ICT Strategy

prepared for the 2024-29 regulatory period

PowerWater

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Executive Summary

Power and Water, like many electricity utilities in Australia and throughout the world, needs to ensure that its operating model and systems can respond to the introduction of new technologies that have the potential to disrupt existing markets and services. Renewable energy, battery storage, electric vehicles and enhanced energy efficiency are just a few of the factors impacting energy usage throughout the Northern Territory. ICT systems and assets are vital for assisting with the integration of renewable and distributed energy resources, improving Power and Water's communications with our customers, and enabling improved business performance.

This Information and Communications Technology (ICT) Strategy describes Power and Water's strategic challenges, themes, current performance, strategies and high-level plans through to June 2029.

Power and Water's ICT strategy and strategic objective is described as:

ICT is a trusted business partner, responding to business-driven requirements, and enabling business results and change.

Our strategic objective will be achieved by implementing the following strategies:

1. Establish contemporary, fit-for-purpose digital capabilities driven by the business' requirements
2. Achieve a sufficiently robust level of cyber security
3. Build the ICT resource capability.

Our ICT Strategy is guided by the following themes, challenges, and opportunities:

- Responding to the need for greater ICT functionality and capacity to support the business to manage the increasingly complex operating environment efficiently and effectively
- Reducing the technology debt that has built up in core systems that are now either at or near end-of-life and/or do not provide the required functionality
- Leverage the opportunities for IT and Operational Technology (OT) convergence where it makes business sense
- Build ICT resource capability in a scarce skills market
- Managing the cost of ICT through efficient work practices, sustainable systems, and use of commercial services
- Manage the transition to off-premise/cloud hosted services from on-premise hardware and applications without business disruption and loss of cost control
- Improving communication with our customers and other stakeholders
- Improving our asset management and network planning capabilities
- Leverage off the experiences of other NSPs
- Mitigating cybersecurity threats through proactive management and appropriate controls
- Leveraging data for business efficiency, risk mitigation and effective network asset utilisation.
- Assisting our full transition to National Electricity Rules (NER) compliance in a prudent and efficient manner

Power and Water has developed an ICT expenditure plan to meet the ongoing operational and regulatory requirements of the regulated network business. Power and Water is proposing $64 million ($2022) for ICT

for the next regulatory period, an increase compared to $46 million ($2022) expected to be spent in the current regulatory control period.[1]

The majority of the non-recurrent capex is due to three major projects which collectively represent 76% of the ICT capex forecast (noting that each also incur capex in the current regulatory period):

- Capability Uplift project (Operating model).
- OT capability uplift project.
- Cyber security enhancement project.

[1] Rounding to whole numbers in Figure 1 lead to lower aggregates

1 Purpose and Scope

The purpose of this document is to outline Power and Water's strategic approach for ICT projects and expenditure relating to the regulated business activities for the period from 1 July 2024 to 30 June 2029. This builds on the 10-year ICT strategy that Power and Water developed for the previous regulatory control period that commenced in July 2019.

The rapid pace of business change, technology innovation and adoption, and the fundamental importance of 'information' demands that a coherent strategy is in place to provide direction to, and investment in, ICT. This strategy involves:

- Identifying ICT responses into the future (5 to 10 years) to meet business requirements.
- The strategic principle of developing and implementing fit-for-purpose systems and processes that consider safety, cost efficiency, business priorities, and industry standards.
- Providing context for the procurement and management of ICT systems to a standard that enables the operation of an efficient, safe, secure and reliable network.
- Enabling the distribution system to remain sustainable and secure and reflects prudent and efficient opportunities to introduce new and innovative technology options to optimise how services are delivered to our customers.

This document describes Power and Water's overarching strategy and decisions concerning ICT and how these result in efficient ICT capital and operating expenditure that supports the long-term interests and expectations of customers for Standard Control Services (SCS) under our regulated electricity distribution services.

This document also outlines the forecast expenditure program for the 2024-29 regulatory period to meet Power and Water's strategic objectives and operational business requirements.

2 Operating environment

2.1 Overview

Power and Water is a Northern Territory Government ('NTG') Owned Corporation (GOC) operating under the *Government Owned Corporations Act 2001* (GOC Act). As a multi-utility, Power and Water provides a range of electricity, gas, system control, water, and sewerage services. The business model encompasses water management, network distribution, remote services operation, environment and regulatory services and corporate administration.

As the Network Service Provider (NSP) for the Northern Territory, Power and Water has responsibility for planning, building, operating and maintaining safe, efficient, reliable and cost-effective electricity networks to transmit electricity between generators and consumers, supporting the growth of the Northern Territory economy. Power and Water's vision is:

A proud, trusted, modern multi-utility delivering value now and into the future.

The three regulated networks in the Northern Territory that Power and Water is responsible for are:

- The northern network, which services about 150,000 people and stretches from Darwin to the south of Katherine including Batchelor, Adelaide River, Pine Creek, Mataranka and Larrimah
- The Tennant Creek network, which services about 7,000 people in and around Tennant Creek
- The southern electrical grid, which services the Alice Springs area of approximately 28,000 people.

Power and Water's ICT systems play a vital part in providing or supporting our electricity distribution services. Major ICT business systems include the energy management system (EMS), asset management system (Maximo), geographic information system (GIS), data analytics, and revenue management system.

With our unique, complex operating environment and small customer base, Power and Water is transforming into a more efficient, customer-focused and responsive organisation able to meet the needs of our customers and to support the economic growth targets of the NTG.

2.2 Power and Water's Strategic Objectives

Power and Water has experienced significant changes in its regulatory, economic, industry and social environment in the past five years, and with this in mind the organisation tested its strategic direction to ensure that it can continue to meet the changing needs of the business, its customers, and the Northern Territory economy and market. Power and Water's strategic direction now has a more targeted focus designed to successfully position itself for the future.

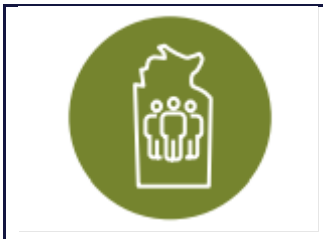
Power and Water's Purpose and Vision links to the refreshed strategic goals and objectives as outlined in Figure 1 below. The strategic intent is to provide optimum ICT management to enable Power and Water to achieve its strategic priorities and objectives.

Figure 1: Power and Water's Strategic Framework

Table 1 provides an overview of the alignment between ICT and Power and Water's strategic pillars.

Table 1 Alignment areas between Power and Water's planned ICT developments and the Corporate Strategic Pillars

Power and Water Strategic Pillar	What are we doing differently?	What does this mean for ICT
One Power and Water 	Power and Water is **committed to implementing its Operating Model and uplifting its culture** to become fit for the future	Power and Water will operate as one enabled by a sustainable operating model. Power and Water's focus is on uplifting its culture, improving capabilities with new ICT systems and enhancing the way it works through a new organisational structure and embedding a continuous improvement mindset.
Always Safe 	Power and Water puts its people and customers **safety first in all that it does**	Safety is Power and Water's legal and corporate obligation to its people and all Territorians. The corporation will continue to deliver on safety targets and proactively improve its safety culture to better ensure safety for its people and for all Territorians. This includes managing ICT assets and implementing ICT security measures to ensure the safety of employees, contractors and the public.
Customer and Community at the Centre	Power and Water places its **customers and**	Customers and community are at the centre of our business. Power and Water's focus is on

	**community at the centre** of its attention	improving customer experiences, cultivating relationships and being a trusted partner with its customers, community and stakeholders. As part of this strategic pillar, Power and Water will continue development of ICT solutions to improve consumer interaction processes with the business.
Living Within Our Means 	Power and Water **lives within its means** to ensure commercial sustainability	Power and Water continuously strengthens its financial management practices and optimises revenue generation. It spends money wisely and practices prudent cost management. One of the key ICT-led strategic programs involves leveraging information as an asset. This addresses an increased need for integrated information to analyse, optimise and manage organisational performance.
Sustainable Solutions for the Future 	Power and Water has **clarified the big shifts** required based on the challenges it will face over the next 10 years	Power and Water proactively enables sustainable services in the Northern Territory for the future. As part of this strategic pillar, ICT is carrying out the Implement Smart Systems and Advanced Technology strategic program. This involves investment in emerging technologies to develop innovative propositions and solutions for our customers.

