring
- ICT system configuration and change management
- ICT project and program delivery
- ICT strategy and architecture

This investment will replace a collection of legacy ICT service management and architecture systems, leveraging the opportunity to integrate with the resource management, program management and asset configuration components of the Unified ERP EAM. This will drive more efficient ICT support and reduced duplication of current functions.

**Benefits Enabled** **Productivity and Efficiency Benefits**

Improved operational productivity resulting from a consolidated and contemporary ICT management toolset. Benefit is derived from improvements in:

## "ICT Security, Productivity and Support" Planned Investments

- ICT task management
- Fault and defect diagnostics
- Root cause analyses and enablement of ICT continuous improvement practices
- ICT system monitoring
- Reduction in effort associated with maintaining duplicate ICT asset configuration management
- ICT architecture accessibility, flexibility and design efficiency

### Non-Financial Benefits

#### Operational Effectiveness

- Improved availability of ICT services due to enhanced ability to monitor systems and diagnose defects

## Other Minor Application Upgrades and Updates

**Overview** In addition to the above "replacement" initiatives, a set of minor upgrades and updates are forecast to maintain Energex and Ergon Energy's Cybersecurity, Productivity and ICT Support systems and tools for continued serviceability.

These include updates to the following software:

- Citrix
- VMWare
- Database Management Systems (Oracle and MS SQLServer)
- Shareplex
- Integration Software (Oracle Fusion and related tooling)
- Microsoft Office, Exchange and Sharepoint (transitioning to Office 365)

**Table 14: Roadmap Segment "Cybersecurity, Productivity and ICT Support" Planned Initiatives**

### 5.4.6 Roadmap Segment 6: ICT Devices and Infrastructure

ICT Devices and Infrastructure include equipment managed under Energex and Ergon Energy's ICT Infrastructure Asset Lifecycle Management guidelines (see section 3 for further information).

Table 15 below summarises the key infrastructure classes under management.

Category	Infrastructure Components	Sub-Components
Devices and Infrastructure	End User Devices	Laptops
		Tablets, PDAs and Handhelds
		Printers
		Mobile Phones
	Windows Servers	Windows Servers
		Rack Mount - Edge Servers
		Blade
	Unix Servers	HP / SUN
	Tape Storage	Tape Storage Drives/Silos
	Disk Storage	Disk Storage Tier 1
		Disk Storage Tier 2
	Data Network Infrastructure	Core Devices
		Special Devices (RADIUS / ACS / Call Mgr etc)
		WAN - Site
		LAN – Edge Switching
		VOIP Phones
	Technology Software	Operating Systems
		Security Software or Appliances
		Externally facing technology software

**Table 15: Roadmap Segment " ICT Devices and Infrastructure" Business Functions**

The above ICT assets are managed and renewed on a progressive basis. Therefore, there are no specifically itemised initiatives for this roadmap segment.

### 5.4.7 Roadmap Segment 7: Minor Change and Compliance

A small annual allowance is included within the roadmap to accommodate minor ICT changes to support mandatory business change driven from safety initiatives, risk assessments, network growth to support new customers, electricity market changes and audit recommendations. The amounts forecast for Minor Change and Compliance are consistent with the current regulatory period.

## Appendix A: ICT-as-a-Service Investment Decision Framework

Energex and Ergon Energy ensure prudent ICT investment, including consideration on the most appropriate ICT solution provision option for each individual planned investment.

The ICT-as-a-Service Investment Decision Framework is depicted in Figure 5 below.

This framework supports Energex and Ergon Energy in making informed investment decisions on the most optimal service provision model for each ICT solution.

