



# ICT Capital Expenditure Plan

## Power and Water Corporation

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# ICT Capital Expenditure Plan

## 1 Executive Summary

Power and Water Corporation (Power and Water) is proposing a total of \$35.808 million<sup>1</sup> of capital expenditure (capex) for information, communication and technology (ICT) for its first 5-year Regulatory Control Period (RCP1) under Australian Energy Regulator (AER) jurisdiction, commencing 1 July 2019. Power and Water is presenting a prudent capital program to deliver the key objectives of its electricity distribution business. The capital program is designed to provide ICT assets in a practical and efficient manner to ensure the ongoing reliability and security of supply to network customers.

This document describes and justifies Power and Water’s non-network, ICT forecast capital expenditure in RCP1 to efficiently meet the obligations of a Distribution Network Service Provider (DNSP) for the delivery of Standard Control Services. It also demonstrates how Power and Water’s ICT forecast capital expenditure meets the objectives, criteria and factors set out in the National Electricity Rules (NER).

Please note, that unless otherwise stated, the expenditure presented in this document is in real 2017/18 dollars. Also, many of Power and Water’s ICT projects/programs and associated ICT Capex cost are managed at an enterprise level for multiple business units. Unless otherwise indicated, all costs shown in this document have been adjusted to reflect only the portion allocated to Power and Water’s Power Networks business unit.

As required by Regulatory Information Notice (RIN) dated 9 November, 2017, Power and Water’s ICT forecast expenditure for RCP1 has been grouped into four categories as shown in the table below:

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Capital Expenditure Category	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
ICT Asset Extensions	\$ 1,539	\$ 950	\$ 225	\$ 0	\$ 0	\$ 2,713
ICT Asset Remediation	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
ICT Asset Replacement	\$ 5,204	\$ 6,792	\$ 3,930	\$ 1,554	\$ 2,009	\$ 19,489
ICT Capability Growth	\$ 3,613	\$ 1,321	\$ 2,862	\$ 3,074	\$ 2,736	\$ 13,606
<b>Total Expenditure</b>	<b>\$ 10,356</b>	<b>\$ 9,062</b>	<b>\$ 7,017</b>	<b>\$ 4,628</b>	<b>\$ 4,745</b>	<b>\$ 35,808</b>

As shown in the table above, \$19.489 million is forecast for ICT Asset Replacement projects which is about 54% of the overall expenditure. Power and Water implemented IBM’s Maximo Asset Management System in 2012 along with a geographic information system

<sup>1</sup> The forecast total capital expenditure included in this Expenditure Plan will differ slightly to Attachment ‘PWC12.7 - SCS and ACS Metering Capex Model - 31 Jan 18 – Confidential’ submitted to the Australian Energy Regulator. This is due to the rounding applied in Attachment PWC12.7.



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(ESRI ArcGIS) and a financial management system (Oracle). Power and Water’s enterprise systems for revenue management (Gentrack) was installed in 2002, upgrades were made in 2012.



From an historical perspective, total ICT Capex has ranged from \$2.4 to \$3.7 million (in 2017/18 dollars) with an average of \$2.9 million per year for the historical six-year period 2011/12 to 2016/17. Significant increases in ICT Capex to an average of \$4.1 million per year are forecast for 2017/18 and 2018/19 in preparation for major ICT asset replacement programs and implementation of enhanced ICT capabilities to comply with the new regulations. For comparison purposes, Power and Water’s ICT Capex forecast of \$35.808 million averages to just over \$7 million per year for the five year period 2019/20 to 2023/24, with the increase primarily due to major ICT projects to upgrade or replace core enterprise systems.

Another way to look at the proposed ICT Capex is by business area. The proposed ICT Capex will cover five major business areas:

- Network Operations
- Remediate the Core
- ICT Applications & Infrastructure Refresh
- Customer Service
- Enterprise

The following table categorises the forecast ICT Capex by business area:

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

Business Area	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Network Operations	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Remediate the Core	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
ICT Application & Infrastructure Refresh	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Customer Service	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enterprise	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>Total Expenditure</b>	<b>\$ 10,356</b>	<b>\$ 9,062</b>	<b>\$ 7,017</b>	<b>\$ 4,628</b>	<b>\$ 4,745</b>	<b>\$ 35,808</b>

A brief description of the ICT programs contained in each business area is provided below:

## Network Operations



# ICT Capital Expenditure Plan

- Network Planning – to provide reliable and timely data for network demand forecasts in enabling effective, prudent and reliable network planning functions.
- Works Management – to implement a system to effectively manage and plan field workforce including: Investment Planning & Forecasting, Work Scheduling, Mobility and Project Management.
- Outage Management – to implement an industry standard Outage Management System to support network operations, responses and reporting on faults, incidents and outages. Additionally, the system will improve Power and Water’s capability to manage communications with electricity consumers and customers in relation to planned and unplanned outage events.
- Network Business Management – to improve the effectiveness of the network business in Estimating and Quotation Management, Fleet Management, Operational Risk Reporting, Drawing Management and Interpretation of Power and Water’s Enterprise Business Agreement (EBA).
- Systems Operations – to implement a system to enable Power and Water to deliver the market operations to facilitate retail competition, appropriate to the size of the Northern Territory market.
- RINs – to implement a business intelligence (BI) tool to enable Power and Water to collect and collate network business data for RINs reporting to the AER, as a regulatory compliance requirement.

## Remediate the Core

- Revenue Management System – Upgrade of network billing system to maintain within vendor support parameters in line with industry practices, reduces operation risks of a core network function, to facilitate billing of network tariff options.
- Financial Management System – Upgrade of core financial system to support efficient financial management functions.
- Maximo and ESRI Upgrade – [REDACTED]

## ICT Application & Infrastructure Refresh

- Enterprise Application Refresh – Periodic refresh of enterprise applications, in line with industry practices to enable efficient network business functions and prudent application licences management.

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- Enterprise Infrastructure Refresh – Periodic refresh of enterprise infrastructures, in line with industry practices to reduce the risk of operations failure and interruptions due to ageing infrastructures.

## Customer Service

- Customer Relationship Management - to implement a Customer Relationship Management (CRM) system to provide functionality to better manage electricity consumer expectations as a DNSP.
- Meter Data Management – to implement system and processes required to provide customer benefits of improved metering data, in complying with the Northern Territory specific elements of the NER requirements (Chapter 7a).

## Enterprise

- Data and Reporting Program – to implement a set of business intelligence data and reporting tools to improve the reliability of enterprise data and reporting function capability for the distribution network business.

Further details on Power and Water’s ICT Expenditure Plan, how it aligns to Power and Water’s corporate goals, how Power and Water governs ICT Capex, Power and Water’s forecasting methodology, and a comparison to historical spend on ICT are contained within the body of this document.



# ICT Capital Expenditure Plan

## 2 Introduction

### 2.1 Purpose

This document describes and justifies Power and Water Corporation's (Power and Water's) non-network, information, communication and technology (ICT) forecast capital expenditure for Standard Control Services in its first 5-year Regulatory Control Period (RCP1) under Australian Energy Regulator (AER) jurisdiction, commencing 1 July 2019. It also demonstrates how Power and Water's ICT forecast capital expenditure meets the objectives, criteria and factors set out in the National Electricity Rules (NER).

We have forecasted a non-network ICT capital expenditure of \$35.808 million to deliver a prudent program to provide the required ICT assets to achieve the objectives and obligations as a distribution network services provider (DNSP) in the efficient delivery of reliable, secure and sustainable supply of network services to all stakeholders.

Please note, that unless otherwise stated, the expenditure presented in this document is in real 2017/18 dollars. Also, many of Power and Water's ICT projects/programs, and associated ICT Capex costs, are managed at an enterprise level for multiple business units. Unless otherwise indicated, all costs shown in this document have been adjusted to reflect only the portion allocated to Power and Water's Power Networks business unit.

In accordance with the Regulatory Information Notice (RIN) dated 9 November, 2017, Power and Water has grouped non-network ICT capital expenditure into the required four categories listed below with definitions extracted from Appendix F of the RIN:

ICT Capital Expenditure Category	Definition from Appendix F, RIN dated 9 November, 2017
ICT asset extensions	The extension of existing ICT assets to broaden its functionality.
ICT asset remediation	The correction or optimisation of the performance of existing ICT assets that are not performing to the required service performance requirement.
ICT asset replacement	The replacement of an existing ICT asset with its modern equivalent where the asset has reached the end of its economic life. This Capex has a primary driver of replacement if the factor determining the expenditure is the existing ICT asset has an inability to efficiently maintain its service performance requirement.
ICT capability growth	The acquisition, development and implementation of new ICT assets to meet a business purpose or capacity requirement.



# ICT Capital Expenditure Plan

The breakdown of the proposed non-network ICT capital expenditure over RCP1 in the AER’s expenditure categories is summarised as follows:

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Capital Expenditure Category	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
ICT Asset Extensions	\$ 1,539	\$ 950	\$ 225	\$ 0	\$ 0	\$ 2,713
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The proposed programs of work are consistent with the strategic directions and objectives set out in Power and Water’s ICT Strategy and aligns to Power and Water’s corporate vision and goals.

## 2.2 Scope

The scope of this document includes the capital expenditure for enterprise-wide and Power Networks business unit specific ICT assets and excludes capital expenditure relating to operational technology assets, such as SCADA and Network Control.

## 2.3 Structure

This document is structured as follows:

- Section 3 describes the investment context including:
  - an extract of Power and Water’s corporate goals together with an overview of how the ICT Expenditure Plan aligns to these goals;
  - a description of ICT historical spend; and
  - a comparison of historical ICT spend to the forecasted expenditure for RCP1.
- Section 4 provides an overview of Power and Water’s ICT Governance model.
- Section 5 summarises the forecasting methodology used to derive the information, communication and technology capital expenditure forecast.

# ICT Capital Expenditure Plan



- Section 6 details the proposed information, communication and technology programs of work, the capital expenditure forecasts and their justifications for the regulatory control period.
- Section 7 lists the supporting documentation.





## 3 Investment Context

Power and Water is established under the Power and Water Corporation Act 2002 and is a Northern Territory Government Owned Corporation (GOC) under the Government Owned Corporations Act 2001. Power and Water provides electricity, water and sewerage services to four major regional areas in the Northern Territory, including the capital city of Darwin, as well as 72 remote Indigenous communities and 66 outstations.

Power and Water operated as a vertically and horizontally integrated multi-utilities business until 1 July 2014 when the contestable retail and generation businesses were separated out of Power and Water and formed two new GOC's - Jacana Energy (retail) and Territory Generation. Power and Water retains electricity networks, remote operations, system and market operator functions, gas purchasing, water and sewerage. Although all three GOCs have been operating since 2014, Power and Water continues to provide some services to Jacana Energy through service level agreements.

In accordance with the Government Owned Corporations Act 2001, Power and Water's objectives are to:

- operate at least as efficiently as any comparable business, and to
- maximise the sustainable return to the Northern Territory Government on its investment in the corporation.

### 3.1 Power and Water Corporate Vision and Goals

In its Statement of Corporate Intent (SCI) 2017/2018, Power and Water identified its corporate vision and its corporate goals as follows:

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*Our vision is to be a best practice, commercially focused and customer centric multi-utility respected by the community for its contribution to the Northern Territory economy and its pursuit of the long-term interests of consumers.*

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### Power and Water Corporate Goals

Key Result Areas	Goals
<b>Health and Safety</b>	A proactive safety culture across the corporation based on accountability, trust and ethical behaviour.
<b>People and Culture</b>	A high performing, diverse workforce that has the capability to drive business effectiveness.
<b>Financial Performance</b>	A financially robust and commercially sustainable organisation with a strong capital discipline framework and delivering appropriate returns to our shareholders.