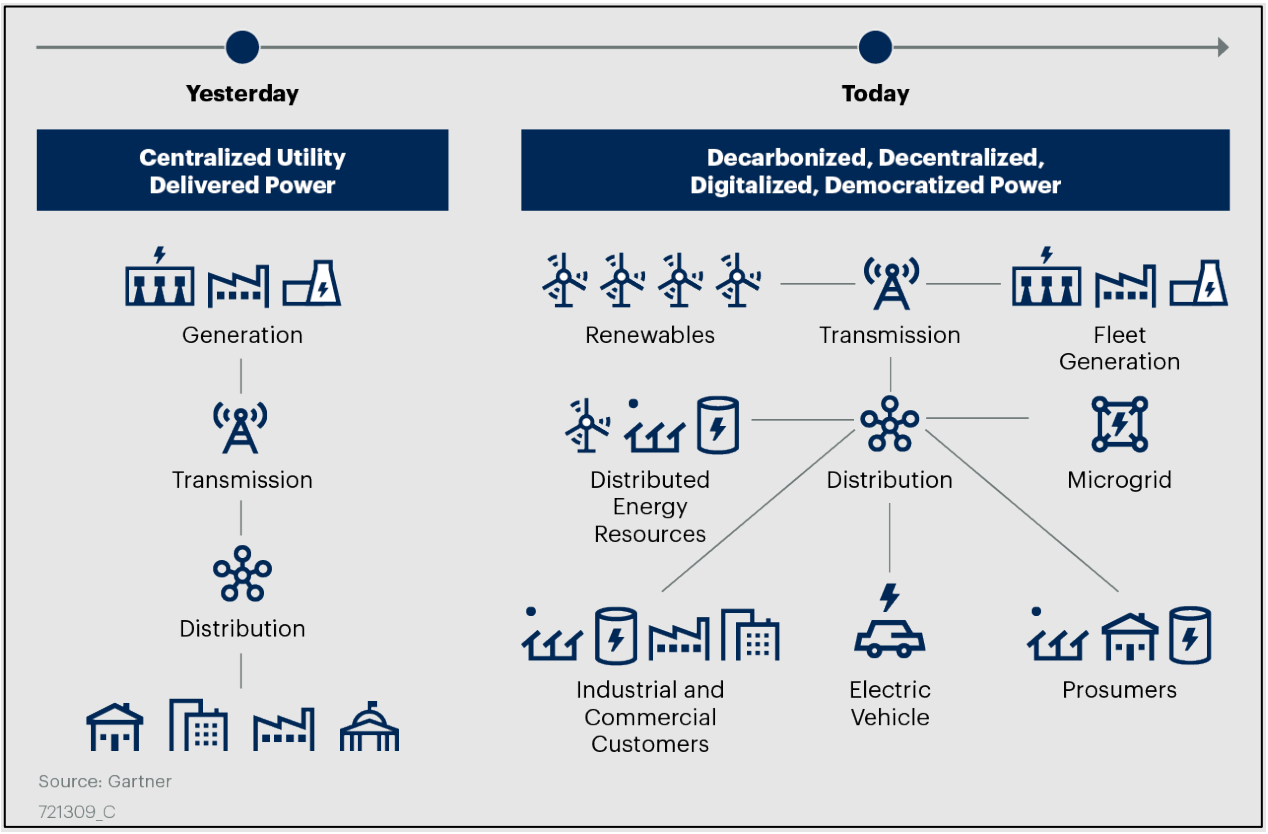
2.3 Electricity Industry Trends

The Darwin-Katherine Electricity System Plan provides a clear roadmap for how the Northern Territory will transition to a cleaner and more affordable energy future. Importantly, it outlines a range of key initiatives that will enable the Northern Territory to achieve its 50 per cent renewable energy target by 2030. Power and Water is excited about supporting the implementation of the Darwin-Katherine Electricity System Plan. Power and Water will play a critical role over the coming years in supporting the connection of the proposed Renewable Energy Hub, increasing small-scale solar, virtual power plant capability (VPP), and developing better ways of managing network demand. Investing in the right operational technologies to modernise the electricity networks will enable integration of renewable energy and transition more efficiently to becoming an enabling platform that better supports customer choice around how they use and consume electricity and enables the development of new products and service offerings.

There are also a number of technology trends which are influencing the nature of how products and services are delivered within the utilities sector.

The figure below provides a snapshot of the overall utility industry trends that Power and Water needs to consider when undertaking ICT business planning.

Figure 2: Utility industry direction



Power and Water is aware of, and is responding to the influences above, as well as a range of other trends impacting our market and services, via:

- Pursuing 'sustainability' as a key driver in all areas of our business operations
- Seeking internal efficiencies to optimise costs associated with providing power and water services
- Responding to cyber security threats and changing landscape
- Assessing appropriateness on cloud managed systems and impact to cost and operations

- Exploring artificial intelligence and machine learning enabling automation and self-healing systems, as well as the deployment of predictive maintenance systems
- Leveraging the digital transformation capabilities provided through 'smart' technologies to improve customer satisfaction levels, enhance information availability through the integration of information technology systems and operational technology systems (IT/OT Convergence), redesign organisational processes and enhance distribution network asset utilisation efficiency
- Reengineering field operation processes and workflow through the take-up of mobility and other productivity enabling technologies
- Improving data governance by making better information available, visible and manageable
- Managing compliance within the evolving regulatory environment
- Adapting to Multi-cloud and hybrid hosting and service models.

Power and Water is progressing initiatives to respond to these trends as part of the Future Networks Readiness Plan, and the results inform our future network ICT expenditure requirements.

In addition, electricity market reforms have required an increased focus on implementing necessary system changes to enable the market rules and procedures that facilitate the development of the Northern Territory Electricity Market (NTEM). These changes are required to cater for the increasing number of generators in the market as well as improving operational transparency in Power and Water's System Control and Market Operator roles.