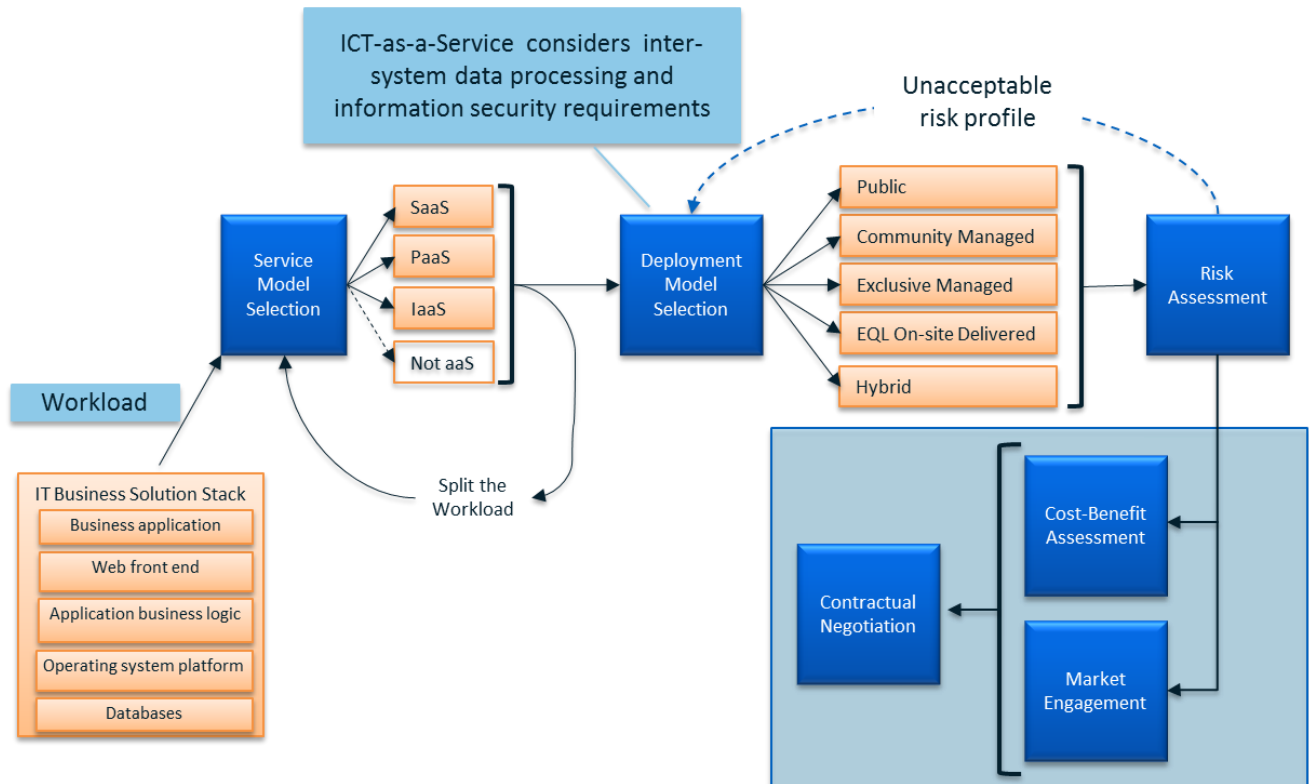


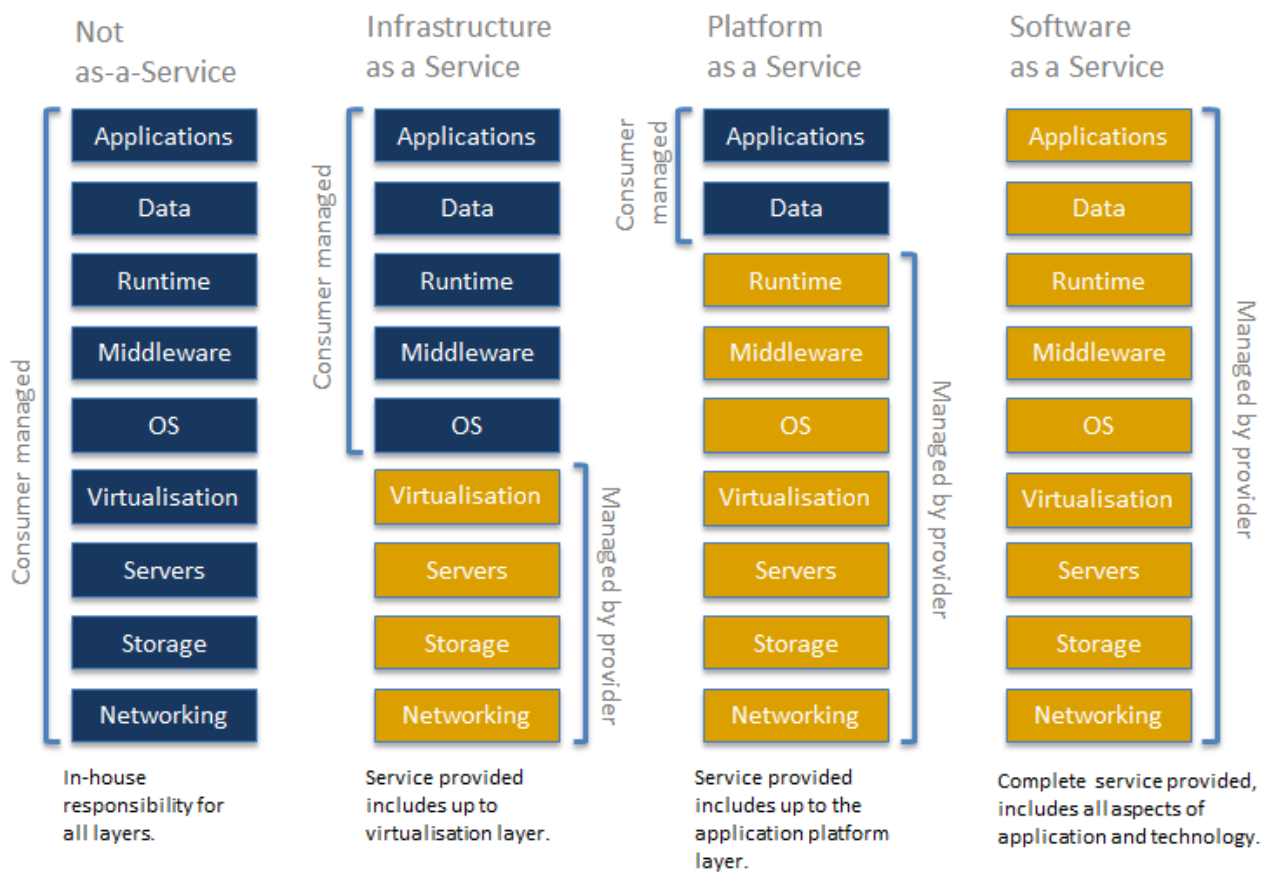
Figure 5: ICT-as-a-Service Investment Decision Framework Overview

The decision framework considers high-level commercial and policy viability assessment criteria including:

- Total cost of ownership of an ICT-as-a-Service solution;
- Costs of managing stranded assets (hardware and software licences) and possible staffing implications and costs; and
- Procurement, security, information privacy and data sovereignty policy requirements.

Various service provisioning models are considered within the decision framework as described in Figure 6 (over page).





**Figure 6: ICT-as-a-Service Models**

Deployment models are also factored into the overall assessment process. These define the environment and provider through which the various Service Models can be deployed.

Deployment models include:

- Energex / Ergon Energy internally hosted and managed;
- Exclusively hosted and managed in a private facility on behalf of Energex and/or Ergon Energy;
- Hosted and managed within a public shared facility on behalf of Energex and/or Ergon Energy; and
- Composite solutions comprising of the above.

The outcome of the assessment process is to provide the optimal ICT service delivery and deployment solution that provides an efficient, cost-effective, risk managed and scalable ICT implementation, taking a holistic approach to the evaluation each ICT investment.

## Appendix B: ICT Program Governance

The ICT Program is managed according to formal ICT investment governance, ICT portfolio management and project delivery lifecycle processes and methodologies. These processes and methods include phased stage gates, regular progress reporting, risk management and project dependency management.

The ICT Portfolio Management Framework is based on the Axelos Global Best Practice Model for Management of Portfolios (MoP). The framework defines portfolio management as “a coordinated collection of strategic processes and decisions that together enable the most effective balance of organisational change and business as usual.”

The ICT Investment Governance Process was developed in collaboration with PwC. It is a gated process that focuses on ensuring the robustness of investment proposals or business cases for ICT investments during the initiation phases. It also extends to the management of variations during the delivery of projects.