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<b>Operational Performance</b>	An efficient provider of services supported by strong asset management, governance and protection of the environment.
<b>Customer</b>	A customer centric organisation achieving the respect and trust of all our customers and stakeholders across all parts of the business in delivering our services.

## 3.2 Alignment of ICT Expenditure Plan to Corporate Goals

Power and Water is structured along five lines of business supported by centralised business services:



- Power Networks
- System Control
- Regions & Remote Operations
- Gas Supply
- Water Services
- Business Services

Power Networks is the largest business unit in Power and Water, with responsibility for planning, building and maintaining reliable electricity networks to transmit electricity between electricity generators and electricity consumers in the Northern Territory.

For purposes of this regulatory submission, corporate goals and associated ICT requirements for the Regions & Remote Operations, Gas Supply, and Water Services lines of business have been excluded.

In order to implement the corporate goals listed in the SCI, Power and Water’s Power Networks, System Control and Business Services business lines identified their key strategies and initiatives. The following items require ICT involvement and / or support.

### Excerpt of Power Networks Key Strategies and Initiatives requiring ICT Support:

**PN1** - Preparation for the transition to the new regulatory regime – including developing internal capability, stakeholder engagement and initiatives to support the new commercial and regulatory environment.

**PN2** - Preparation for the next Distribution Determination – for the regulatory control period 2019 to 2024 under the jurisdiction of the AER, including the implementation of sustainable improvements to the operating cost structure and capital investment efficiency.



## ICT Capital Expenditure Plan

**PN3** - Developing capability to respond to 'disruptive' technologies and meet future customer requirements – including actively engaging with customers and facilitating energy solutions such as smart meters and advanced energy management and power quality systems.

**PN4** - Implementation of the Metering Strategy – including a meter data management system solution to improve efficiency and cost effectiveness of the metering business and take advantage of smart metering technology to reduce operational costs and estimated meter reads.

### **Excerpt of System Control Key Strategies and Initiatives requiring ICT Support:**

**SC1** - Implementation of the Northern Territory Electricity Market (NTEM) - including developing and implementing appropriate processes, procedures, systems and contracts to support market commencement as the independent Market Operator and Power System Controller.

**SC2** - Ensuring the security and reliability of the power systems - including the implementation of an outage management system to improve quality and reliability of supply and timely information about interruptions to our customers.

### **Excerpt of Business Services Key Strategies and Initiatives requiring ICT Support:**

**BS1** - Remediate the core systems to modify our processes and core systems to remove unnecessary complexity and to improve business efficiency, customer support, decision support and asset management whilst improving the total cost of ownership in ICT investments.

**BS2** - Enhance the customer experience by establishing a customer centric operating model within the Customer Service Centre that can be nurtured throughout Power and Water, along with the implementation of a first call resolution strategy, leveraging a digital engagement platform to better understand and serve our customers, and strengthening Power and Water's brand in the community.

**BS3** - Drive improvement in organisational strategic planning including our reporting framework and planning capability.

**BS4** - Identify improvements to core financial systems including budget and consolidation models for better planning and decision support.

The table below identifies the applicable ICT program in the expenditure plan that addresses each of these corporate goals:

# ICT Capital Expenditure Plan



Corporate Goal	ICT Program(s)
<p>PN1 Preparation for the transition to the new regulatory regime – including developing internal capability, stakeholder engagement and initiatives to support the new commercial and regulatory environment.</p>	<p><b>Network Operations - RIN Reporting</b> <b>System Operations</b></p>
<p>PN2 Preparation for the next Distribution Determination – for the regulatory control period 2019 to 2024 under the jurisdiction of the AER, including the implementation of sustainable improvements to the operating cost structure and capital investment efficiency.</p>	<p><b>Network Operations - Works Management</b> <b>Network Operations – Network Business Management</b> <b>Network Operations - RIN Reporting</b></p>
<p>PN3 Developing capability to respond to ‘disruptive’ technologies and meet future customer requirements – including actively engaging with customers and facilitating energy solutions such as smart meters and advanced energy management and power quality systems.</p>	<p><b>Network Operations - Network Planning</b> <b>Network Operations - Works Management</b> <b>System Operations</b></p>
<p>PN4 Implementation of the Metering Strategy – including a meter data management system solution to improve efficiency and cost effectiveness of the metering business and take advantage of smart metering technology to reduce operational costs and estimated meter reads.</p>	<p><b>Customer Service - Meter Data Management</b></p>
<p>SC1 Implementation of the Northern Territory Electricity Market (NTEM) - including developing and implementing appropriate processes, procedures, systems and contracts to support market commencement as the independent Market Operator and Power System Controller.</p>	<p><b>Network Operations - System Operations</b></p>
<p>SC2 Ensuring the security and reliability of the power systems - including the implementation of an outage management system to improve quality and reliability of supply and timely information about interruptions to our customers.</p>	<p><b>Network Operations - Outage Management</b></p>
<p>BS1 Remediate the core systems to modify our processes and core systems to remove unnecessary complexity and to improve business efficiency, customer support,</p>	<p><b>Remediate the Core ICT Application &amp;</b></p>

# ICT Capital Expenditure Plan



Corporate Goal	ICT Program(s)
decision support and asset management whilst improving the total cost of ownership in ICT investments. This includes upgrading out-of-support systems, retiring legacy systems, establishing data as an enterprise asset, seamless integration of enterprise systems and leveraging the enterprise core.	<b>Infrastructure Refresh</b>
BS2 Enhance the customer experience by establishing a customer centric operating model within the Customer Service Centre that can be nurtured throughout Power and Water, along with the implementation of a first call resolution strategy, leveraging a digital engagement platform to better understand and serve our customers, and strengthening Power and Water’s brand in the community.	<b>Customer Service - Customer Relationship Management</b>  <b>Network Operations</b>
BS3 Drive improvement in organisational strategic planning including our reporting framework and planning capability.	<b>Enterprise - Data and Reporting Program</b>
BS4 Identify improvements to core financial systems including budget and consolidation models for better planning and decision support.	<b>Remediate the Core</b>

### 3.3 ICT Historical Spend

As a GOC, Power and Water is notionally independent of the Northern Territory Government, however it is required to be cognisant of, and where necessary comply with the policies, standards and guidelines that apply to all ICT systems design, development and operation across Northern Territory Government Agencies. The need for compliance with the Northern Territory Government’s ICT-related policy requirements has significant implications for the current and future evolution of ICT at Power and Water.

The Business Systems and Information Management Branch (BSIM) provide a ‘centralised service’ of ICT for Power and Water, focusing on support and enhancement for business applications, architecture, system design and operational management. Many of its services (and resources) are provided through outsourcing contracts either at a whole of Northern Territory Government level (e.g. desktop and help desk services) or directly managed by Power and Water (e.g. Oracle systems support).

Field operations of Power and Water are largely paper-based and delivered predominantly via manual processes. The field workforce is equipped with limited automated toolkits especially in the deployment of mobility solutions and in the take-up of emerging



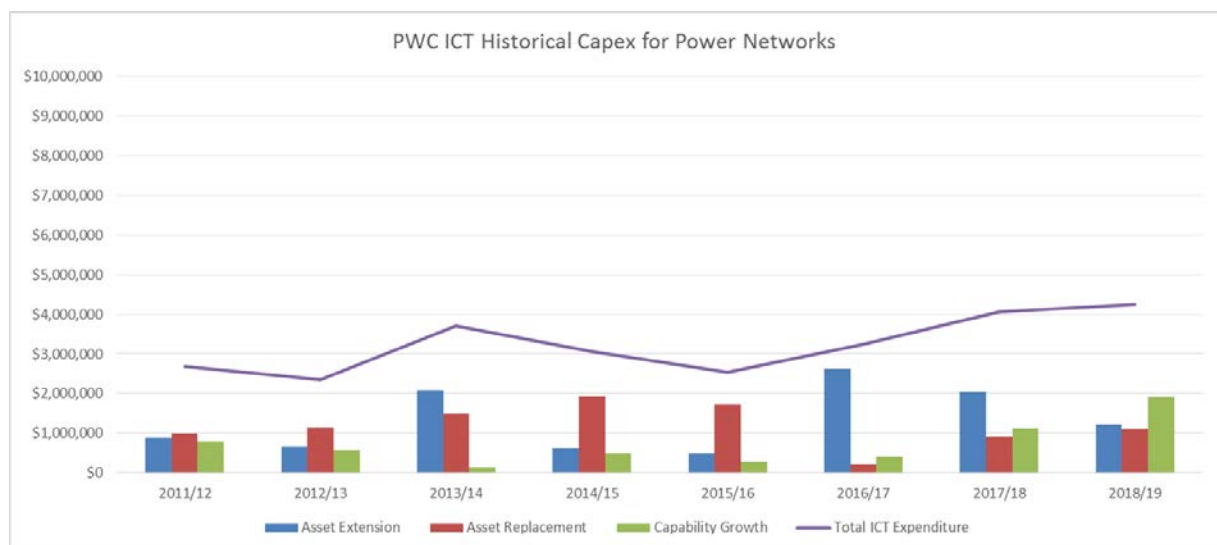
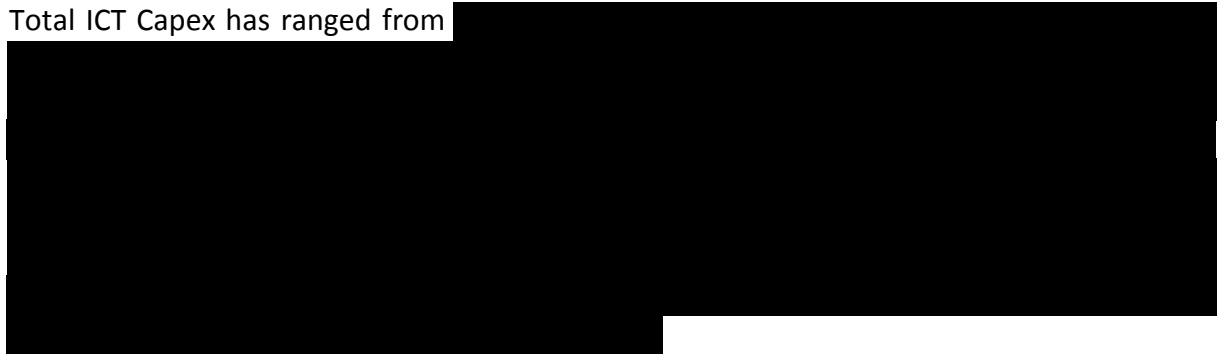
## ICT Capital Expenditure Plan

technologies when compared with other Australian and international utilities. As a result, access in the field to data, data quality, and data timeliness are being compromised and (field-based) data collection, aggregation and dissemination is a time consuming process involving both back office and front office activities.

Due to the diversity of the multi-utility business model each of Power and Water's business units have both 'enterprise' and 'business unit specific' technology requirements. Significant synergies and economies of scale have been realised by identifying and applying the principle of 'common problems requiring common solutions' to ICT investment decision making.