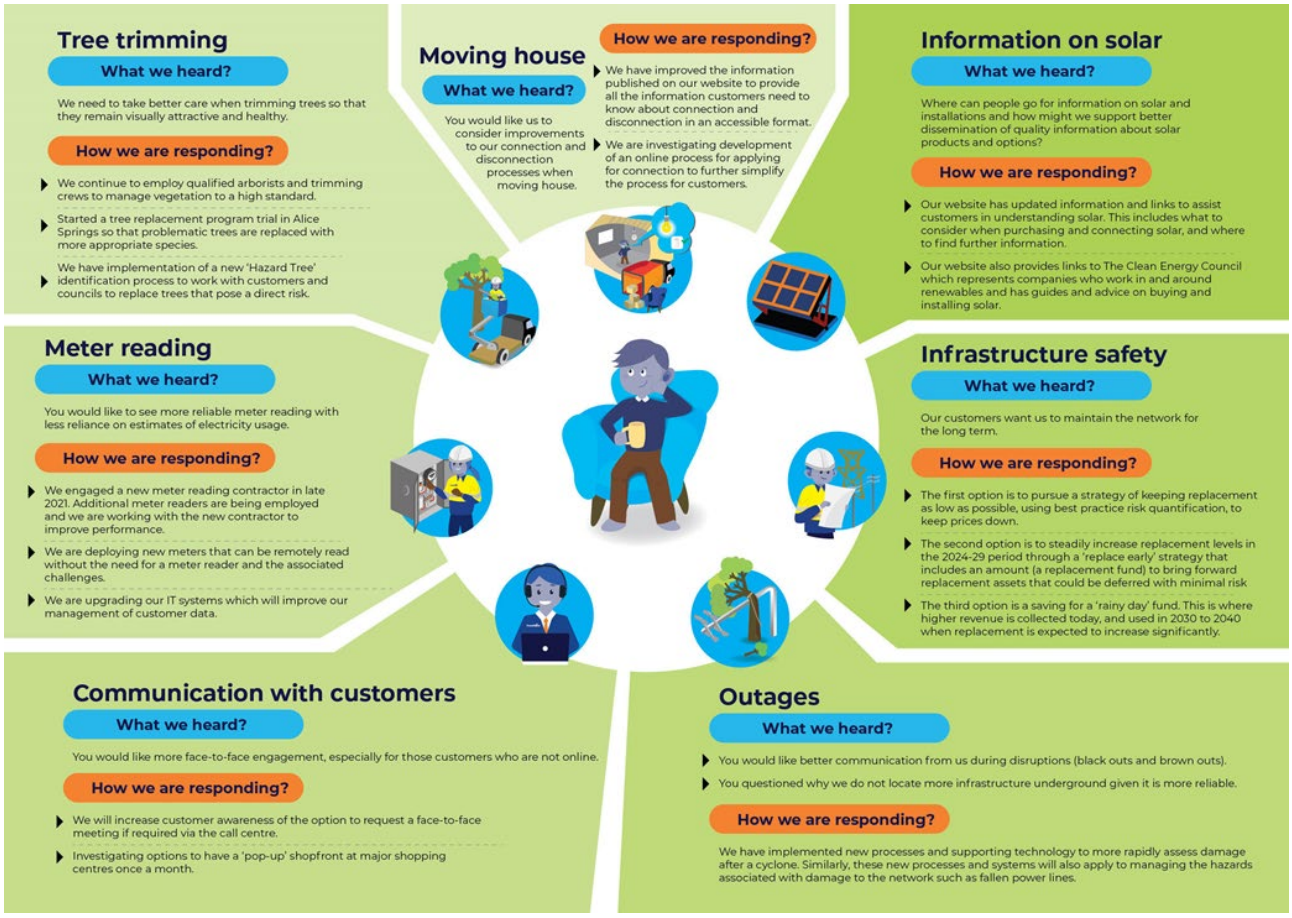
2.4 Customer Expectations

Power and Water has developed an extensive engagement program to support plans for the electricity network. This has started with an understanding of what matters to customers and understanding their values, vision and priorities.

The extreme heat coupled with the humidity in the top end means that customers consume more energy per customer than many in Australia, with peak demand in summer relatively high. As an isolated region, Power and Water also has more customers on low incomes compared to many other places in Australia, meaning electricity affordability is even more crucial. The Northern Territory also comprises a unique mix of urban, suburban, and rural customers.

The figure below communicates what our customer wants to experience and is a driver for our technology investments.

Figure 3: People Panel feedback



Power and Water customers indirectly require ICT and corresponding operational technology (OT) changes to ensure that the distribution network remains fit-for-purpose to serve Territorians into the future:

- Customers are increasingly leading investment in their own distributed generation and battery storage options, which changes their individual and collective electricity and distribution network usage behaviours and patterns
- The growth and uptake of digital platforms by customers (e.g. web, mobile, and enhanced collaboration) is triggering a gradual change in preferred communication channels - alongside the increasing number of smart meters on the network, this trend is also helping to enable customers to utilise demand response
- Electric vehicle uptake is expected to increase - this could lead to demand increases from the distribution network in evenings when solar or battery storage is unavailable.

In response, Power and Water has aligned these opportunities with new ICT-enabled projects.

2.5 Cyber security landscape

Increasing prevalence of cyber-attacks has lead the Federal government to instigate legislative changes to improve the robustness of critical infrastructure cyber security.

With the amendments to the security standard under the *Security of Critical Infrastructure Act* ('SOCI Act') there is an increasing requirement on improving ICT security and physical security. This is leading to additional cost to achieve and then maintain an acceptable level of cyber security. Developing a strong cybersecurity position to protect our IT/OT assets is a major priority, and we have therefore made changes

during the 2019-2024 regulatory period to enable us to comply with the SOCI Act in the required timeframes.

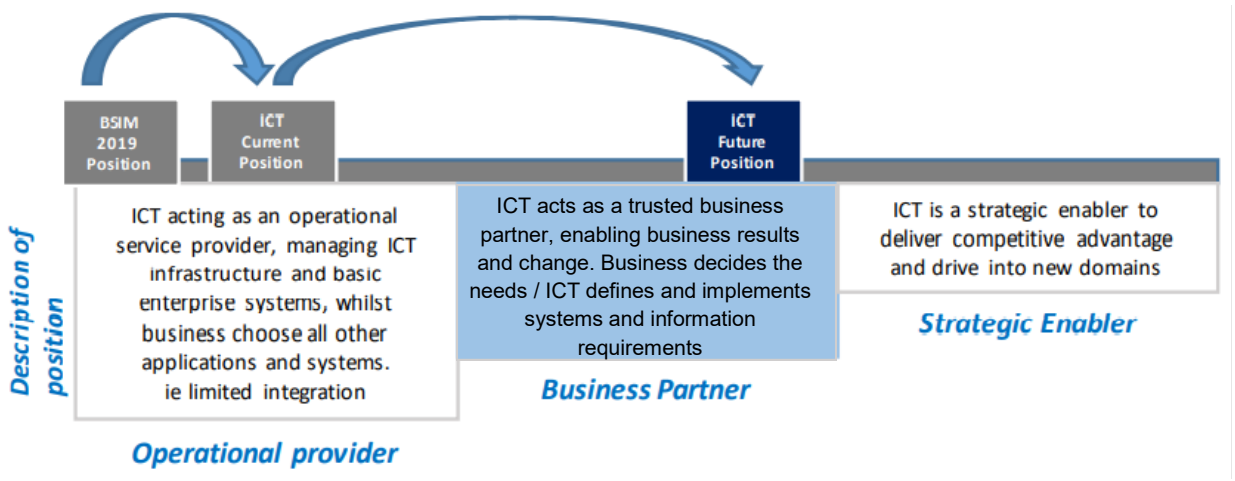
Further cyber security measures will be required in the next RCP to respond to the worsening cyber-attack landscape. Power and Water is utilising the Australian Energy Sector Cyber Security Framework (AESCSF) to plan, deliver, monitor, mature and maintain its cyber security capabilities. Power and Water proposes achieving at least Security Profile Level 2 within the upcoming regulatory period. To achieve this cost-effectively, Power and Water is establishing industry partnerships to fill capability gaps and leveraging the Department of Corporate and Digital Development (DCDD) who manage end user, data centre and IT network cyber defence for the NTG. Power and Water also participates in cyber security exercises at a national level in conjunction with DCDD for both electricity and water sectors, involving both corporate and OT teams.

3 ICT strategic overview

3.1 ICT strategic objective

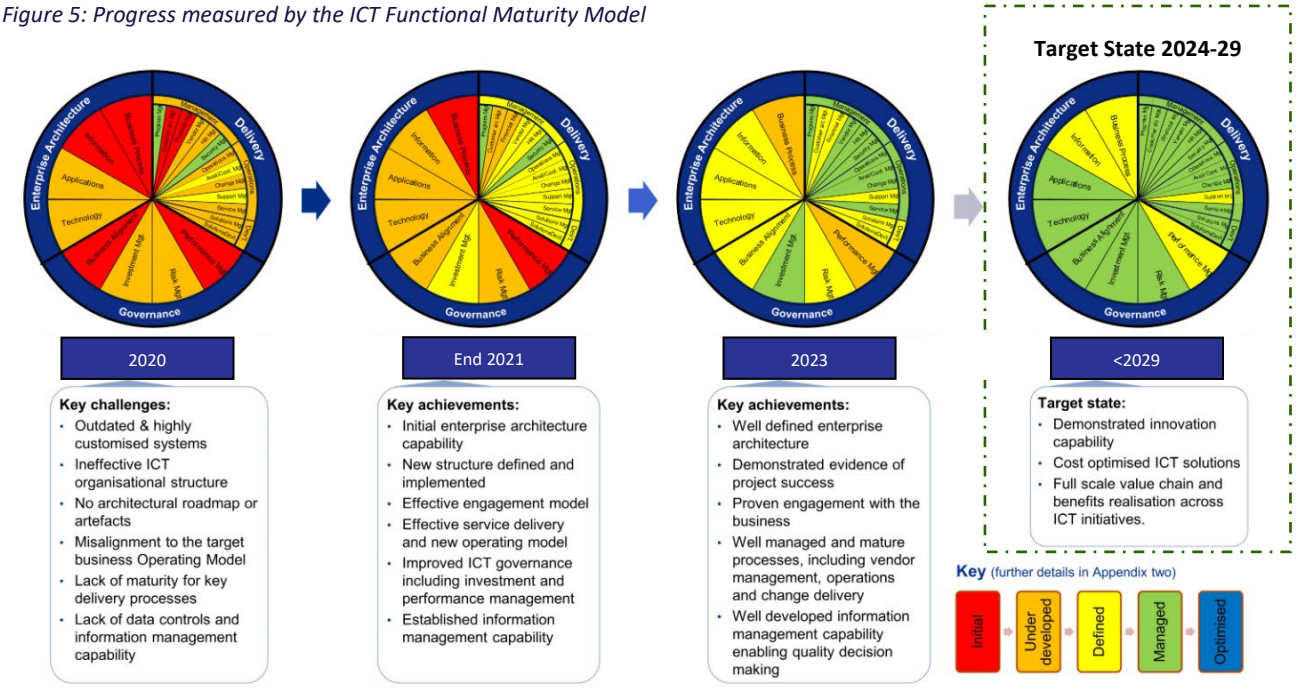
Power and Water has identified that the ICT function needs to move from being predominantly a base operational service provider to a genuine business partner that enables business change. This change commenced in early 2020 and will require a further step change in both ICT capability and culture. The figure below provides the proposed stages to achieve this positioning of the ICT function, with the strategic objective of ICT as a ***'trusted business partner'.***