The ICT Project Delivery Lifecycle supports the Investment Governance Process. It aligns with the same stage gates while providing additional controls during the ‘execution’ phase. The lifecycle is summarised in Figure 7 (below).

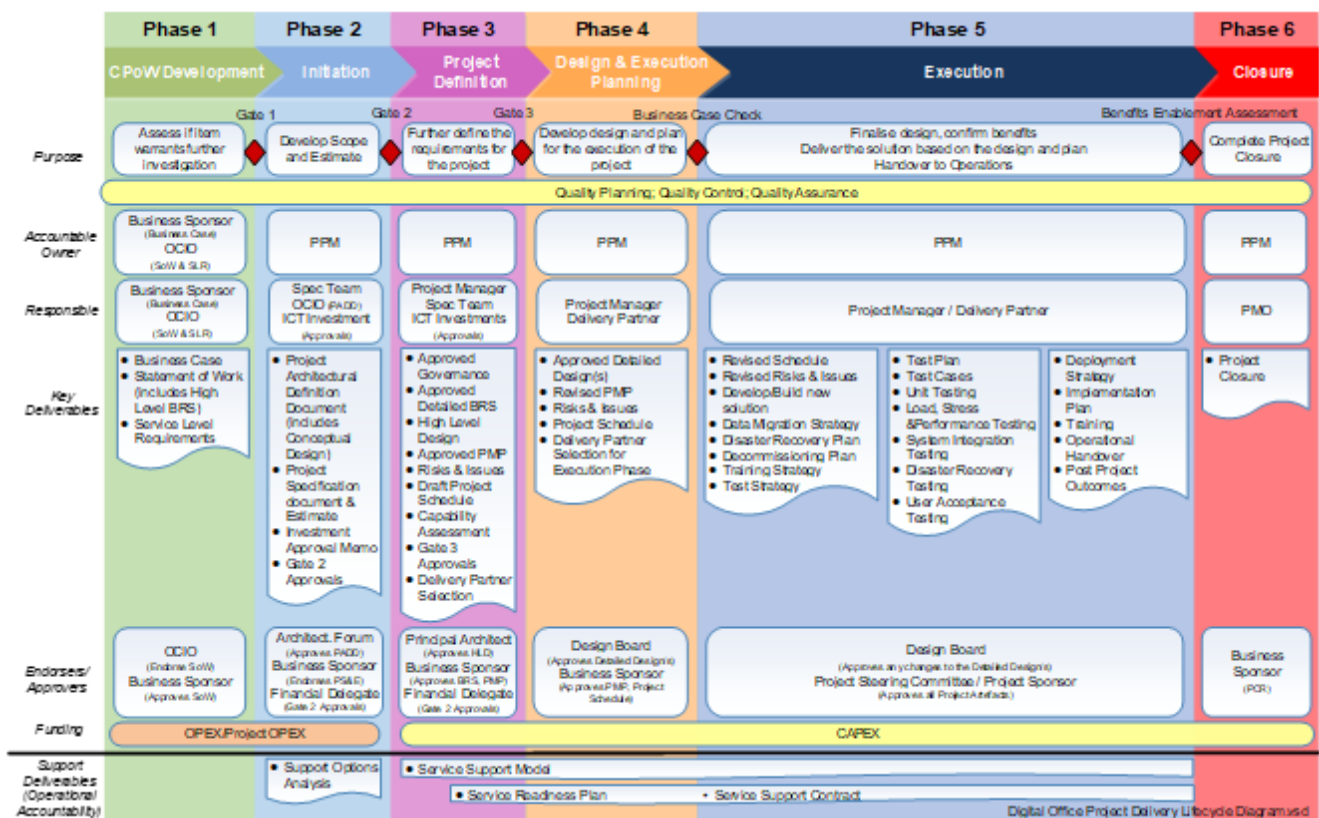


Figure 7: ICT Project Delivery Lifecycle

## Appendix C: ICT Infrastructure Replacement Guidelines

Table 16 below summarises Energex and Ergon Energy's ICT Asset Lifecycle Management guidelines for hardware, devices and other ICT infrastructure assets.