Total ICT Capex has ranged from



(Note: All amounts are in 2017/18 real dollars)



# ICT Capital Expenditure Plan

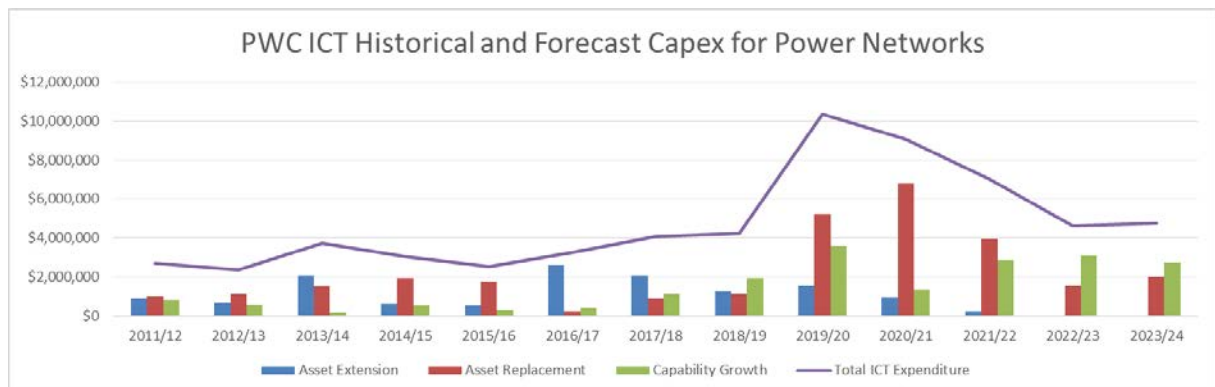
Year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Asset Extension	\$893,053	\$652,894	\$2,074,141	\$617,382	\$503,303	\$2,627,702	\$2,040,104	\$1,236,427
Asset Replacement	\$1,000,174	\$1,132,702	\$1,488,401	\$1,940,238	\$1,735,620	\$217,132	\$910,460	\$1,109,974
Capability Growth	\$796,990	\$573,731	\$150,671	\$494,748	\$295,731	\$402,088	\$1,116,596	\$1,910,842
Total ICT Expenditure	\$2,690,216	\$2,359,327	\$3,713,213	\$3,052,369	\$2,534,654	\$3,246,921	\$4,067,160	\$4,257,242

### 3.4 Planned vs. Historical ICT Expenditure

Power and Water has forecast a non-network ICT capital expenditure of \$35.808 million for the five year period 2019/20 to 2023/24 (RCP1). The breakdown of this expenditure is \$2.713 million for ICT Asset Extension projects, \$19.489 million for ICT Asset Replacement projects and \$13.606 million for ICT Capability Growth projects. Based on these forecasts, about 54% of ICT’s forecasted spend is for ICT Asset Replacement projects.



As shown by the following chart, to implement these ICT Asset Replacement projects, Power and Water is forecasting a significant increase in ICT Capex for the three years 2019/20, 2020/21, and 2021/22 as compared to Power and Water’s historical spend on ICT Capex:



Following these ICT Asset Replacement programs, ICT Capex is forecast to return to close to pre-2019/20 expenditure of less than \$5 million per year (in real 2017/18 dollars).

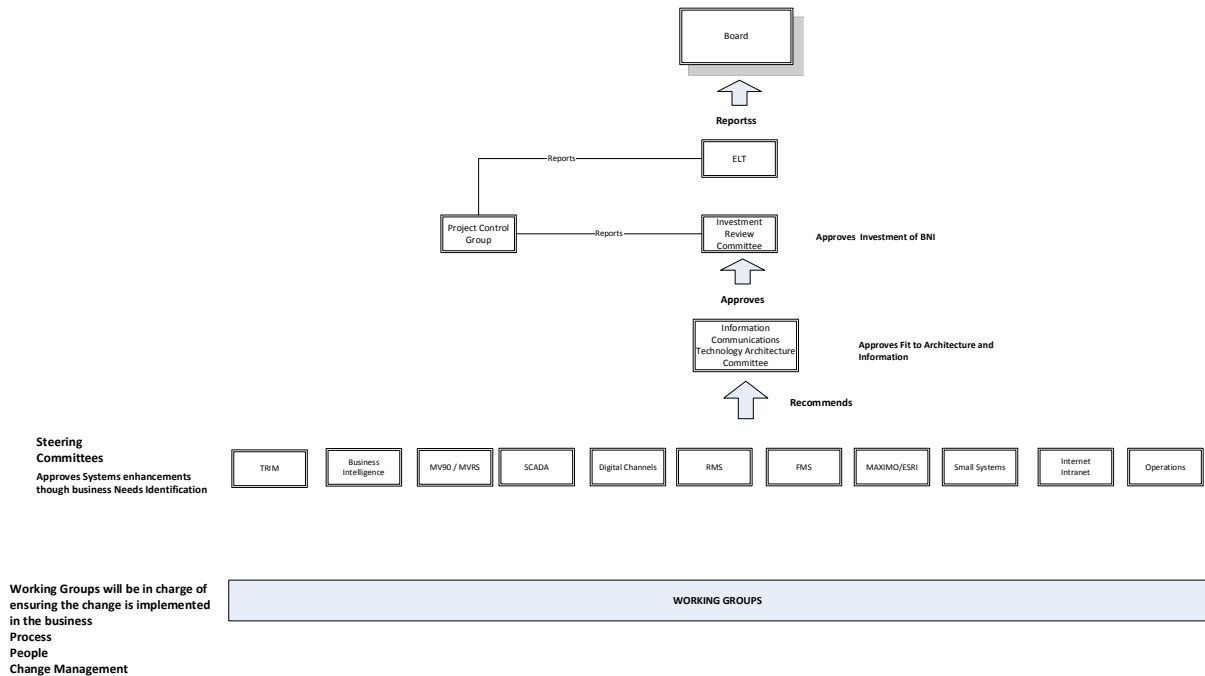




# ICT Capital Expenditure Plan

## 4 ICT Governance

The following diagram describes the overall governance framework for ICT expenditure at Power and Water:



The purpose and the delegation / authorities of each of the committee in the governance framework diagram are summarised in the table below:

Committee	Purpose	Delegations / Authorities
Investment Review Committee (IRC)	<ul style="list-style-type: none"> <li>Business case review and approval</li> </ul>	<ul style="list-style-type: none"> <li>Approve projects above \$250,000</li> <li>Approve projects with a multi business unit impact</li> </ul>
Information Communication Technology Architecture Committee (ICTAC)	<ul style="list-style-type: none"> <li>Standards, principles and implementation governance</li> </ul>	<ul style="list-style-type: none"> <li>Approve projects under \$250,000</li> <li>Approve ICT solutions in line with architecture and information standards</li> <li>Ensure funding from business unit for required capital and operational investment is understood and secured</li> </ul>
Program Control Group (PCG)	<ul style="list-style-type: none"> <li>Program/Project monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Review progress of projects</li> <li>Approve change request for projects</li> <li>Escalate/ approve actions form project steering committees</li> </ul>
Project Management	<ul style="list-style-type: none"> <li>Program Reporting and</li> </ul>	<ul style="list-style-type: none"> <li>Provide reporting mechanism for IRC and PCG on project progress , expenditure and risk</li> </ul>





# ICT Capital Expenditure Plan

Committee	Purpose	Delegations / Authorities
Office (PMO)	Monitoring	
Business System Owners and ICT Steering Committees	<ul style="list-style-type: none"><li>• Drive system requirements to enable process and efficiencies</li></ul>	<ul style="list-style-type: none"><li>• Approve system enhancements and changes in line with ICT principles</li><li>• Priorities system enhancements and initiatives</li></ul>
Program and / Projects Teams / Working Groups	<ul style="list-style-type: none"><li>• System development and delivery</li></ul>	<ul style="list-style-type: none"><li>• Define business requirements</li><li>• Deliver process enhancements from ICT investment</li><li>• SME's advice on projects</li></ul>

Through the governance framework and structure, prudent management decisions on ICT expenditures and priorities are actioned in accordance with Power and Water's ICT Strategy and various business strategies and business unit plans.

Power and Water has adopted a series of guiding principles for ICT Architecture which are used as the basis for prudent management decision-making on proposed ICT expenditures:

- **Maximize Benefit to the Enterprise** – Information management decisions are made to provide maximum benefit to Power and Water as a whole.
- **Simplify Before Automation** – Power and Water will simplify, rationalize and consolidate business process 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** – In general, Power and Water will implement applications that can be used across the enterprise rather than applications which will be provided to only a particular part of the business.
- **Total Cost of Ownership** – Consideration of all costs associated with a system over its entire life span results in more cost effective planning and decision-making processes.
- **Business Responsibility for Business Outcomes** – Business units are responsible to achieve planned business outcomes from information systems that are delivered in accordance with their business needs and requirements.

Further details are provided in the Power and Water ICT Strategy.



# ICT Capital Expenditure Plan

## 5 Forecasting Methodology

### 5.1 Overview

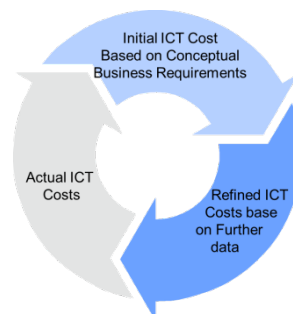
Power and Water submitted a document titled 'Expenditure Forecasting Methods for Electricity Distribution Services' to the AER in May 2017. Cost estimates in this submission have been prepared based on the methods described in that document.

In general, Power and Water uses four different approaches (Scoped Capex, Programmed Capex, Pooled Capex, and Benchmarked Capex) to forecast expenditure. Only three of these approaches are used by ICT. A brief description of the three approaches used by ICT is provided below:

- Scoped Capex -- Capex will be forecast by scoping and costing individual projects.
- Programmed Capex -- Capex will be forecast based on programs of work for different asset classes. Forecasts will be based on a build-up of volumes and unit costs. Power and Water uses a variety of techniques to forecast both volumes and unit costs, depending on the asset class.
- Pooled Capex -- Capex will be forecast at an aggregate level, typically based on either a single historical year or a historical trend. Power and Water may use this approach where scoped or programmed capex forecasts cannot readily be prepared.

### 5.2 ICT Asset Extensions

Power and Water used the scoped capex method to develop the expenditure forecast for each of the ICT programs categorised as ICT asset extensions. As described in the diagram below, these initial capex expenditure forecasts are based on conceptual business requirements and feedback from previous, similar ICT projects / programs. As the ICT project / program proceeds and better data is available, the expenditure forecast will be refined and updated through the various project life-cycle stages.



Power and Water uses a five-stage project life-cycle. The stages are Investment Planning, Project Development, Commitment, Delivery, and Review. The following table indicates for each ICT program classified as ICT Asset Extension the stage at which cost forecasts have been developed and included in Power and Water's ICT Expenditure Plan:



# ICT Capital Expenditure Plan

ICT Asset Extension Programs		
Section	ICT Program Name	
6.2.3	Network Planning	
6.2.8	RIN's	
6.6.3	BI Data & Reporting	

## 5.3 ICT Asset Remediation

Not Applicable

## 5.4 ICT Asset Replacement

ICT applications generally require regular upgrades to remain within vendor support parameters as well as to take advantage of improved capabilities. Likewise, ICT hardware must be regularly refreshed to remain current and supportable.

Power and Water used a combination of the Scoped Capex method (described in Section 5.1 and 5.2 above) and the Programmed Capex method to develop the expenditure forecast for each of the ICT programs categorised as ICT asset replacement.

For those forecasts that utilised the Programmed Capex method, costs were based on a build-up of volumes and unit costs as described below:

- Volume forecasts were based on:
  - assets and applications reaching the end of their technical life, having regard for their age and condition,
  - asset obsolescence and vendor support,
  - prescribing a set number of units for replacement each year (for example, to address a low-consequence risk that requires mitigation but does not warrant the immediate replacement of the entire asset family), or
  - historical asset replacement volumes.
- Unit rates were based on:
  - Power and Water's historical costs,
  - costing models, or



# ICT Capital Expenditure Plan

- cost estimates from external independent consultants or service providers.