Figure 4 ICT strategic objective is to be a 'Trusted Business Partner'



ICT has a well-defined roadmap of ICT improvements which will enable the function to meet the growing and evolving demands of the market overall, and of Power and Water's operations. The figure below shows the maturity journey, demonstrating significant progress towards ICT's required level of capability. Refer to Appendix A for an explanation of the coloured maturity level implications for Power and Water.

Figure 5: Progress measured by the ICT Functional Maturity Model



3.2 ICT strategies

Three ICT strategies have been identified to respond to Power and Water's challenges in supporting the business as it responds to the industry changes and to customer feedback:

1. Establish contemporary, fit-for-purpose digital capabilities driven by the business' requirements
2. Achieve a robust level of cyber security
3. Build ICT resource capability.

Each of these strategies is expanded upon below.

3.2.1 Digital capabilities

Power and Water's ICT systems are required to support the whole business with the delivery of an efficient, reliable, and safe network on a day-to-day basis. However, in the context of Power and Water's rapidly changing environment, we also recognise the need to uplift our capacity through modern technology solutions systems.

Many of our systems have reached the end of their useful life and do not provide the capabilities that Power and Water requires to respond agilely to changes in its network and operating environment or to meet customer expectations. Furthermore, these systems do not offer the capabilities to support the level of cyber security practices required to meet our obligations under the SOCI Act.

The need to modernise our ICT systems is becoming a growing imperative for Power and Water and is something that cannot be deferred. Investing in ICT to help modernise our systems and management practices will result in a short-term affordability impact, however, it will deliver better performance and reliability to customers over the longer term, through technological improvements.

Power and Water will explore fit-for-purpose, affordable, and sustainable hosting options, including cloud-based options. However, if an on-premise option is fit-for-purpose, available, and more affordable, it will be adopted. Power and Water has invested in several cloud-hosted systems to date, including the

Performance Achievement System, the learning and development system, the Health and Environment Risk Compliance System, the Retail Management System, and solar forecasting tools. Various challenges have presented themselves in these investments, including the complexity of the software upgrades and increases in operational costs.

Whilst we have made improvements through targeted investments in the current RCP to date, we recognise the need to prudently manage all activities prudently, ensuring that systems are scaled appropriately so that costs can be minimised for customers.

We commenced our ICT Transformation Program in the 2019-24 period, with two large projects - our meter and billing system ('Meter to Cash' or 'M2C') and the commencement of an upgrade to our Energy Management System ('EMS'). We have re-prioritised our ICT refresh program compared to our regulatory proposal, accounting for our capacity to deliver the work following the disruption caused by the pandemic.

3.2.2 Cyber security

The recently revised SOCI Act requires certain minimum cyber security levels of organisations responsible for critical infrastructure, such as Power and Water. To respond to the increased threat of cyber-attack and to meet our compliance obligations, we will focus on achieving Security Profile 2 (SP-2) cyber security maturity level as measured against the AESCSF within the next five years. On the path to SP-2, Power and Water will invest in improvements to practices and skills to achieve SP-1 by the end of the current RCP.

3.2.3 ICT resource capability

Contemporary scalable and highly available ICT systems require new skills and capabilities to both deliver and support them. New suitably qualified and experienced staff will be sought to supplement existing internal resources, who will receive extra training. There will remain a reliance on external service providers to help with all facets of project development, but with Power and Water at all times retaining responsibility for project management and program governance. A resourcing and delivery plan has been developed to complement this strategy.

3.3 ICT principles

The following principles guide ICT infrastructure development and maintenance:

- **Maximize enterprise-wide benefit** – Information and technology decisions are made to provide maximum benefit to Power and Water as a whole
- **Simplify before automation** – simplify, rationalise and consolidate business processes prior to automation where possible. ICT solutions will only be considered after there is clarity on the business operating model and direction
- **Common use applications** – wherever practicable, implement applications that can be used across the enterprise rather than applications that will be provided to only a particular part of the business
- **Optimise total cost of ownership** – business cases and other investment decisions will consider all the costs associated with a system over its entire life span to help ensure cost-effective planning and decision-making processes
- **Business responsibility for business outcomes** – Business units are responsible for achieving planned business outcomes from information systems that are delivered in accordance with their business needs and requirements.

4 Current ICT Operational Arrangements

4.1 Responsibility for ICT

As a GOC, Power Water is required to comply with the applicable policies, standards and guidelines that apply to the design, development and operation of all ICT systems across Northern Territory Government Agencies.

Within Power and Water, the ICT function provides services for IT and OT, focusing on support and enhancement for business applications, architecture, system design and operational management. Many of Power and Water's services (and resources) are provided through outsourcing contracts that are either managed at a whole of government level or are managed directly by Power and Water.

Power and Water employs a shared services delivery model across its portfolio of assets, with a high proportion of technology common across its business units. Where sharing of systems is appropriate or efficient, Power and Water allocates costs to the relevant subsidiary business according to its AER-approved cost allocation method ('CAM').

4.2 Key governance attributes and mechanisms

Power and Water has comprehensive governance structure (refer to the figure below), with supporting policies, plans, and processes covering business planning, investment management, and ICT. Each of the decision-making bodies from the Power and Water Board through to individuals maintain appropriate charters and terms of reference to ensure transparent and effective governance.

Figure 6 Power and Water's governance model for ICT investment decisions and approvals

Power and Water's ICT expenditure governance framework is developed to ensure:

- Alignment with corporate strategy and priorities
- It enables and facilitates the ICT operating model within the business
- There is formal and disciplined ICT investment planning
- There is clear ownership and accountability
- It adopts and follows good practice risk management discipline
- Collaboration between ICT and other business operating units influences the direction and prioritisation of ICT expenditure.

Key decisions and approvals for ICT are performed as follows:

- **The ICT Strategy** document is submitted by the General Manager ICT for approval by the Executive Leadership Team.
- **The ICT Business Unit Plan** is submitted by the General Manager ICT for approval by the Executive General Manager Core Operations and subsequent inclusion into the Core Operations Business Unit Plan.
- **ICT Annual Investment Program** is submitted by the General Manager ICT for approval to Executive General Manager Core Operations for subsequent inclusion into the Core Operations Business Unit Plan.
- **ICT investments (Capex) required to support business initiatives** are identified and proposed by the business unit representatives and submitted for endorsement at the Architecture Review Board and Approval by the Executive General Manager Core Operations or above (depending on expenditure).
- **Investments (Capex) required for ICT Assets** (servers, PCs, etc.) are requested by ICT using a lifecycle management approach (risk-based) and approved through the ICT Annual Investment Program and budget process and noted at the Architecture Review Board.
- **ICT Operational Expenditure (Opex)** is part of the wider Core Operations expenditure plan and is submitted and approved through the annual budget process as part of the ICT Business Unit Plan.

4.3 ICT Systems

The table below lists the core and supporting corporate ICT systems by business area.