Category	Type	Replacement Cycle	Guideline	Forecast Replacement Age	Comment
End User Devices	Desktops	Replace on fail (Financial Obsolescence)	No maintenance after warranty (3 years). Replaced only on failure or at approved user request.	4 years	Device age not to exceed 6 years
	Laptops	Replace on fail (Financial Obsolescence)	No maintenance after warranty (3 years). Replaced only on failure or at approved user request.	3 years	Device age not to exceed 5 years
	Tablets / PDAs / Handhelds	Replace on fail (Financial Obsolescence)	No maintenance after warranty. Replaced only on failure or at user request.	2 years	Mobile Device Management capability is enabling the replacement of Handhelds and PDAs with Tablets
	Printers	Replace on fail	Energex: Xerox Managed Service Ergon Energy: Xerox Managed service	4 years	
	Mobile Phones	End of lease	Replaced only on failure or at approved user request.	2 years	
Server Infrastructure	Windows Servers Rack Mount - Edge Servers	5 years (Technical Obsolescence)	Virtualise at end of warranty where viable. Review prudence each year after warranty to consolidate or extend maintenance for 12 months.	5 years	Virtualise first. Achieve HW independence from systems to facilitate effective asset management independent of application lifecycle.
	Blade	5 years (Technical Obsolescence)	Virtualise at end of warranty where viable. Review prudence each year after warranty to consolidate or extend maintenance for 12 months.	5 years	
	Unix Servers HP / SUN	5 years (Technical Obsolescence)	Review each year after warranty to consolidate or extend maintenance for 12 months. Maximum age 5 years.	5 years	Updating procurement to increase warranty period to 5 years where available