Where volume and / or unit rates were not available, Power and Water used the Pooled Capex approach and based the forecast expenditure on historical capex only.

The following table indicates for each ICT program classified as ICT Asset Replacement the stage at which cost forecasts have been developed and included in Power and Water’s ICT Expenditure Plan:

ICT Asset Replacement Programs		
Section	ICT Program Name	
6.3.3	Revenue Management System	
6.3.4	Financial Management System	
6.3.5	Maximo and ESRI Upgrade / Reimplementation	
6.4.3	Enterprise Application Refresh	
6.4.4	Enterprise Infrastructure Refresh	

## 5.5 ICT Capability Growth

Power and Water used the Scoped Capex method to develop the expenditure forecast for each of the ICT programs categorised as ICT Capability Growth. As described in Sections 5.1 and 5.2 above, these initial capex expenditure forecasts are based on conceptual business requirements and feedback from previous, similar ICT projects / programs.

The following table indicates for each ICT program classified as ICT Capability Growth the stage at which cost forecasts have been developed and included in Power and Water’s ICT Expenditure Plan:

# ICT Capital Expenditure Plan



ICT Capability Growth Programs		
Section	ICT Program Name	
6.2.4	Works Management	
6.2.5	Outage Management	
6.2.6	Network Business Management	
6.2.7	System Operations	
6.5.3	Customer Relationship Management	
6.5.4	Meter Data Management	



# ICT Capital Expenditure Plan

## 6 ICT Capital Expenditure Plan

### 6.1 Overview

Planned ICT Expenditure by Category by Year is provided in the table below:

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Capital Expenditure Category	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
ICT Asset Extensions	\$ 1,539	\$ 950	\$ 225	\$ 0	\$ 0	\$ 2,713
ICT Asset Remediation	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
ICT Asset Replacement	\$ 5,204	\$ 6,792	\$ 3,930	\$ 1,554	\$ 2,009	\$ 19,489
ICT Capability Growth	\$ 3,613	\$ 1,321	\$ 2,862	\$ 3,074	\$ 2,736	\$ 13,606
<b>Total Expenditure</b>	<b>\$ 10,356</b>	<b>\$ 9,062</b>	<b>\$ 7,017</b>	<b>\$ 4,628</b>	<b>\$ 4,745</b>	<b>\$ 35,808</b>

The ICT Expenditure has also been categorised by business area as shown in the table below:

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

Business Area	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Network Operations	████████	████████	████████	████████	████████	████████
Remediate the Core	████████	████████	████████	████████	████████	████████
ICT Application & Infrastructure Refresh	████████	████████	████████	████████	████████	████████
Customer Service	████████	████████	████████	████████	████████	████████
Enterprise	████████	████████	████████	████████	████████	████████
<b>Total Expenditure</b>	<b>\$ 10,356</b>	<b>\$ 9,062</b>	<b>\$ 7,017</b>	<b>\$ 4,628</b>	<b>\$ 4,745</b>	<b>\$ 35,808</b>

The following sections provide an overview of the ICT programs by business area.

### 6.2 Network Operations

Power Networks is responsible for providing the standard and alternative control services for Power and Water’s sub-transmission and distribution networks in the Northern Territory. Coverage of service areas are primarily to Darwin, Katherine, Tennant Creek and Alice Springs.



# ICT Capital Expenditure Plan

## 6.2.1 Business Context

Power and Water has proposed a set of ICT expenditure programs, in line with the industry and its outlined key strategies to actively seeking opportunities to deliver the network services efficiently to energy consumers, through appropriate technologies, prudent management and costs.

Power and Water’s focus on continuous improvement will ensure that we provide network services through efficient processes that can be updated, streamlined or automated. Many of these improvement opportunities will be enhanced through the use of industry technology solutions.

## 6.2.2 ICT Enabling Initiatives

ICT Program	Year 1	Year 2	Year 3	Year 4	Year 5	RCP
	2019/20	2020/21	2021/22	2022/23	2023/24	Total
Network Planning	██████	██████	██████	██████	██████	██████
Works Management	██████	██████	██████	██████	██████	██████
Outage Management	██████	██████	██████	██████	██████	██████
Network Business Management	██████	██████	██████	██████	██████	██████
System Operations	██████	██████	██████	██████	██████	██████
RIN’s	██████	██████	██████	██████	██████	██████
<b>Total Expenditure – Network Operations</b>	<b>\$ 3,016</b>	<b>\$ 1,259</b>	<b>\$ 2,862</b>	<b>\$ 2,231</b>	<b>\$ 1,893</b>	<b>\$ 11,261</b>

## 6.2.3 Network Planning

### 6.2.3.1 Project Summary

The proposed expenditure will enhance Power and Water’s system planning tools by providing reliable and timely generation, consumption, forecast and network data. It will do this by integrating key existing ICT applications to enable modelling of distribution systems utilisation and creation of appropriate forecasts of future network demands, for prudent and timely network replacement and augmentation planning.

### 6.2.3.2 Business Need

Power and Water has experienced a large increase in the rate of connection of embedded generation (solar panels, mainly) to the network which has introduced network management issues and could potentially lead to power system stability issues. Disruptive technologies, such as the availability of cheap energy storage (batteries), is expected to further change network usage patterns in the future. Power and Water’s current network



# ICT Capital Expenditure Plan

models are inadequate to model these changes, and can't be reconfigured quickly enough to accommodate the rapidly changing nature of the electricity distribution industry.

Power and Water needs the capability to:

- Accurately model the distribution system with timely load and generation data, to determine spare capacity and augmentation requirements,
- Identify supply problem areas in advance, and
- Explore opportunities for localised demand management through identification of supply demand and distribution feeder profiling.
- Future capability should be able to model the following:
  - Residential level modelling to include photo-voltaic and electric vehicle systems,
  - Commercial developments, and
  - Subdivision developments.

### 6.2.3.3 Options Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Avoid capital spend.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• May adversely impact on network performance and ability to meet customer expectations due to:               <ul style="list-style-type: none"> <li>• slow connections because profiles and capacities of the local distribution networks cannot be effectively analysed,</li> <li>• quality of supply from incorrect technical operating parameters imposed on connected generators and loads, and</li> <li>• inability to enable connection of new technology or demand management options.</li> </ul> </li> </ul>
<b>Option 2 – Continue to enhance System Planning tools</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Enables Power and Water to accurately model the distribution system with both demand and generation to determine network utilisation, capacity planning, network replacement and augmentation requirements.</li> <li>• Allows Power and Water to:               <ul style="list-style-type: none"> <li>• Improve efficiency and reliability of its network capacity</li> </ul> </li> </ul>



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Option	Comments
	<p>planning process,</p> <ul style="list-style-type: none"> <li>• Support its network expenditure planning with timely and appropriate modelling data and tools,</li> <li>• Enable consideration and provision of appropriate non-network options over network expenditures, and</li> <li>• Align with industry capability to analyse for localised demand management through identification of demand and distribution feeder profiling.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Full utilisation of capabilities will only occur after implementation of the meter data management and distribution management systems.</li> </ul>

## 6.2.3.4 Preferred Option

Option 2 is preferred. This project is to take forward the existing work and continue to enhance Power and Water’s system planning tools and capability in line with the technological development of the electricity distribution industry.

### 6.2.3.4.1 Scope for Preferred Option

The project is a continuation of work that has already commenced prior to RCP1; Power and Water has already completed the GIS connection to Sincal (load flow analyser). The following items are included in the scope of work for the remainder of this project to be completed during the RCP:

- Data cleansing,
- New data collection (may require GIS/Maximo database modification),
- Integration with interval meter data to inform decision for new and replacement smart meters in line with policy,
- Integration of Sincal with customer load and generation data:
  - Possible consumption and generation kWh from the Meter Data Management System,
  - Possible estimated annual consumption and size of generator,
- Verification and optimisation of the network modelling system,
- Integration with DMS,
- Implementation of new hardware as required
- All required testing activities, and
- Training and change management.

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## 6.2.3.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• The proposed expenditure will enable Power and Water to efficiently provide reliable demand forecasts to support appropriate network capacity planning.</li> <li>• Additionally to support the expected demand increase for non-network solutions (PV), an increase in the use of electric vehicles within the Northern Territory and the subsequent impact in the power usage profiles.</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• The proposed expenditure will provide Power and Water the enabling technology to support the Northern Territory Government's adopted commitment of 50 percent renewable energy by 2030.</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services;</b> or</p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of</b></p>	<ul style="list-style-type: none"> <li>• The proposed expenditure seeks to enhance the current network modelling tools and data to support more effective management of the distribution network system, providing data that will drive improved prudent network capacity planning, utilisation and risk management in the near-term to ensure reliability and quality of supply of standard control services, and longer-term forecasting supporting the enduring security of the supply. Specifically this system will treat risks of network from related disruptive and emerging technologies.</li> <li>• Additionally, the proposed system will enable Power and Water to improve its network alternative analysis in network replacement and augmentation capacity planning.</li> </ul>



# ICT Capital Expenditure Plan

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

<p><b>standard control services.</b></p>	
<p><b>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</b></p>	<ul style="list-style-type: none"> <li>Improved understanding of the system operation will drive a pro-active approach to network operational risk and safety.</li> </ul>

## 6.2.3.4.3 Mapping to AER Capital Expenditure Criteria

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

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>The preferred option focuses on reducing current workarounds and manual processing to support network analysis. The approach intends to cost effectively implement a solution that leverages existing Business Intelligence and Sincal platforms.</li> </ul>
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>The proposed expenditure and the understanding of the scale of the project has been developed through a pilot project which was based on interfacing GIS with Sincal (load flow analyser).</li> <li>Costs of the preferred option are comparable to realistic upgrade projects implemented in industry and are based on Power and Water's experience with these systems.</li> </ul>

## 6.2.3.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:



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Tangible benefits	Intangible benefits
<ul style="list-style-type: none"><li>• Optimised planning will reduce long term network capital expenditure and therefore contribute to lower increases in the tariff.</li><li>• Will allow existing staff to spend their time and effort to undertake analysis work, rather than spending time on data extraction and manually intensive data verification.</li><li>• Enhanced ability to identify causes of voltage issues across the network, and therefore reduce number of persistent crew call-outs. This has an estimated saving of \$200k p.a., however, this could be an underestimation.</li></ul>	<ul style="list-style-type: none"><li>• Through the ability to identify emerging issues and identify high demand, the system will support pro-active risk management, compared to current reactive processes.</li><li>• Support enhanced forecasting across Power and Water through improved data to make prioritisation decisions.</li><li>• The system will support Power and Water compliance with RIN reporting through improving the maturity and detail of the data available; the system will provide information down to customer level, while currently it can only provide to zone sub-station/feeder level.</li><li>• Reduce the risk of new technologies, such as increased up-take of electric cars across the Northern Territory, allowing for an understanding of the impact and provide input into network planning.</li><li>• Support the Northern Territory Government target for 50% renewables by 2050.</li><li>• Increased customer satisfaction through improved response to customer requests for infrastructure changes, such as the introduction of a larger scale solar solution.</li><li>• Enhanced staff engagement as staff will not need to perform low-level tasks.</li></ul>