Table 2 Power and Water ICT Systems and Associated Business Capabilities

Business Capability	ICT System(s)	
Corporate (Human Resources, Finance, Procurement, etc.)	• Oracle Enterprise Suite (Financial Management) • IBM Cognos TM1 (Budgeting) • Northern Territory Government PIPS (Personnel & Payroll)	• SAP Business Objects (Data Warehouse and Reporting) • HP Records Manager (Electronic Document Management) • Contract and Procurement Services (CAPS)
Asset & Works Management	• IBM Maximo • ESRI ArcGIS	• OSI PI
Revenue Management	• Gentrack Retail Management System	
Meter Management	• MV-90 • Gentrack Retail Management System	• MV-RS
Data Management / Business Intelligence	• Cognos TMO • Business Intelligence and Reporting Tools (BIRT)	• SAP Business Objects
Operations	• Aveva (Citect) SCADA	

Business Capability	ICT System(s)
Communications	• Whispir • Q-Master • Genesys

4.4 ICT Operational Model and Capabilities

It is critical for business efficiency that Power and Water's ICT infrastructure remains fit for purpose, reliable and secure. Power and Water's ICT Operating Model was developed to achieve these aims in accordance with both ICT and broader Power and Water strategic goals by ensuring the effective supply of ICT service to meet business needs.

The value chain that Power and Water has implemented to improve its capabilities in line with corporate strategic goals includes the following steps:

- **Plan** – Decide what systems, technology and data we need, how to select, manage and link them and how best to move away from current systems
- **Build** – Implement systems, set them up, make them link correctly, deliver changes and manage third parties
- **Run** – Ensure systems operate effectively and efficiently, are available at the right times and locations and have been benchmarked
- **Inform** – Define and create a consistent model for viewing, discussing and using data to make better holistic decisions by having a single source of truth
- **Secure** – Protect our people and assets from outside threats, ensuring only the right people have access to data.

Power and Water is also continuing to explore further dimensions of the IT Operating Model, with key focus areas including:

- **Processes** – build maturity of processes across the ICT lifecycle, with a focus on standardisation, quality and risk
- **Performance** – improved identification of performance measures to drive business value from ICT investment
- **Organisation and People** – ensure ongoing investment in skills and capability to deliver to Power and Water's current and future ICT needs. Attract and retain people with wider skills in business management, vendor management and information management, rather than pure technology skills.

5 Expenditure plan

5.1 Summary of current regulatory period

In the 2019-24 period, we commenced a journey to refresh our ICT systems under the 'Remediate the Core' Program.

In April 2019, Power and Water received the AER's Final Determination for the 2019-2024 regulatory period which included ICT capex of $32.1M ($2018) of which $19.8M was directly related to the Transformation Program initiatives. The ICT budget for the rest of the ICT program for the current RCP was $28M ($11.8M SCS).

The Transformation Program was designed to lift organisational capabilities and efficiencies across the dimensions of People, Process, and Technology. A three-year planning cycle that involved all Power and Water functions was completed and the "Target" state defined. The first step was to agree business unit resourcing, which included transitional roles to boost resourcing across the business to improve deliverability success. ICT completed its restructure in January 2021.

Several exogenous factors, including the impact of COVID-19, impacted Power and Water's ability to meet the objectives set out in the 2019 AER submission and the Transformation Program was reprioritised taking into consideration the following key principles:

- Ensure regulatory compliance
- Manage core system risk
- Live within means
- Align to Northern Territory Government constraints
- Sequence for certainty.

The Transformation Program was revised and renamed the Operating Model Program (OMP) in mid-2021. A key aspect of the Operating Model Program involves updating Power and Water's ageing ICT systems, including implementing new meter data management, billing and financial management systems.

Power and Water collectively decided to adjust the delivery method of the program for three reasons:

- Reduce delivery risk.
- Incorporate changes to Power and Water's structure.
- Incorporate process efficiencies.

As a result, the Operating Model program was bolstered with the recruitment of a General Manager and Program Director to oversee the delivery of the Meter to Cash, Customer Experience, and Physicals to Financials projects. This was followed by recruitment of speciality resources and a business analyst to establish an internal system integrator capability. This has had the additional benefit of de-risking the deliverability of large ICT projects, and streamlined ICT's ability to deliver smaller asset lifecycle, innovation, and efficiency-based projects.

A summary of the project scope, benefits and sequencing is included in the Operating model narrative and Capability Uplift project (OMP) business case.

We show the actual and estimated ICT expenditure (including the OMP) compared to the AER allowance for the current RCP of $35.3 million ($2022). Power and Water is on schedule to successfully deliver over 120 ICT initiatives in the current RCP, with a total expected capex of $45.5 million. Refer to Appendix B for more information.

Table 3 Current Period Performance against AER Allowance - includes Operating Model program ($m, real 2022)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total
AER Allowance	7.3	7.1	6.8	7.3	6.9	**35.3**
Actual / Estimated	6.2	1.7	3.9	16.0	17.7	**45.5**
Variance	(1.1)	(5.4)	(2.9)	8.7	10.8	**10.2**

In addition to the impacts of COVID-19 associated with internal and external resources being constrained as well as global supply chain delays noted above, we commenced projects earlier than originally scheduled and contributed to lower expenditure early in the regulatory period. This included the 'GIS decoupling and staged upgrade' project in 2018, which was earlier than forecast in the 2019-24 Regulatory Proposal.

The projected expenditure over the AER allowance by the end of the regulatory period is due primarily to:

- Increased expenditure on cyber security that was not envisaged when preparing the 2019-24 Regulatory Proposal.
- Reduction in shadow IT and the centralisation of ICT delivery cost.
- ICT investment required to support NTG's renewable energy target.

5.2 Forecasting Methodology for next regulatory period

At a high level, three steps have been applied when developing the forecast ICT capital expenditure for the 2024-29 regulatory period.

- **Identifying strategy** – The starting point for our expenditure forecasts is to understand our changing environment over a longer-term horizon. Our strategy is informed by the feedback provided by our customers on values, vision, and priorities for investment.
- **Bottom-up plans** – We identify key drivers of investment and then undertake needs and options assessment to develop a bottom-up list of projects and plans over a 10 year horizon.
- **Top-down portfolio review** – A portfolio view helps identify the optimal mix of projects and programs that provide optimal value, align with longer term investment priorities, deliver customer preferences and with an assessment of deliverability.

5.3 ICT Roadmap

Power and Water has developed an ICT Roadmap which shows the timing of new or upgraded capability being introduced due to customer demand, IT system lifecycle management, risk management planning or alignment with new regulatory obligations. The next period forecast is primarily driven by projects for the:

- Regular periodic replacements of hardware and software
- Need to manage compliance with the evolving regulatory environment
- Maintaining the security of the network and its customers
- Shifting consumer interactions with the distribution network
- Optimisation and integration of business processes and ICT systems
- Need to meet evolving customer needs and expectations.

These projects are outlined in the figure below. All but the Customer Connectivity and Field Device and Telephony projects in the 'Run' category are part of the ICT Operational Model value chain.

Figure 7 ICT Roadmap for 2024-29 regulatory period

Category	Project Name	FY23	FY24	FY25	FY26	FY27	FY28	FY29
1. Plan and Build	Data Warehouse (Physical)							
1. Plan and Build	OT Capability Uplift							
2. Run (Ops)	FMS Technical Upgrade							
2. Run (Ops)	Hardware Replacement							
2. Run (Ops)	ICT Minor Projects							
2. Run (Ops)	Infrastructure Management							
2. Run (Ops)	Integrated Communications							
2. Run (Ops)	Maximo Technical Upgrade							
2. Run (Ops)	Software Replacement							
3. Run (Service)	Customer Connectivity							
3. Run (Service)	Field Device & Telephony							
3. Run (Service)	Service Delivery							
3. Run (Service)	Service Model							
3. Run (Service)	Physical to Financials							
3. Run (Service)	Asset Management + Capital Project Delivery							
4. Inform	Data and Reporting Programs							
4. Inform	Information Management							
5. Secure	Cyber Security							

The key benefit areas and outcomes associated with the proposed projects in the ICT program over the upcoming regulatory period are outlined in the figure below.