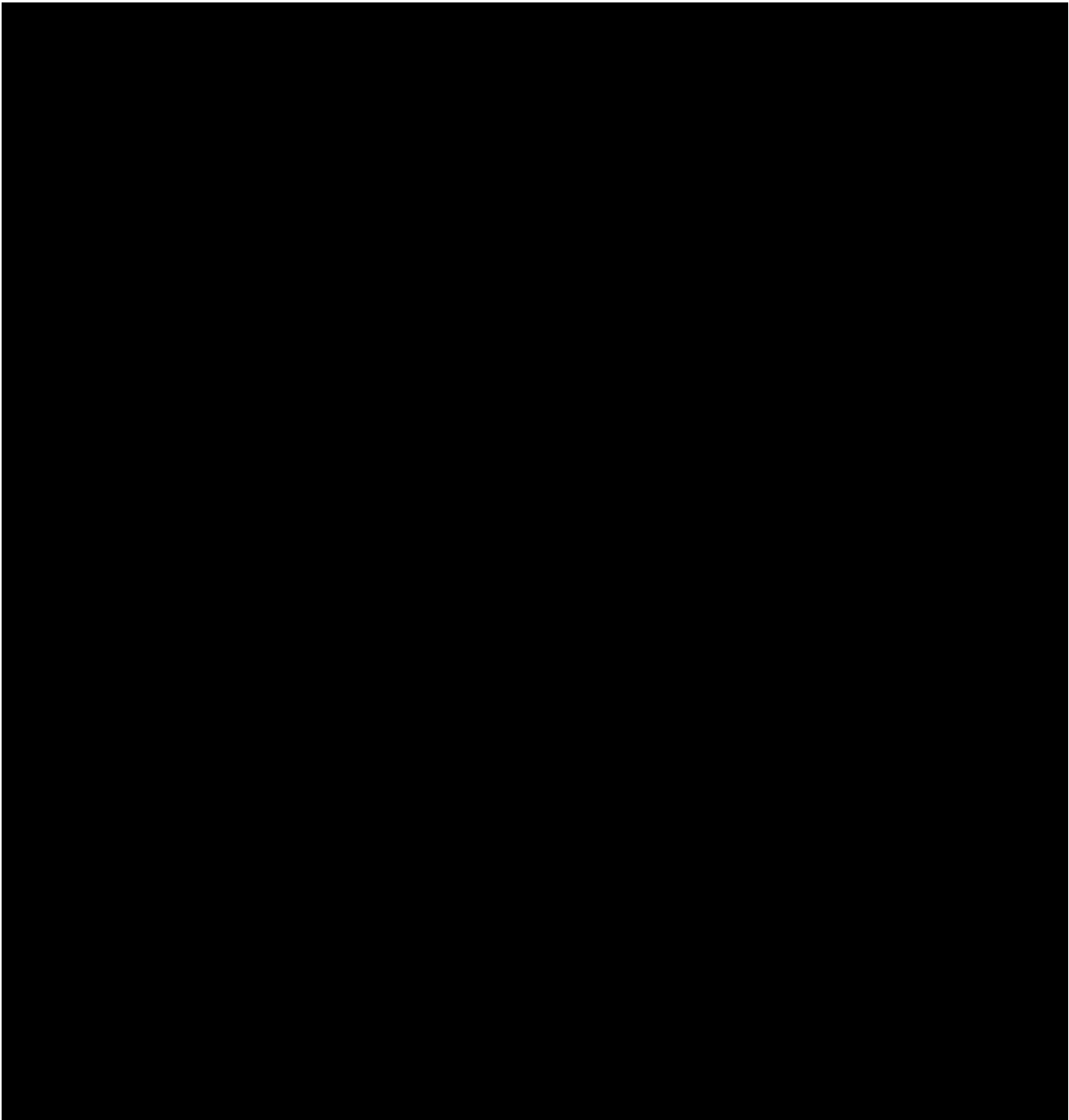
Category	Type	Replacement Cycle	Guideline	Forecast Replacement Age	Comment
Storage Infrastructure	Tape Storage Drives/Silos	5 years (Technical Obsolescence)	Review each year after warranty. Not to exceed 5 years	5 years	Tape storage should only be used for off-site storage requirements.
	Disk Storage Tier 1	3 years (Financial Obsolescence)	Managed replacement on expiry of warranty bundled with capacity expansion requirements.	3 years	Recent replacements have shown that maintenance costs past warranty are not cost effective when bundled with significant capacity expansions in comparison to higher density new technologies.
	Disk Storage Tier 2	3 years (Financial Obsolescence)	Managed replacement on expiry of warranty bundled with capacity expansion requirements.	3 years	Recent replacements have shown that maintenance costs past warranty are not cost effective when bundled with significant capacity expansions in comparison to higher density new technologies.
Data Network Infrastructure	Core Devices	Vendor EOL (Asset Obsolescence)	Sustain Vendor Support. Always on maintenance. Reviewed annually after 3 years. Not to exceed 5 years	4 years	
	Special Devices (RADIUS / ACS / Call Mgr etc)	Vendor EOL (Asset Obsolescence)	Sustain Vendor Support. Always on maintenance. Reviewed annually based on Vendor End of Life announcements	5 years	Depending of purchased dates within product sale cycle, EOL is generally between 4-6 years.
	WAN - Site	Vendor EOL (Asset Obsolescence)	Sustain Vendor Support. No Maintenance past warranty. Hold Spares. Reviewed annually based on Vendor End of Life announcements.	5 years	Depending of purchased dates within product sale cycle, EOL is generally between 4-6 years.
	LAN – Edge Switching	Vendor EOL (Asset Obsolescence)	Sustain Vendor Support. Chassis Based: Always on Maintenance Non-Chassis: No Maintenance past warranty. Hold Spares. Reviewed annually based on Vendor End of Life announcements.	5 years	Depending of purchased dates within product sale cycle, EOL is generally between 4-6 years.