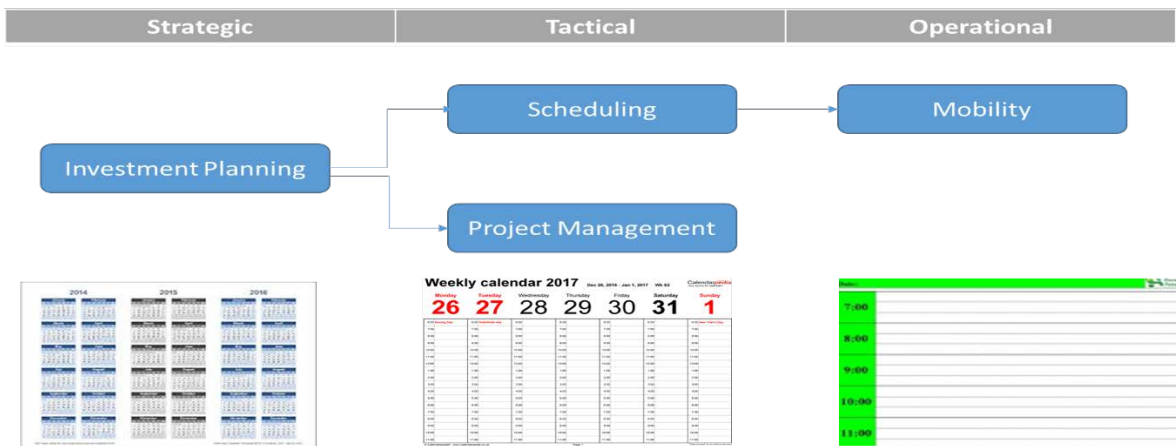
## 6.2.4 Works Management

### 6.2.4.1 Project Summary

This program comprises four streams of work, mainly related to improving efficiency of the field workforce (see figure below). The first stream of work focusses on overall network investment planning and forecasting. Stream two addresses using ICT solutions to improve scheduling of work, while the third stream focusses on improving access to ICT systems in the field, in particular the enterprise asset management system. The fourth stream of work addresses implementing an ICT solution for project management activities.



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Spectrum of Works Management Projects

Please note that the timing for implementation of this program is heavily dependent on availability of resources, both internal and external, and will need to be coordinated with several large ICT Programs such as Remediate the Core. For purposes of this document, we have assumed that implementation will occur in the later part of RCP1.

## 6.2.4.2 Business Need

### Stream 1: Investment Planning & Forecasting:

Investment planning and forecasting seeks to reduce the total cost of ownership of the revenue earning asset (i.e. the network) without incurring unacceptable risk, generally by trying to extend the life of existing assets, and optimising the cost of replacement. Currently these functions are performed manually. This project will analyse, select and implement a technology solution or solutions to assist the current functions.

### Stream 2: Scheduling:

Power and Water's implementation of Maximo provides limited functionality to schedule resources. Once an activity, or resource, is scheduled, the application does not provide a means to re-allocate labour efficiently for changes in priority, or in the event of urgent situations. Current processes build an initial schedule and then track compliance, however, this process results in sub-optimal decision-making as the metrics do not support the most effective way of working. Power and Water needs the ability to re-allocate labour to high cost/risk jobs as part of a dynamic resourcing and dispatch process.

### Stream 3: Mobility:

Currently, Power and Water uses electronic forms to collect basic asset information in the field which is then uploaded to Maximo using middleware. Like most utilities, Power and Water is seeking to provide real-time data to its field workforce from its Enterprise Asset Management system (EAM) and to update the EAM directly as work is completed in the field. There is a need for a technical solution that will support Power and Water to achieve



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enhanced mobility work practices resulting in a more efficient and effective deployment and re-deployment of resources. This project will be enabled through improved scheduling.

## Stream 4: Project Management:

Power and Water currently manages projects using multiple paper-based and Microsoft-based tools. Power and Water has identified potential productivity improvements from standardising project management tools. Current manual intensive reporting processes for project and program progress has limited ability to support governance across the portfolio of activities. Specifically, improved reporting of project progress and the whole-of-life costs across the portfolio requires improvement. Implementation of an effective enterprise project management tool would address the business need. No preferred technical solution has been identified at this time, however, Power and Water is currently building skills in MS Project.

### 6.2.4.3 Options Analysis

Option	Comments
<b>Stream 1 – Investment Planning and Forecasting</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Avoid capital spend.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Delay Power and Water’s ability to enhance network investment planning processes and deliver potential cost savings.</li> </ul>
<b>Option 2 – Implement New System</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Option will replace the manual processes.</li> <li>• Improved ability to communicate investment planning across Power and Water.</li> <li>• Enables Power and Water to improve the investment planning processes and drive prudent investment decisions, priorities and efficiencies.</li> </ul> <p>Improve the quality and reliability of network information to support investment governance in improved visibility to the Executive on the focus of investments.</p> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• <u>Upfront capital investment,</u></li> <li>• Disruption to current processes, and</li> <li>• Training will be required to effectively use the system.</li> </ul>
<b>Stream 2 – Scheduling</b>	

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Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Avoid capital spend.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Continuing with current manual process will likely extend labour allocation inefficiencies to related network and emergency operations, with impact on delivery of quality and reliability of network services.</li> <li>• Potential increase in network operating expenditures on additional Power and Water business processes to compensate for inefficiencies due to work scheduling.</li> <li>• Opportunity loss to improve processes and deliver efficiencies.</li> </ul>
<b>Option 2 – Implement New System</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• System will significantly improve the ability to allocate and re-allocate resources onto the priority tasks, while providing visibility of resource capabilities and their commitments.</li> <li>• Supports the achievement of the Operational Performance strategic goal.</li> <li>• System will support the delivery of benefits to the Mobility project through providing improved visibility of resources and their priorities.</li> <li>• System will provide Power and Water with capability to improve network supply performance.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• <u>Upfront capital investment,</u></li> <li>• Implementation of the system will require significant changes to current processes.</li> </ul>
<b>Stream 3 – Mobility</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Avoid capital spend.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Power and Water will retain outdated processes and significantly reduce the ability to implement modern operational practices as used by peer Distribution Network Service Providers.</li> <li>• Likely increase in operating expenditures as manual processes</li> </ul>

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Option	Comments
	will be introduced to compensate for the current lag time in updating ICT systems.
<b>Option 2 – Implement New System</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Deliver a key enabler to drive efficiencies in operational performance, specifically this will support improvements in asset management processes.</li> <li>• Support the introduction of working practices to retain parity with other peer DNSPs.</li> <li>• Align Power and Water’s network operations in line with industry using mobility operational technology.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• <u>Upfront capital investment, and</u></li> <li>• Significant changes to processes across all elements of the field crew’s processes and practices.</li> </ul>
<b>Stream 4 – Project Management</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Avoid capital spend.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Loss of ability to address the issues relating to the limited use of technical project management solutions.</li> <li>• Likely increase in operating expenditures with businesses or manual processes to align and integrate projects planning and reporting into a single and consistent view.</li> <li>• Likely to impact investment governance, due to the lack of transparent and consistent management view to enable programs progress alignments and dependencies.</li> </ul>
<b>Option 2 – Implement New System</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• The system will support the reduction in inefficient manual processes, in particular the manually intensive reporting processes.</li> <li>• Consolidating work into a central project/program management system will increase the quality of the data which will therefore increase business and regulator confidence in reports on the delivery of the Works Program.</li> <li>• Improved quality and reliability of investment data to support prudent management decisions and governance.</li> </ul>



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Option	Comments
	<p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• <u>Upfront capital investment, and</u></li> <li>• Change management impact with staff training to effectively use the system.</li> </ul>

## 6.2.4.4 Preferred Option

The preferred options for each of the projects are as follows:

### Stream 1: Investment Planning & Forecasting:

The preferred option is for the implementation of a new system that will reduce manual processes and improve communication of the investment plan across Power and Water.

### Stream 2: Scheduling:

Option 2 is preferred. This project will implement a new system that will provide dynamic scheduling.

### Stream 3: Mobility:

The preferred option is for the implementation of a new system that will drive efficiencies in operational performance.

### Stream 4: Project Management:

The preferred option is to implement a new system that will improve processes and provide Power and Water with improved reporting across the portfolio of work.

## 6.2.4.4.1 Scope for Preferred Option

### Stream 1: Investment Planning & Forecasting:

Power and Water has commenced needs analysis for this investment based on using available off-the-shelf software in meeting their needs in accordance with strategic principles for IT and not to custom develop an IT solution. Therefore, the scope of work will include:

- Review and analyse available technology options, and conduct appropriate tender activities,
- Conduct readiness assessment and the required preparatory activities,
- Implement the new software solution,
- Implement new hardware if required,



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- Migrate existing investment and forecasting data,
- Testing, and
- Train users and conduct change management activities.

## Stream 2: Scheduling:

Power and Water has done a preliminary investment of potential software solutions and has identified several that may meet their requirements. Maximo provides add-on tools such as Maximo Asset Management Scheduler that may be suitable. In addition, software from Prometheus also appears to meet many of Power and Water's needs. As in Stream 1 above, Power and Water intends to procure a software solution rather than develop a customised tool for scheduling. The scope of work will include:

- Review and analyse available technology options,
- Conduct readiness assessment and the required preparatory activities,
- Implement the new software solution,
- Implement new hardware if required,
- Migrate existing scheduling data,
- Testing, and
- Train users and conduct change management activities.

## Stream 3: Mobility:

The mobility solution will need to be coordinated closely with the scheduling solution in Stream 2. IBM Maximo Anywhere will likely be the preferred solution, especially if the Maximo Asset Management Scheduler tool is selected for Stream 2. Again, Power and Water believes that off-the-shelf software is available to meet their needs and that they will not need to custom develop an IT solution. Therefore, the scope of work will include:

- Review and analyse available technology options,
- Conduct readiness assessment and the required preparatory activities,
- Implement the new software solution,
- Implement new hardware if required,
- Migrate relevant data,
- Testing, and
- Train users and conduct change management activities.

## Stream 4: Project Management:

Potential solutions for Project Management software include Smart Sheets, Microsoft Project and Primavera. The following activities are included in the scope of work for this project:

- Assess various technology options,
- Conduct readiness assessment and the required preparatory activities,
- Implement new software,



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- Implement new hardware if required,
- Testing, and Training and Change Management.