Figure 8 Key benefit areas and outcomes from the ICT Program in the Next Regulatory Period

Category (ICT Function)	Benefit Area	Primary Outcome/s
1. Plan and Build	Architectural & Roadmap adherence	Improved ability to consistently plan, deliver and control information and technology-enabled investments.
	Architectural Completeness	Improved ability to understand and trust current state information to support better strategy, planning and delivery through scope, impacts and dependency management.
	Operational Technology and Renewables Support	Improved data quality and completeness to enable and deliver operational technologies across DMS, OMS, DERMS, WAMS and GIS.
	ICT projects delivered on time and on budget	Improved ability to scope, structure, size and manage delivery of ICT projects.
	ICT Project Stakeholder satisfaction	Improved abilty to communicate, engage and inspire project stakeholders from inception through to operational systems.
2. Run (Ops)	Operational Availability	Improved availability of critical and core applications and technologies through better ICT asset management, environment management, service management and connectivity.
	Operational Responsiveness	Improved ability to respond to operational and customer requirements through modern platforms and techniques supprting change, environment and infrastructure management.
	DR preparedness	Improved ability to demonstrate disaster recovery processes in line with business priorities and the risk profile of the enterprise.
4. Inform	Information Completeness	Improved ability to define, capture and maintain quality information with tooling to support discovery, quality analysis, gap analysis and data custodianship.
	Information Self-Service	Reduced effort for ICT information workers and Business information workers in finding, manipulating and reporting information for recurring and historical purposes.
	Information Management Practices	New ability to create, maintain, manage and govern trustworthy data through centralised data warehousing, standardised tooling, and a consistent and maintained data model.
5. Secure	Security Preparedness	Improved ability to plan and deliver initiatives and solutions to predict, prevent, detect, respond to, and recover from cyber security incidents.
	Security Awareness	Improved and continuously evolving organisation-wide awareness of cyber security threats and knowledge appropriate courses of action to mitigate these threats.
	Security Testing	New ability to pre-emptively build and implement strategies and plans to identify and address testing needs to demonstrate and remediate potential vulnerabilities.
	Security Governance	Improved ability to govern IT and OT security through the application of the AESCSF and supporting frameworks to uplift security practices, information, technology and services.
3. Run (Service)	ICT Overall People	Improved culture of accountability and delivery via a consolidated ICT Operating Model which supports clarity of process, outputs, ownership and collaboration.
	Operational Customer Satisfaction	Improved ability to engage with customers, and to measure and effect improvements in line with their priorities.
	Operational Budget	Optimised year on year costs across solutions, services and technologies.
	ICT Overall Financial Management	Improved ability to benchmark, plan and to responsively and consistenly manage ICT's finances in line with business constraints.

5.4 ICT projects proposed for the next regulatory period

The proposed ICT projects for the next regulatory period have been developed cognisant of the AER's ICT Assessment guidance note and have classified the projects as either recurrent or non-recurrent or a combination of the two and identified the potential benefits to the business and customers. Refer to the table below.

Recurrent projects and programs typically entail refreshes and updates within five years. Recurrent expenditure is necessary to maintain the current level of service and risk. Recurrent expenditure is expected to be reasonably level in real terms and includes end-of-life replacements or major upgrades of our core systems.

Non-recurrent projects are typically one-off investments to introduce new capability in response to a new business need and/or a regulatory obligation. Non-recurrent projects can also involve replacement of existing systems, but with a life-cycle of more than five years.

Table 4 ICT Programs planned for the next RCP

PROJECT NAME	DESCRIPTION	RECURRENT / NON-RECURRENT	NON-RECURRENT SUBCATEGORY	BENEFITS
Information Management	To improve RIN data, this project will improve data governance and embed the use of the Enterprise Data model.	Recurrent/ Non-recurrent (50%/50%)	Compliance and new obligations	Improved RIN data and quality of reporting
Field Device and Telephony Communications Upgrade	All 3G enabled devices, such as modems and SIMs, need to be replaced with 4G or 5G enabled technology.	Recurrent/ Non-recurrent (50%/50%)	Maintaining existing services or functionality	This will increase network device visibility and provide Power and Water with the ability to roll out smart meters and improve service reliability.
Software Replacement	Routine software management is required to improve service delivery.	Recurrent	N/A	Improved service delivery
Hardware Replacement	Routine software management is required to improve service delivery.	Recurrent	N/A	Improved service delivery
ICT Minor Projects	The budget for this project covers any unforeseen ICT projects and initiatives for all of ICT.	Recurrent/ Non-recurrent (50%/50%)	Compliance and new obligations	Varies based on the actual projects that are identified annually and approved
Customer Connectivity	This project looks at correcting the customer connectivity model between the systems of RMS, MAXIMO (enterprise asset management software),	Non-recurrent	Compliance and new obligations	Resolving this issue will improve the connectivity model and therefore outage management and network planning

PROJECT NAME	DESCRIPTION	RECURRENT / NON-RECURRENT	NON-RECURRENT SUBCATEGORY	BENEFITS
	Meter Data Management System (MDMS) and GIS.			
Cyber Security	The Security Legislation Amendment (Critical Infrastructure) Bill 2021 (Cth) amended the scope of the SOCI Act to include the energy sector.	Recurrent/ non-recurrent (27% /73%)[2]	Compliance and new obligations	This project will address the newly applicable requirements regarding cyber security, which will in turn improve both cyber security and overall network security for Power and Water.
Physical to Financials (part of OMP)	This program falls under the umbrella of the OMP. It looks at the improvement of asset management and how Power and Water's financial assets are treated.	Non-recurrent	Acquisition of new functionality	It will improve asset treatment, the capitalisation process, and ultimately Power and Water's financial performance and position.
Asset Management & Capital Project Delivery (part of OMP)	Enable the optimisation of assets by effectively balancing cost, risk, and performance. Deliver projects effectively and efficiently from capital project planning, scoping, project management, and execution	Non-recurrent	Acquisition of new functionality	Improved operational performance and leveraging economies of scale (as a multi-utility) by standardising processes and systems. Improved capital planning and maintenance strategies Improved network performance and resiliency Improved support for regional and remote communities
Optimise Service Delivery (part of OMP)	Support efficient and effective work planning, scheduling, dispatching, and closeout processes	Non-recurrent	Acquisition of new functionality	Optimise planning and delivery of works management activities across field operations
Operational Technology Capability Uplift	The OTCU project allows for real-time distribution monitoring, optimisation and control.	Non-recurrent	Acquisition of new functionality	It will allow Power and Water to streamline distributed energy resource management, improve outage management and simplify complex device integration.

[2] Across the whole project, noting that it commences in FY23 and concludes in FY29

5.5 Summary of forecast capex for the next regulatory period

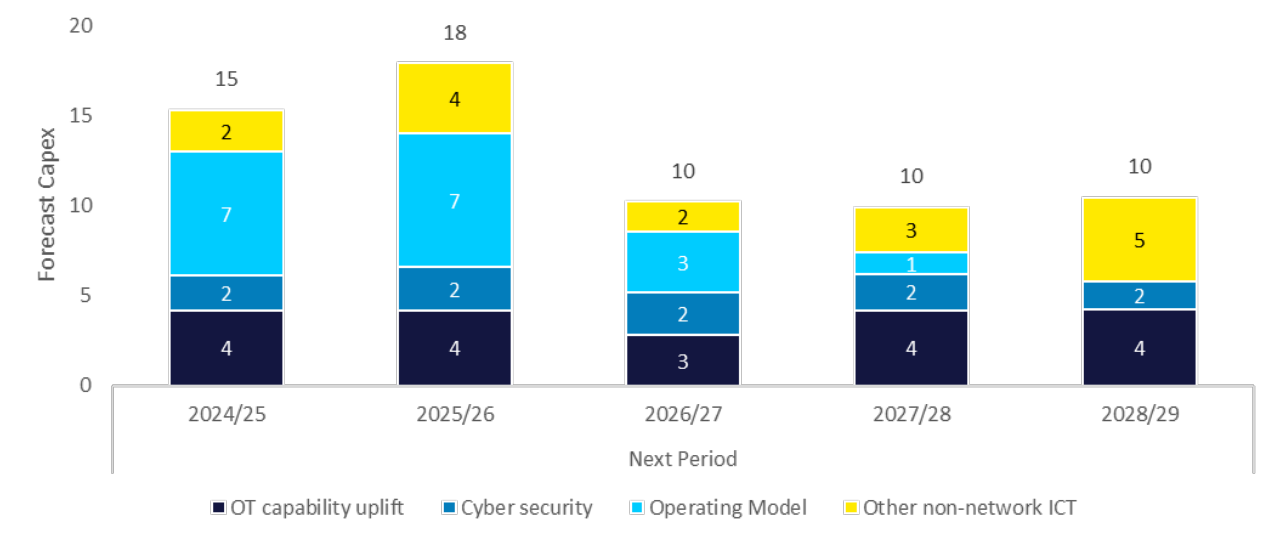
Table 5 below provides an overview of the forecast expenditure required to deliver the identified ICT projects for the next regulatory period allocated to the regulated network according to the AER approved cost allocation method.