Category	Type	Replacement Cycle	Guideline	Forecast Replacement Age	Comment
	VOIP Phones	Vendor EOL (Asset Obsolescence)	Sustain Vendor Support. No Maintenance past warranty. Hold Spares. Reviewed annually based on Vendor End of Life announcements.	5 years	Relatively new assets. Age behaviour / reliability not yet proven
Technology Software	Operating Systems	Vendor End of Support for security patches (Asset Obsolescence)	Operating Systems must to be maintained at a version where security patches are actively being developed. While the terminology between vendors varies such as Extended Maintenance or End of Support, the driving factor is the availability and release of security patches.	Win2K3 – 2015 Win2K8 – 2020 Win7 – 2020 HPUX11V2 – 2015 HPUX11V3 – 2020	Most applications are dependent on specific operating system versions. Application upgrades are likely to be required to support Operating System version changes.
	Security Software or Appliances	Vendor End of Support for security patches (Asset Obsolescence)	Software Technologies or appliances that perform security related roles such as firewalls, proxies, authentication and authorisation must to be maintained at a version where security patches are actively being developed. While the terminology between vendors varies such as Extended Maintenance or End of Support, the driving factor is the availability and release of security patches.	5 years	
	Externally facing technology software	Vendor End of Support for security patches (Asset Obsolescence)	Software Technologies or appliances that host externally facing (internet) solutions must be maintained at a version where security patches are actively being developed. While the terminology between vendors varies such as Extended Maintenance or End of Support, the driving factor is the availability and release of security patches.	5 years	

**Table 16: ICT Infrastructure Asset Lifecycle Management Guideline**

**Appendix D: ICT Capital Expenditure Breakdown**

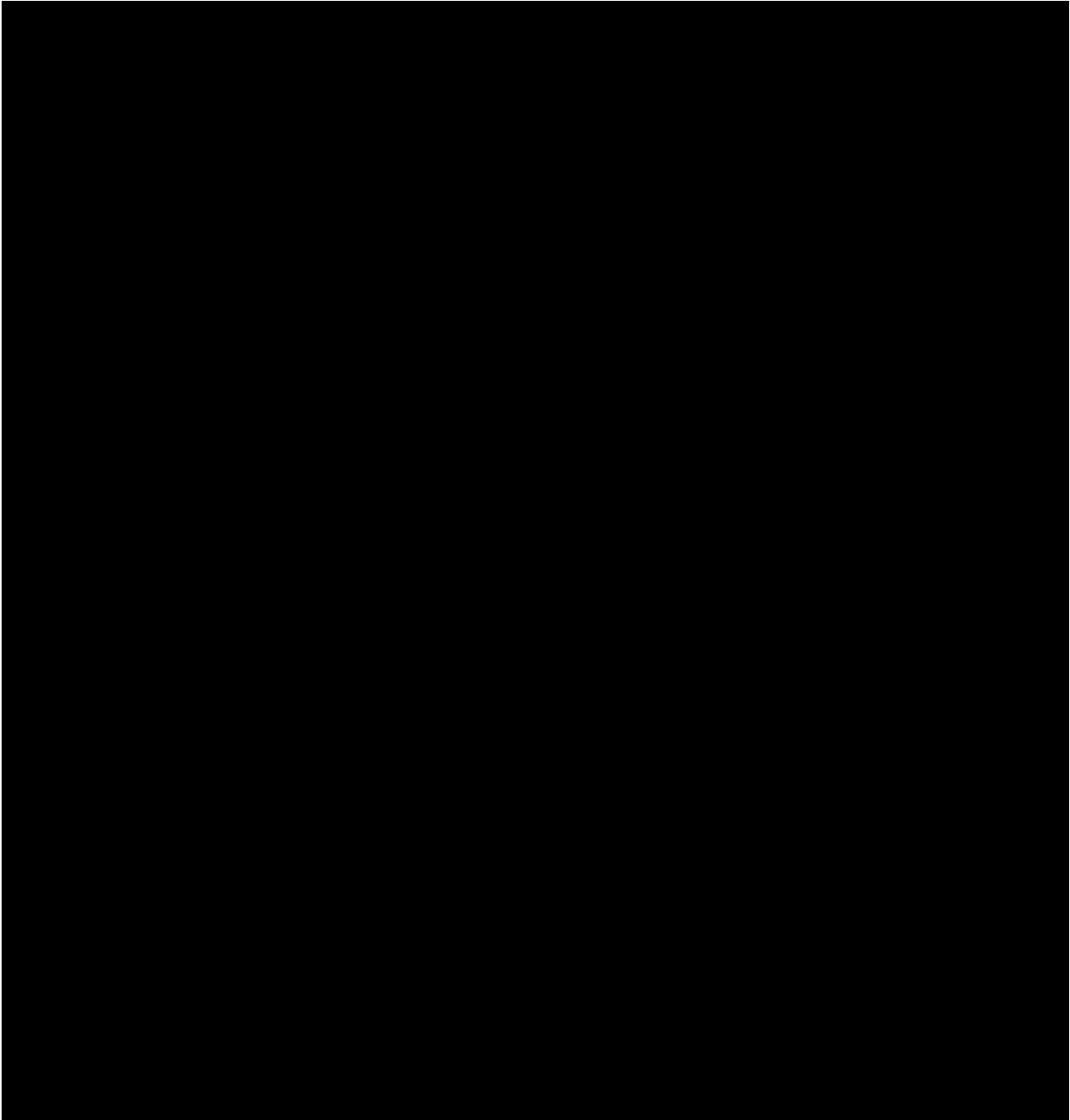
Table 17 (below) summarises Energex ICT Capital Expenditure (SCS+ACS 2020 Real).