## 6.2.4.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services;</b> or</p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of</b></p>	<ul style="list-style-type: none"> <li>• The proposed expenditure seeks to introduce a suite of works management projects that will improve the efficiencies in the delivery of standard control services through improved maintenance regime of Power and Water assets required to deliver services, improved ability to respond to service issues through more efficient process leading to faster response times and ability to make more effective local decisions.</li> </ul>



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

<p><b>standard control services.</b></p>	
<p><b>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</b></p>	<ul style="list-style-type: none"> <li>The proposed option will deliver improved safety through enhanced communication, timely availability of network assets data, field resources and spatial capabilities.</li> </ul>

## 6.2.4.4.3 Mapping to AER Capital Expenditure Criteria

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

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>The preferred option focuses on delivering specific solutions to address gaps in Power and Water capabilities in-line with industry and enable efficient and optimal operations of Power and Water's network assets.</li> </ul>
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>The preferred options have been costed to realistic timelines and scope. Where possible, modules of existing Power and Water applications will be used to minimise the change elements of the projects.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>The projects have been scheduled to begin after the major asset management and finance projects have been conducted to ensure that Power and Water has the suitable resources and understanding to effectively implement.</li> <li>Costs of the preferred option are comparable to realistic upgrade projects implemented in industry, based on Power and Water's experience with these systems and Power and Water will ensure competitive market costs through procurement management.</li> </ul>

## 6.2.4.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

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Tangible benefits	Intangible benefits
<p><u>Stream 1: Investment Planning &amp; Forecasting:</u></p> <ul style="list-style-type: none"> <li>Improved ability to forecast the works to avoid failures and defects will reduce costs for urgent works and reallocation of resources.</li> </ul>	<p><u>Stream 1: Investment Planning &amp; Forecasting:</u></p> <ul style="list-style-type: none"> <li>The project will address the guidance from the Asset Management Customer Value (AMCV) Project Report 2016 stating that the number one priority area for improvement in Power and Water is Renewal Forecasting, and number four being Asset Risk, Performance Assessment and Renewal Planning.</li> <li>The ability to strategically plan asset management tasks will provide balanced capital and maintenance costs based on maintaining network levels of service and risk exposure level.</li> <li>Increase operational efficiency as will allow for better forecasting of resources.</li> <li>Improved ability to prioritise the future works will support ability to identify opportunities to delay capital expenditure to the most effective delivery point across the portfolio.</li> <li>The enhanced understanding of the forecast of works out to seven years will support efficient delivery of future AER submissions.</li> <li>The project will support Power and Water management with structured investment forecasts and planning as part of the prudent investment decision and management functions.</li> </ul>
<p><u>Stream 2: Scheduling:</u></p> <ul style="list-style-type: none"> <li>Increased productivity of internal workforce by enabling increased work volumes to be undertaken internally, therefore reducing the extent of market spend.</li> <li>Improved ability to focus resources on preventative maintenance, rather than corrective maintenance estimated to deliver a 3% reduction in overall</li> </ul>	<p><u>Stream 2: Scheduling:</u></p> <ul style="list-style-type: none"> <li>Will support increased efficiency of work performed on the network during an outage resulting in decreased outage duration and enhanced customer satisfaction.</li> <li>Will reduce the number of faults through effective maintenance leading to improved customer satisfaction.</li> <li>Improved workforce satisfaction as less</li> </ul>

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Tangible benefits	Intangible benefits
<p>corrective maintenance estimated at \$300,000 p.a.</p> <ul style="list-style-type: none"> <li>Reduction in unplanned (out of hours, urgent) maintenance due to optimised prioritisation process estimated at a saving of \$288,000 p.a.</li> </ul>	<p>urgent and reactive jobs.</p> <ul style="list-style-type: none"> <li>Improved efficiencies and productivity in the workforce will avoid potential need for increase in workforce.</li> </ul>
<p><u>Stream 3: Mobility:</u></p> <ul style="list-style-type: none"> <li>Efficiencies for crews returning to depot as ability to dispatch effectively remotely estimated at an efficiency of 0.87FTE resulting in an efficiency saving of \$124,667 p.a.</li> </ul>	<p><u>Stream 3: Mobility:</u></p> <ul style="list-style-type: none"> <li>Enable Power and Water a mobility technology platform in line with industry development and as a foundation to mobile field work management and mobile network asset management.</li> <li>Improved safety through improved communication, reporting and spatial technology.</li> <li>Improved decision making in the field due to improved access of field crews to key information.</li> <li>With the introduction of field dispatch the need for crew leads to attend the office is significantly reduced allowing them to provide more time in supervision resulting in improvements in safety, quality and productivity.</li> <li>Increase of overall field crew efficiency will allow for increased number of jobs conducted with the same pool of staff.</li> <li>Timeliness of asset data updates and improvement to asset data accuracy drives effective and efficient business decision-making.</li> <li>Reduction in delays in business reporting, reduces the risk of inconsistent data in reports across the Enterprise.</li> <li>Provision of up-to-date customer and environmental information to the field reduce the risks of incidents and improves customer relationships.</li> </ul>

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Tangible benefits	Intangible benefits
<p><b><u>Stream 4: Project Management:</u></b></p> <ul style="list-style-type: none"> <li>• Improved processes to conduct effective P3O activities is estimated to deliver a 0.3 FTE efficiency saving estimated at \$42,636 p.a.</li> <li>• Enhanced and more automated reporting processes to support better governance estimated at a 0.1 FTE efficiency saving estimated at \$14,212 p.a.</li> </ul>	<p><b><u>Stream 4: Project Management:</u></b></p> <ul style="list-style-type: none"> <li>• Introduction of a centralised planning view provides a single view of work demand enabling more effective resource planning.</li> <li>• Provide the ability to build synergies across the utilities of Power and Water and provide opportunities for future efficiencies.</li> <li>• Improved resource allocation across Power and Water, in particular key skills for SCADA, leading to a reduction in need for external contractor support.</li> <li>• System will provide whole of life costs across the portfolio to support better overall planning.</li> <li>• Enforces prudent investment governance practices through reductions in project cost over-runs, better understanding of available resources, ability to monitor project expenditure and improve planning activities for projects with inter-dependencies.</li> </ul>

## 6.2.5 Outage Management

### 6.2.5.1 Project Summary

Power and Water has identified a need for an Outage Management System (**OMS**) to support their response to faults, incidents and outages which will allow for a greater degree of efficiency in fault location and repair, effectively improving performance in relation to system interruptions. Additionally, the system will improve Power and Water’s capability to manage communications with electricity consumers and customers in relation to planned and unplanned outage events.

### 6.2.5.2 Business Need

Section 24 of the Utilities Commission Act – empowers the Utilities Commission (UC) to create and maintain jurisdictional codes. The UC has created the Electricity Industry Performance (EIP) Code, which specifies the minimum service performance and record keeping standards, network reliability performance indicators. Power and Water is required to comply with the requirements of the Code.



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Power and Water currently captures outage information required for EIP Code and asset performance reporting using manual processes. The state of the HV distribution network is tracked using static wall boards and shift logs. The customers impacted by outage and asset performance reports are manually correlated from shift logs. Due to these processes being manual, there are issues with the reliability of the reporting and the time taken to input the information in Maximo.

Near real-time recording of the HV distribution network's state and customer outage information is necessary to improve the reliability and efficiency of these reports to both minimise Guaranteed Service Level payments and permit an accurate analysis of the reliability of the Network. This will result in the most efficient use of funding to achieve network reliability improvements. The OMS will enable Power and Water's capability to meet existing and future regulatory reporting and compliance requirements.

The OMS will enable the migration of the static wall boards to a computer based system with active displays of the HV and LV distribution network geo spatially and the HV schematically, that records and electronically displays the time based state of the network. In addition, the OMS has an application that links the customer information to the distribution feeder and to each individual substation. Hence, near real-time reports for the EIP Code and asset performance can be produced efficiently after an outage, and based on near real-time data of the outage and its restoration.

The OMS has a suite of applications that will improve the work efficiencies of System Controllers by eliminating the need to maintain the state of assets on the wall boards and detailed hand written logs. The switching component will facilitate the creation of switching sheets (PRI's) with preparation and restoration instructions for unplanned and planned works.

### 6.2.5.3 Options Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• Reduces or delays capital expenditure.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Power and Water lags industry practices in using manual processes to co-ordinate and report the remediation of its network outages. Continual reliance on manual process will not likely meet network performance reporting requirements in accordance with the new national regulatory framework.</li><li>• Currently, when a call is received concerning a fault, incident or issue it is logged in the Power and Water Asset Management system for reference. Power and Water System Control then refers to the Asset Management system and calls the relevant crew to attend. As the Asset Management system does not</li></ul>





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Option	Comments
	<p>prompt the controllers, incidents can be missed.</p> <ul style="list-style-type: none"><li>• Power and Water System Control needs to place numerous radio and phone calls to 'on call' operators to have them attend to network faults.</li></ul>
<b>Option 2 – Implement an OMS</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• The implementation of an OMS aligns Power and Water with good industry practices for outage management.</li><li>• Following a robust procurement process, Power and Water selected a preferred vendor's OMS. The preferred OMS:<ul style="list-style-type: none"><li>• Supports the safety standards at Power and Water by providing incident tracking and outage prediction,</li><li>• Allows for minimal truck rolls due to the prediction engine grouping calls for no power into one outage; controllers are therefore able to dispatch to the single location rather than to a series of individual address locations.</li><li>• Provides full reporting functions to allow Power and Water to report correct and accurate outage figures on SAIDI and SAIFI to the Regulator every month.</li><li>• Proven vendor industry solution for network outage management.</li></ul></li><li>• Power and Water to implement a 'vanilla' solution and avoid additional customisation expenditure.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Requires ICT capital expenditure.</li></ul>

## 6.2.5.4 Preferred Option

The preferred option is for the implementation of an OMS. Please note that substantial project work will have begun prior to RCP1.

### 6.2.5.4.1 Scope for Preferred Option

The OMS is a commercial and industry proven, off-the-shelf system provided by Hexagon Safety and Infrastructure. As part of the implementation project, the OMS is being integrated with existing Power and Water systems and will make use of virtualisation tools to help reduce hardware costs. The OMS will provide the following functionality:

- Network's Outage Management,
- Switching Operations Management,
- Mobile Faults capabilities,



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- Corporate Web Browser for,
  - real-time state of the Networks,
  - Reporting,
- Specified standard reports and end user configured reports, and
- Historical Data.

To perform the above tasks the OMS will be interfaced with the following systems:

- GIS (ESRI),
- Billing systems (RMS),
- Metering systems, and
- Asset management systems (Maximo).

Power and Water’s power networks will be configured in the OMS and displayed in the GIS. Additional Hardware is required to implement the OMS, however, where practical Power and Water is using virtualisation software to reduce spend on new equipment and cabling.

Additionally, the project scope is to include the following project management activities:

- Conduct readiness assessment and the required preparatory activities,
- Implement the new software solution,
- Implement new hardware,
- Migrate relevant data,
- Testing, and
- Train users and conduct change management activities.

### 6.2.5.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• The preferred option will enable Power and Water with existing and future compliance with regulations such as the EIP Code (Utilities Commission Act – Section 24) by supporting accurate analysis of the reliability of the Network.</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or</b></p>	<ul style="list-style-type: none"> <li>• The preferred option will provide enhanced time based data of outages and support the efficient treatment of the issue to ensure that supplies interruptions are minimised as part of Power and</li> </ul>

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

<p><b>requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services; or</b></p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</b></p>	<p>Water's standard control services. Further, the accurate reporting of the outage data will allow more effective post-incident analysis, than current static manual processes, to absorb the lessons to improve current practices, and ability to mine historical data to find common causes, asset components reliabilities, failures and damages.</p>
<p><b>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</b></p>	<ul style="list-style-type: none"> <li>• The preferred option will enhanced the operational information available to Power and Water's staff in greater clarity on network switching and energisation, thus provides the capability to maintain the safety of the distribution system through the supply of standard control services.</li> <li>• Additionally, improving the quality of Power and Water's communications to the energy users, customers and the public on planned and unplanned outage events, through safe consumption and delivery of standard control services.</li> </ul>



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## 6.2.5.4.3 Mapping to AER Capital Expenditure Criteria

### Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules)

*The forecasted capital expenditure reasonably reflects each of the following:*

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>The planned project will deliver a system that will reduce manual management processes, such as the use of static wall board process, and increase the reliability and efficiency of incident and outage data to reduce the time and effort to manage and implement a resolution.</li> </ul>
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>The proposed solution has been developed after an extensive Expression of Interest and selection process in which market leading OMS providers were assessed. The use of a Hexagon solution is in line with OMS used by peer DNSPs.</li> <li>Additionally, the implementation of the solution will not include system customisation in ensuring the lowest cost solution will be implemented.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>The solution implementation will begin prior to the major core remediation activities, therefore, minimising competition for resources.</li> </ul>

## 6.2.5.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<ul style="list-style-type: none"> <li>Greatly improved accuracy and reliability in SAIDI and SAIFI regulatory reporting,</li> <li>Greater accuracy in customer time off supply (Partial Restorations),</li> <li>Enhanced response for 'Critical' customers e.g. Life Support,</li> <li>Greater accuracies in customer incident numbers reported,</li> <li>Capture urgent and non-urgent follow up repair work,</li> <li>Less truck rolls sending crews to individual incidents,</li> </ul>	<ul style="list-style-type: none"> <li>Management of planned and unplanned switching,</li> <li>Improving communications to energy users, customers and the public on planned and unplanned outage events, in continuing to ensure safety Greatly improved reliability using historical records,</li> <li>Asset management relating to reliability,</li> <li>Ability to identify and manage potential network risk,</li> <li>All customer calls will be taken and</li> </ul>



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Tangible benefits	Intangible benefits
<ul style="list-style-type: none"><li>• Improved Power and Water's performance in interruption duration through improved efficiency in response time,</li><li>• Less time waste in location of fault, and</li><li>• Reduce annual GSL payment.</li></ul>	<p>recorded,</p> <ul style="list-style-type: none"><li>• Eliminate reliance on static wall boards, and</li><li>• Bringing Power and Water in line to industry practices with an OMS.</li></ul>

## 6.2.6 Network Business Management

### 6.2.6.1 Project Summary

This program comprises five streams of work, mainly related to improving the overall business management of the power networks business. The five streams of work are:

- Estimating and Quotation Management,
- Fleet Management,
- Operational Risk Reporting,
- Drawing Management System, and
- Enterprise Business Agreement (EBA) Interpreter.