Table 5 Forecast Capital Expenditure for 2024-29 regulatory period ($m, real 2022)

	2024-25	2025-26	2026-27	2027-28	2028-29	Total
ICT Capex	15.3	17.9	10.2	9.9	10.5	63.8

The figure below shows the expenditure profile for the next regulatory period. It shows that 76% of the ICT capex forecast is driven by three major projects: OT Capability Uplift, Cyber security, and the Operating Model Program. The three solutions will also require a significant step change in operational expenditure, but nonetheless they represent the best overall solution.

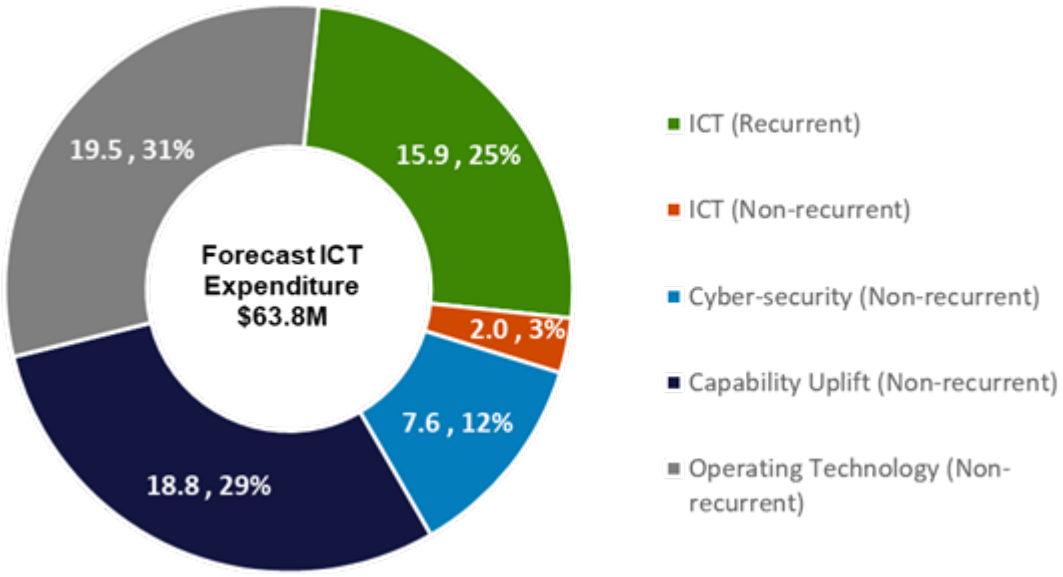
Figure 9 ICT capex forecast for the 2024-29 regulatory period ($m, real 2022)



Power and Water's forecast ICT expenditure is based on a review of our current ICT portfolio and future needs requirements. ICT expenditure is incurred to replace assets on a cyclical nature based on age and the extent of vendor support provided for software and hardware. Other expenditure is incurred to meet more substantial evolving needs, such as the need for improved cyber security or distribution network visibility.

The majority of our forecast expenditure for the 2024-2029 period is non-recurrent acquisition expenditure, as can be seen in the figure below.

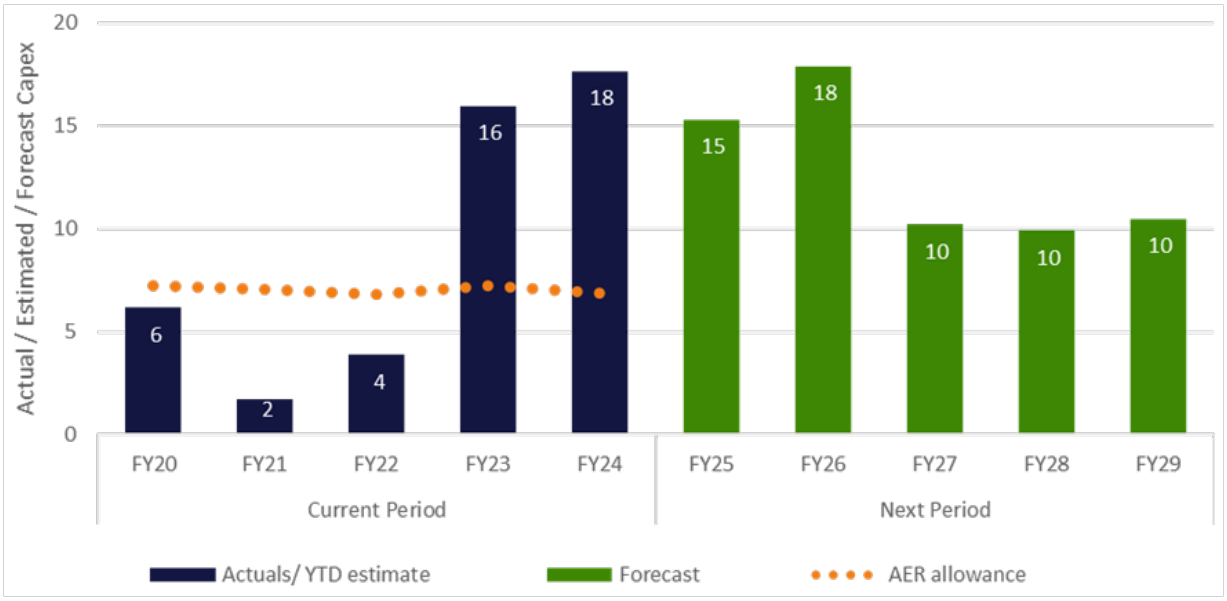
Figure 10 Percentage of ICT Capex by Category for the next RCP ($m, real 2022)



The three solutions will also require a significant step change in operational expenditure, but nonetheless they represent the best overall solution.

In the figure below, we show the comparison between the actual/estimated capex and forecast capex to provide regulated services.

Figure 11: Actual/estimated and forecast ICT expenditure to provide regulated services ($m, real 2022)



5.6 Capex and Opex Trade Offs

IT software applications are increasingly only available on cloud subscription services known as software as-a-service (SaaS). This means they can no longer be installed locally and 'owned'. SaaS applications require a lower capital outlay during establishment and upgrades but more Opex due to subscription licence costs.

Cloud infrastructure is a subscription-based opex cost and accordingly, it results in less ongoing capital costs associated with replacing IT assets but with increasing opex. For example, the cloud computing host Velocity has been adopted due to Gentrack not offering a locally hosted option as a standard offering. The implementation has led to quadrupling of the cost of service (i.e. including support, hosting, and data transfer).

Power and Water will experience a significant step change in opex over the next regulatory period and will need to ensure capex options are still considered until cloud cost are simplified and optimised to provide a more cost-effective alternative to the on-premise ownership model.

6 Sourcing and Delivery Model

6.1 Sourcing Model

The principles applied by Power and Water as part of the ICT Sourcing model are:

- 'Right source' to balance efficiency, flexibility and delivery, based on the long-term view of demand.
- Use supplier partners for technology leadership, expert advice and innovative solutions to ensure Power and Water maintains leading industry technologies.
- Use Whole-of-Government partner arrangements, where possible, to ensure efficiencies in service delivery.

In practice, these principles mean that Power and Water will:

- Use a balance of in-house resources, fixed-term contractors, and external suppliers depending on cost, availability and urgency
- Keep core ICT capabilities (planning, architecture and supplier management) in-house.
- Outsource third level application support for enterprise systems, while first and second level support is generally provided in-house.
- Source networking, desktop support and telecommunications services through whole of government contracts.

6.2 Sourcing Strategy

Power and Water's strategy for ICT sourcing involves:

- Further outsourcing of ICT application support and infrastructure to leverage external suppliers, reduce costs, and increase performance - the required partnerships and panel contracts are in place to support project demand.
- Leveraging external suppliers to provide Services Integration, reducing the number of internal resources required to manage external service provision over time and enabling greater flexibility to respond to a variable workload.
- Utilising NTG resources and the NTG Data Centre for relevant components.
- ICT restructure and recent merging with Core Operations increased ICT resource availability to manage OTU and Cyber initiatives.