**Table 17: ICT Program Expenditure Breakdown (Energex)**



Table 18 (below) summarises Ergon Energy ICT Capital Expenditure (SCS+ACS 2020 Real).



**Table 18: ICT Program Expenditure Breakdown (Ergon Energy)**

## Appendix E: Glossary

This section describes key terms and acronyms used in this document.

Term	Definition
ACS	Alternative Control Services
ACSC	The Australian Cyber Security Centre
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASD	Australian Signals Directorate
B2B	Business to Business
Capex	Capital Expenditure
CATS	Consumer Administration and Transfer System
CCT	Contact Centre Technologies
CMS	Customer Management System
COP	Common Operating Procedures
CSIWG	Cyber Security Industry Working Group
C2M2	Cybersecurity Capability Maturity Model
DAPR	Distribution Annual Planning Report
DER	Distributed Energy Resources
DMS	Distribution Management System. An electricity distribution network management system used for operational monitoring and control of the grid
DNSP	Distribution Network Service Provider (e.g. the Energex and Ergon Energy distribution businesses)
EAM	Enterprise Asset Management system, comprising functions including Network Asset Management, Network Asset Performance & Maintenance, Works Portfolio and Project Management.
ENA	Energy Networks Australia
ERP	Enterprise Resource Planning system, comprising functions including HR Management, Payroll, Finance, AR, AP and Procurement.
ESCOP	The Queensland Electrical Safety Code of Practice
FACOM	The legacy mainframe customer management and operations system decommissioned during the current regulatory period.
FFA	Field Force Automation
GIS	The Energy Queensland Geographic Information and Network Model Management Systems
GSL	Guaranteed Service Levels

Term	Definition
HR	Human Resources
HV	High Voltage
IaaS	Infrastructure as a Service. Commercially provided hosting of physical and virtual server capacity.
ICT	Information Communication Technology
IVR	Interactive Voice Response
LCS	Load Control System
LV	Low Voltage
MDM	Meter Data Management
NECF	National Energy Customer Framework
NEM	National Electricity Market
NER	National Electricity Rules
NFM	Network Facilities Management system
NPV	Net Present Value
OCC	Operational Control Centre
OMS	Outage Management System
Opex	Operating Expenditure
PaaS	Platform as a Service. Commercially provided hosting of operating platforms including hosted operating systems, databases, storage and other platforms.
PACE	The applications classification model defined by industry research body Gartner.
PC	Personal Computer
PoC	Power of Choice
PV	Photo Voltaic
RIN	Regulatory Information Notice
SaaS	Software as a Service. Commercially hosted software solutions.
SCADA	Supervisory Control And Data Acquisition
SCS	Standard Control Services
SI Portal	Service Interaction Portal
SIFT	Substation Investment Forecasting Tool
SMS	Special Messaging Service “Text” messaging
SPARQ	SPARQ Solutions Pty Ltd. Energex and Ergon Energy’s previous ICT service delivery joint venture.
TNSP	Transmission Network Service Provider

Term	Definition
UDMS	Unified DMS (the joint Energex and Ergon Energy deployment of GE PowerOn Advantage)
WACC	Weighted Average Cost of Capital
WH&S	Workplace Health & Safety