Please note that the timing for implementation of this program is heavily dependent on availability of resources, both internal and external, and will need to be coordinated with several large ICT Programs such as Remediate the Core. For purposes of this document, we have assumed that implementation will occur in the later part of RCP1.

### 6.2.6.2 Business Need

#### Stream 1 – Estimating and Quotation Management

Power and Water conduct a manual process for the estimation and quotation of network business service requests. Consultation with key users of the current system has identified that there is a loss of opportunity to improve processes to provide consistent quotations. In particular, current processes for development of quotations rely heavily on key resource experience. Development of robust processes would be supported by the introduction of a specific estimating and quotation management tool to standardise the costs of network services.

#### Stream 2 – Fleet Management

Power and Water currently utilises a whole-of-Northern Territory Government process for fleet management. Consultation with key staff has identified potential efficiencies in the current system relating to the utilisation and the turnover of the fleet. To enable moving the



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fleet management function to Power and Water, a tool will be required to perform the activities at a local level.

## Stream 3 – Operational Risk Reporting

Currently Power and Water does not have a fully effective system to manage the identification and collection of risks and the subsequent automated workflows to ensure a clear accountability trail. Further, the ability to record ‘lessons learnt’ and share them across the Corporation is curtailed by the current manual processes. An operational risk management system will support effective risk management across the spectrum of risk and support the escalation of risk to the appropriate management level.

Power and Water’s 2017-2018 SCI states that a Key Result Area is Health and Safety. Power and Water is to have a ‘proactive safety culture across the corporation based on accountability, trust and ethical behaviour’. The achievement of this will be specifically supported with the implementation of an operational risk management system.

## Stream 4 – Drawing Management System

Drawing management is currently conducted using TRIM - HP Record Manager. Power and Water requires a drawing management system with features and functions that will support effective editing, version control and storage of the technical drawings, as well as support the provision and viewing of drawings in mobile field work environments. Power and Water’s current system could be improved to more effectively support mobile working processes (see Mobility Project).

## Stream 5 – EBA Interpreter

Power and Water has a complex EBA which includes many entitlements and clauses. This complexity leads to a significant impost to personnel management. Power and Water has identified an opportunity to introduce a system to support cultural change and awareness of the EBA which will identify issues earlier and ensure better compliance.

### 6.2.6.3 Options Analysis

Option	Comments
<b>Stream 1 – Estimating and Quotation Management</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• No capital expenditure, and</li> <li>• No disruption to current practices – maintain current output.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• No treatment for the Power and Water key resource risk, and</li> </ul>



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Option	Comments
<p><b>Option 2 – Implement a New System</b></p>	<ul style="list-style-type: none"> <li>• Loss of opportunity to improve risk management procedures.</li> </ul> <p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Improved consistency and reliability of estimations for network services requests across Power and Water,</li> <li>• Improved ability to develop a mature system that captures internal estimation data, provide the ability to improve costs, and align with competitive market offerings,</li> <li>• Reduction in the manual process for producing and tracking quotations,</li> <li>• Enhanced visibility of the released quotations will improve management and resource allocation, and</li> <li>• Improved reporting ability on estimation and quotation activities, supporting analysis of overall performance.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Ongoing maintenance of the technical system, and</li> <li>• Disruption to current practices caused by transition to a new system and potential employee change resistance.</li> </ul>
<p><b>Stream 2 – Fleet Management</b></p>	
<p><b>Option 1 – Do Nothing</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• No capital expenditure.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Inefficiencies in the current processes will endure, and</li> <li>• Reduced ability to bring fleet management activities in-house.</li> </ul>
<p><b>Option 2 – Implement a New System</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• An effective fleet management system will facilitate the movement of fleet management activities in-house, from the current whole-of Northern Territory Government solutions,</li> <li>• Cost savings from improved fleet management, specifically, improved efficiency, and</li> <li>• Improved visibility for Power and Water to manage the use of vehicles and better allocation of the resource.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Capital outlay,</li> </ul>

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Option	Comments
	<ul style="list-style-type: none"> <li>• Benefits will only be realised as part of a wider transition of the fleet management activities to Power and Water, and</li> <li>• Increased management burden for Power and Water once fleet management tasks brought in-house with a possible increase in opex.</li> </ul>
<b>Stream 3 – Operational Risk Management</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• No capital expenditure, and</li> <li>• No disruption to current practices – maintain current output.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• No treatment for the key resource risk, and</li> <li>• Loss of opportunity to improve risk management procedures.</li> </ul>
<b>Option 2 – Upgrade</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Ability to develop efficient processes for risk management that will support the delivery of strategic goals,</li> <li>• System will support increased accountability at all levels through providing a visible risk management trail and automated escalation of risks,</li> <li>• Improved visibility of risks at all levels will support risk trend analysis and subsequent implementation of treatments, and</li> <li>• Improved safety risk management, supporting the overall reduction in safety incidents.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Capital expenditure and ongoing system management cost, and</li> <li>• Achievement of the full benefits will require significant cultural change activities.</li> </ul>
<b>Stream 4 – Drawing Management System</b>	
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Reduced capital expenditure, and</li> <li>• No disruption to current processes.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Opportunity loss to implement a systems that could significantly improve drawing management procedures, and</li> </ul>



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Option	Comments
<p><b>Option 2 – Upgrade</b></p>	<ul style="list-style-type: none"> <li>Processes will continue to not be aligned with industry practice.</li> </ul> <p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Introduction of a system which will meet parity with industry standards,</li> <li>Provide the system to improve and enhance the processes for drawing management, delivering effective processes to reduce time for making edits, accessing required drawings and reduced drawing duplication,</li> <li>System implementation activities to include a review of current drawings held by Power and Water and removal of duplications, and</li> <li>Support the achievement of the Mobility Project benefits through improved ability to find and distribute drawings remotely.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Training of staff and change of processes will require commitment from all stakeholders.</li> </ul>
<p><b>Stream 5 – Enterprise Business Agreement</b></p>	
<p><b>Option 1 – Do Nothing</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>No capital expenditure.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Opportunity loss to make significant efficiency savings.</li> </ul>
<p><b>Option 2 – Implement a New System</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Support cultural change to deliver an EBA aware organisation which is expected to deliver significant cost savings,</li> <li>Improved transparency of the EBA for staff and subsequent reduction in HR burden to manage errors, and</li> <li>System will automate communication with staff when completing timesheets, and therefore support reduction of communications on EBA procedures and entitlements.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>System will require maintenance to remain effective as EBA changes are made, and</li> <li>Any errors in the system could significantly impact confidence in the system; accuracy is paramount.</li> </ul>



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## 6.2.6.4 Preferred Option

The preferred options for each of the projects are as follows:

### Stream 1 – Estimating and Quotation Management

The preferred option is for the implementation of a new system that will reduce manual process and facilitate improved maturity of estimation and quotation management.

### Stream 2 – Fleet Management

Option 2 is the preferred option. This option will support the improved management of the fleet and deliver improved efficiencies.

### Stream 3 – Operational Risk Reporting

The preferred option is the implementation of an operational risk reporting system to increase visibility of operational risk and drive accountability.

### Stream 4 – Drawing Management System

The preferred option is for the implementation of a dedicated drawing management solution to address current shortfalls in the capability.

### Stream 5 – EBA Interpreter

Option 2 is preferred. This option is the implementation of an EBA Interpreter that will support greater visibility and understanding of the EBA.

#### 6.2.6.4.1 Scope for Preferred Option

This program consists of five streams of work:

#### Stream 1: Estimating and Quotation Management:

While a preferred solution has not been identified, it is assessed that an off-the-shelf solution will meet the needs of Power and Water. It has not been identified if an on premise or cloud based solution is preferred. The solution will require collation and validation of the current data used for estimation activities prior to this being integrated into the solution. The solution will also require ability for Power and Water to make changes to the base data as required. Therefore, the scope of work will include:

- Review and analyse available technology options,
- Request tenders for the solution and assess offerings,
- Collation and validation of the estimation data,
- Implement and test solution, and
- Train users and conduct change management activities.



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## Stream 2: Fleet Management:

Initial development of the requirements is in-flight. The project will require transition of current out-sourced activities to be brought back into Power and Water to achieve the desired benefits. Therefore the project will include significant non-technical activities to support the final solution. The scope of work will include:

- Review and analyse available technology options,
- Request tenders for the solution and assess offerings,
- Migrate existing fleet data,
- Implement and test solution, and
- Train users and conduct change management activities.

## Stream 3: Operational Risk Reporting:

Initial assessments indicate a solution similar to the PROMAP Risk and Compliance module would be suitable. The technology solution will be augmented with process mapping and changes to current risk management procedures to facilitate benefits delivery; this work is to be included within the scope of the project. The scope of work is to include:

- Review and analyse available technology options (in-flight),
- Request tenders for the solution and assess offerings,
- Conduct relevant work to develop the desired risk management reporting processes,
- Implement and test solution, and
- Train users and conduct change management activities.

## Stream 4: Drawing Management System:

Initial investigations have suggested tools similar to RedEye Drawing Management System may be suitable to meet the requirements of Power and Water. It is assessed that the implementation should also include a review of the documentation currently held by Power and Water to reduce duplications and incorrect versioning. The project will only include Power and Water specific drawings at this stage. The outline scope of work will include:

- Review and analyse available technology options (in-flight),
- Request tenders for the solution and assess offerings,
- Review/cleanse of current drawings,
- Develop desired drawing management processes,
- Implement and test solution, and
- Train users and conduct change management activities.

## Stream 5: EBA Interpreter:

The preferred solution has not been identified at this time, however, there are several off-the-shelf solutions that could meet the needs of Power and Water. Development will require significant work to build the solution with significant software configuration activities. There



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are no significant technical dependencies, however, the development of the solution is dependent on any significant review of the EBA. Therefore, the scope of work will include:

- Review and analyse available technology options,
- Request tenders for the solution and assess offerings,
- Development of the solution to reflect the Power and Water EBA,
- Implement and test solution, and
- Train users and conduct change management activities.