Further to this ICT has engaged Ernst and Young to finalise individual AER business cases, to confirm the prudency of the sourcing strategy, and to assess skill availability and project cost. This work will commence in January 2023.

6.3 Delivery Model

Power and Water uses a combination of internal and external resources to deliver ICT projects. Projects are delivered using a mixture of Waterfall project management aligned to PRINCE2 and Agile project management. Power and Water's operational service delivery is aligned to the industry standard Information technology Infrastructure Library (ITIL) framework. Power and Water has established the Operating Model Program team which, in conjunction with ICT, is the delivery arm for OMP initiatives.

ICT also partners with the Department of Corporate and Digital Development (DCDD) for project delivery where DCDD have an established skill set or service provider. End user computing, network management and or augmentation are some of the ongoing or project services from DCDD. DCDD also provide the platform for PWC to engage many service providers ranging from Telcos to business analytic services.

ICT delivers projects depending on the complexity and skill set. As ICT manage a large footprint of hosted applications and associated infrastructure, it has developed internal capability to support both software and hardware projects. Coupled with internally imbedded service providers, ICT is well placed to manage the proposed workload.

ICT has also undergone its operating model changes and as a result it has added additional functions within its structure these include:

- Cyber – provides advisory and functional services
- Strategy and Architecture – provides technical function and strategic architecture guidance through improved governance
- Service Integration – provides end user support and business unit engagement.

ICT have also expanded its panel contracts in anticipation of the current and upcoming regulatory period workload and can access additional resourcing when required. ICT is currently working with the Enterprise Program Management Office (EPMO) to improve the prioritisation of projects to improve the scheduling and prioritisation of new initiatives.

6.4 Delivery Strategy

ICT has recognised learnings from the work delivered in the previous regulatory period in the following project delivery phase aspects:

- Project management
- Prioritisation
- Procurement improvements
- Master services and procurement
- Operating model alignment and delivery.

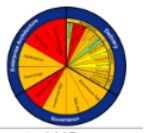
ICT recognises that procurement and associated contract negotiations can be on the critical path and has ensured that the time for this step of each project has been adequately accounted for when developing the ICT component of the Regulatory Proposal.

Appendix A. Maturity levels

Figure 12 - Maturity Levels Explained, from PWC's Board-approved ICT Strategy 2019-2024

Appendix two

Maturity criteria



The following capability maturity levels were used for this assessment. They are based on TOGAF Balanced Wheel methodology and the widely accepted US Department of Commerce ICT Architecture Capability Maturity Model.

Balanced Wheel Domains	Level 1: Initial	Level 2: Under Development	Level 3: Defined	Level 4: Managed	Level 5: Optimising
1. Enterprise Architecture	PWC's Enterprise Architecture processes, documentation, and standards are established by a variety of ad hoc means and are localised or informal.	PWC's ICT Vision, Principles, Business Linkages, Baseline, and Target Architecture are identified. Architecture standards exist, but not necessarily linked to Target Architecture. Technical Reference Model and Standards Profile framework established.	Gap Analysis and Migration Plan are completed. Fully developed Technical Reference Model and Standards Profile. ICT goals and methods are identified. The architecture aligns with relevant reference architectures.	PWC's Enterprise Architecture documentation is updated on a regular cycle to reflect the updated Enterprise Architecture. Business, Information, Application and Technical Architectures defined by appropriate de-jure and de-facto standards. The architecture continues alignment with relevant reference architectures. An automated tool is used to improve the usability of the architecture.	PWC uses a standards and waivers process are used to improve architecture development process improvements.
2. Delivery	PWC's ICT services have minimal, or implicit linkage to business strategies or business drivers and struggle to meet defined services levels.	PWC's ICT services have explicit linkage to business strategies and business drivers. ICT services somewhat meet the defined service levels.	PWC's ICT services are integrated with capital planning & investment control and support e-government. ICT services meet defined service levels.	Capital planning and investment control are adjusted based on the feedback received and lessons learned. PWC periodically re-examines business drivers and aligns of ICT services.	ICT service metrics are used to optimise and drive business linkages. PWC business is involved in the continuous process improvement of ICT services.
3. Governance	No explicit governance of PWC's ICT management processes. The structure of ICT doesn't enable the organisation to fully utilise and govern its ICT environment. No view of ICT investments, risks, performance and business alignment.	Governance exists over a few of PWC's ICT management processes and some view of ICT investments, risks, performance and business alignment exists.	PWC has explicit documented governance for the majority of ICT management processes and has a view of ICT investments, risks, performance and business alignment.	PWC has explicit documented governance for the majority of ICT management processes and has a view of ICT investments, risks, performance and business alignment. Formal processes for managing variances feed back into governance model.	PWC has explicit documented governance for the majority of ICT management processes and has a view of ICT investments, risks, performance and business alignment. A standards and waivers process is used to improve governance-process improvements.

Appendix B. Current period projects

The following projects have been completed, intended to be started, or underway in the current period.

Table 6 Summary of current period projects

Project	Current Status	OMP Capability Uplift project link	Comments
ESRI Decoupling and Phased Upgrade	Completed	No link	Completed all stages of ESRI decoupling and upgrade. Note that we started earlier on the ESRI decoupling
Financial Improvement Project	Underway	Tranche 2 and 3 Physicals to Financials	Technical upgrade completed in July 2023. Remainder of project to be completed by 2028
Maximo Upgrade	Underway	Tranche 2 and 3 Physicals to Financials	Technical upgrade completed in November 22. Remainder of project Tranche 2-3 will remove customisations and map system functionality between Financial Management System (FMS) and Asset management System (MAXIMO)
RMS Upgrade	Underway	Tranche 1 Meter to Cash	Includes aspects of CRM and estimation and quotation System to be delivered in October 2023
Meter Data Management	Underway	Tranche 1 Meter to Cash	System to be delivered in October 2023
Data and Reporting Program	Completed	No link	
System Planning Tools	Not yet started	No link	DERMS, OMS, Operational Tech uplift
RIN Reporting	Completed	No link	
Mobility	Not started	Works management and work order dispatch Op model including operations hub	To be addressed in Tranche 2 and 3 of the Operating Model – Capability Uplift

Project	Current Status	OMP Capability Uplift project link	Comments
Investment Planning & Forecasting	Not yet started	Tranche 2 and 3 Physicals to Financials	To be addressed in Tranche 2 and 3 of the Operating Model – Capability Uplift
Outage Management System	Not yet started	No link	To be addressed with Operational Technology Uplift
Drawing Management System	Not yet started	No link	Review of the process has indicated that Power and Water would have to have an FTE re-assignment or increase to manage function
CATS & B2B System	Completed	Tranche 1 Meter to Cash	Delivered interim B2B in 2018. Market complaint system to be delivered in October 2023
CRM	Underway	Tranche 1 Meter to Cash	
Scheduling	Underway	Tranche 2 and 3	To be addressed in Wave 2 and 3 of the Operating Model – Capability Uplift
Project Management System / Smartsheet	Completed	No link	Enterprise Program Management System
Estimating & Quotation Management	Underway	Tranche 1 Meter to Cash	To be delivered through velocity October 2023
Operational Risk Reporting	Completed	Tranche 1 HRCE implementation	Completed
Hardware Replacement	Completed	No link	Delivered full program
Software Upgrades	Completed	No link	Delivered full program

Other comments:

- Energy Management System's (EMS) hardware upgrade in March 2022. The system is now on supported hardware in preparation for upgraded EMS software or an Operational Technology Uplift (OTU)

- Implementation of OSI Pi (a data management platform) to improve data collection from the electricity network, thereby improving the reliability of network data that we use to report to the Australian Energy Regulator (AER) in our Regulatory Information Notices (RINs).Additionally, the following projects were delivered:
  - Cyber security and business systems resilience project
  - TAPS – Enterprise Architecture Toolset
  - Integrated Communications (Telephone Upgrade) GENESYS
  - Government Data Centre Relocation
  - Distributed Antenna System for Ben Hammond complex (Power Services' main site)
  - Customer Connectivity (Orphan NMI Network mapping)
  - Solar Forecast management tool
  - APA Site relocation
  - Honeywell system and hardware upgrade
  - APA Site relocation
  - Honeywell system and hardware upgrade.