## 6.2.6.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services;</b> or</p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control</b></p>	<ul style="list-style-type: none"> <li>• The suite of systems to be delivered will enable Power and Water to improve risk management and resource management processes in a timely and cost efficient manner. Effective risk management will underpin the reliability and quality of the standard control services. Other business applications, such as the drawing management system, will reduce the likelihood of errors within technical drawings, and thus the likelihood of an incident that will impact supply of services.</li> <li>• Indirectly, the quality of services will be maintained through the cost effective and efficient use of resources, which the suite of projects will enable.</li> </ul>



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

<p>services; and</p> <p>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</p>	
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> <li>Enhanced risk management will provide Power and Water with the visibility to prioritise activities with the required resources to ensure the safety of the distribution system.</li> </ul>

## 6.2.6.4.3 Mapping to AER Capital Expenditure Criteria

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

<p>6.5.7(c)(1) <i>the efficient costs of achieving the capital expenditure objectives;</i></p>	<ul style="list-style-type: none"> <li>The preferred option focuses on delivering efficiencies and process improvements to key business functions. Each of the systems will ensure that use of resources is optimised and assist in identifying the true performance indicators.</li> </ul>
<p>6.5.7(c)(2) <i>the costs that a prudent operator would require to achieve the capital expenditure objectives; and</i></p>	<ul style="list-style-type: none"> <li>The project options will deliver lean solutions to Power and Water to support the business functions.</li> <li>The benefits analysis, of both the tangible and intangible benefits, is assessed to offer the most value of the options considered.</li> <li>Each capital expenditure will be assess through Power and Water's investment criteria, including business cases in accordance with prudent governance and expenditure management.</li> </ul>
<p>6.5.7(c)(3) <i>a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</i></p>	<ul style="list-style-type: none"> <li>Costs of the preferred option have been estimated to provide lean solutions to reflect the small size of Power and Water in comparison to the larger customer base of competitors.</li> <li>Cost of project to be confirmed at implementation, to ensure competitive market pricing, in accordance with Power and Water's procurement requirements.</li> </ul>



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## 6.2.6.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<p><u>Stream 1: Estimating and Quotation Management</u></p> <ul style="list-style-type: none"> <li>• Current inability to reconcile cost of sales (recoverable works). Power and Water do not use the quoting system in Maximo. If under-quoting, no ability to recover.</li> <li>• From July 2019 each new connection will have a contract associated and therefore quotes will be required (legally binding), this system will manage this obligation and contractual relationship.</li> </ul>	<p><u>Stream 1: Estimating and Quotation Management</u></p> <ul style="list-style-type: none"> <li>• Improve the ability to conduct effective estimation for network requests and therefore reducing inefficiencies, and supporting the ability to build process maturity. Currently processes are rudimentary and do not provide the automated checks and logging required for an effective system. For example, there is no tool to check that the tender documentation was released.</li> <li>• Reduce the significant key person risk as the current system does not support comparisons on previous jobs; there is a complete reliance on key staff professional knowledge.</li> <li>• Improved ability to effectively learn lessons relating to estimation and quotation of network requests across the organisation, and from other DNSPs. The preferred option will support building maturity in the organisation; knowledge capture.</li> </ul>
<p><u>Stream 2: Fleet Management</u></p> <div style="background-color: black; width: 100%; height: 100%; min-height: 150px;"></div>	<p><u>Stream 2: Fleet Management</u></p> <ul style="list-style-type: none"> <li>• Improve the ability to understand the usage trends across the fleet allowing for more effective whole-of-fleet planning and procurement activities.</li> <li>• Improved system for vehicle booking delivering an efficient and accurate system to drivers.</li> <li>• Greater efficiency in maintenance planning for each vehicle and for reduction in the manual processes to record relevant checks and maintenance activities.</li> <li>• Reduced manual reporting burden as system will deliver a suite of automated</li> </ul>

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Tangible benefits	Intangible benefits
	reports.
<p><u>Stream 3: Operational Risk Reporting</u></p> <p>[Redacted text]</p>	<p><u>Stream 3: Operational Risk Reporting</u></p> <ul style="list-style-type: none"> <li>• Supports the achievement of Power and Water Board’s Strategic Direction key outcome of ‘zero harm’ by improving operational safety risk management. The system supports the achievements of the Cultural Safety project.</li> <li>• Improved communication of risk to management and senior management.</li> <li>• Enhance the ability to learn lessons across Power and Water and other Power and Water business units leading to a reduction in the overall risk profile.</li> </ul>
<p><u>Stream 4: Drawing Management System</u></p> <p>[Redacted text]</p>	<p><u>Stream 4: Drawing Management System</u></p> <ul style="list-style-type: none"> <li>• Enable the ability to integrate with mobility and scheduling systems, utilising functionality to send drawings remotely. This will lead to an ability to deploy more crews remotely and a reduction in time to return to depot; this benefits will be realised as part of the mobility project.</li> <li>• Standardised processes for drawing can be more effectively introduced allowing for more uniform control across the technical drawings.</li> <li>• Improved standardisation will promote better information transfer between Power and Water business units.</li> <li>• More effective drawing management will reduce the training burden as processes will be more in line with industry best practices.</li> <li>• ‘Lost’ drawings will no longer be an issue, saving time for re-development and the downstream impact of delays to works.</li> <li>• The improvements can support safety activities by ensuring efficient and</li> </ul>



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Tangible benefits	Intangible benefits
	<p>accurate access to the drawings with a reduced chance of error. The system will also improve 'Dial before you Dig' services.</p> <ul style="list-style-type: none"> <li>• Current system impedes effective governance and does not align with either the 'Safety in Design' initiative or support compliance with ISO 9001 Quality Management.</li> </ul>
<p><u>Stream 5: EBA Interpreter</u></p> <ul style="list-style-type: none"> <li>• Reduction in the risk of incorrect payment of staff.</li> <li>• Improve staff awareness of the EBA and its proper implementation.</li> <li>• Reduction in the accumulation of excessive leave balances and other entitlements.</li> </ul>	<p><u>Stream 5: EBA Interpreter</u></p> <ul style="list-style-type: none"> <li>• A reduced management burden in the requirement to check for compliance, informing staff of the EBA, and managing pay issues and disputes.</li> <li>• The system will under-pin a culture of EBA awareness and compliance.</li> <li>• Ability to understand the awards to staff when rostering, and therefore the impact.</li> <li>• Reduction in staff pay disputes.</li> <li>• Reduction in staff frustration with ability to interpret the EBA.</li> </ul>

## 6.2.7 System Operations

### 6.2.7.1 Project Summary

Power and Water in its role as the Network Provider in the Northern Territory is required to provide many of the services that the Australian Energy Market Operator (AEMO) provides in other Australian jurisdictions in order to facilitate retail competition. These services include facilitating several business-to-business (B2B) transactions, including NMI discovery and customer transfers, and market settlement. As such, Power and Water is required to invest in ICT systems to provide these services effectively and efficiently.

### 6.2.7.2 Business Need

Power and Water, as the Network Provider is required to manage certain B2B functions to facilitate retail competition. While it is possible to manage these processes manually, this will be a labour intensive process and has limited scalability. Power and Water's current processes rely on emails and manual forms, which lead to significant delays in the provision of standing data (NMI discovery) and customer transfers. There is a commitment by the Northern Territory Government and the Utilities Commission to promote and facilitate retail competition. Real time processing and automation of process will be a significant enabler and provide an environment that interstate retailers are familiar with.





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With the predicted removal of the requirement for an interval meter to churn and further market changes are likely to lead to an increase in retailer churn. The manual processes are not expected to be suitable to support the future environment.

There is a further assessment that Power and Water is to have the ability to manage accumulation meters, which will be required to be profiled.

## 6.2.7.3 Options Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• No capital expenditure.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Power and Water will rely heavily on manual processes to conduct the Network Provider functions under the Electricity Retail Supply Code and will likely not be able to efficiently deliver the market expectations.</li></ul>
<b>Option 2 – Implement a Lean System Operations Solution</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• The development of a lean solution will ensure that Power and Water has the ability to develop robust processes to conduct the required Electricity Retail Supply Code obligations.</li><li>• It is assessed that this option will provide significant cost savings compared to contracting AEMO to perform the market operator function in the Northern Territory.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Capital expenditure outlay.</li><li>• Change management activities associated with system and process changes.</li></ul>
<b>Option 3 – AEMO to provide</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• No capital expenditure.</li><li>• Power and Water will not be required to provide the additional market services and system functions.</li><li>• Provide a consistent system for interstate market participants.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• AEMO’s current system scope and requirements are likely overly complex for the scale of the Northern Territory market and will likely result in higher than necessary overall market operations costs.</li></ul>



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	<ul style="list-style-type: none"> <li>AEMO would incur additional costs to expand their system to participants that are not registered under Chapter 2 of the NER, which is currently the case in the Northern Territory.</li> </ul>
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## 6.2.7.4 Preferred Option

The preferred option will be to implement a lean system that is prudently appropriate for the size of the Northern Territory customer base.

### 6.2.7.4.1 Scope for Preferred Option

The solution will use a configured, off-the-shelf solution, such as a Hansen system. The project will also have a dependency on the implementation of the proposed Meter Data Management System project. The scope of this project will cover:

- Mapping of current and target processes,
- Review and analyse available technology options,
- Request tenders for the solution and assess offering,
- Implement the software,
- Implement hardware if required, and
- Train users and conduct change management activities.

### 6.2.7.4.2 Mapping to AER Capital Expenditure Objective(s)

Mapping to the relevant 'Capital expenditure objective(s)' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure is considered necessary to achieve:</i>	
<b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b>	<ul style="list-style-type: none"> <li>• The expenditure will relate entirely to the achievement of compliance. The solution will support the compliance with the B2B Procedures as stated in the Electricity Retail Supply Code. The costs of implementing and maintain this system will lie with Power and Water, as the Network Provider, as stated in the Code.</li> <li>• Additionally, to enable Power and Water to deliver the Network Provider functions for retail competition in accordance with the NTEM framework.</li> </ul>
<b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

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<p>requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services; or</p> <p>(ii) the reliability or security of the distribution system through the supply of standard control services,</p> <p>to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services; and</p> <p>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</p>	
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

## 6.2.7.4.3 Mapping to AER Capital Expenditure Criteria

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

<p>6.5.7(c)(1) <i>the efficient costs of achieving the capital expenditure objectives;</i></p>	<ul style="list-style-type: none"> <li>• The preferred option focuses on the delivery of a model that will reduce the manual processes that will be required for future compliance activities. The proposed scope and costs will be appropriate for Northern Territory market operation and at significantly less than other market solutions, such as MSATS.</li> </ul>
<p>6.5.7(c)(2) <i>the costs that a prudent operator would</i></p>	<ul style="list-style-type: none"> <li>• Power and Water plans to deliver a system that will support compliance with the AER/UC. This system is not a standard system for peer DNSPs, as the function is</li> </ul>



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<p><i>require to achieve the capital expenditure objectives; and</i></p>	<p>performed by AEMO, however, the lean solution proposed is considered to be prudent expenditure.</p>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>• Power and Water will implement the solution on completion of the Meter Data Management System, and therefore will utilise the understanding and experience gained.</li> <li>• The proposed expenditure is comparable to the costs of market implemented lean solution.</li> <li>• Cost of project will be managed through Power and Water’s procurement process.</li> </ul>

### 6.2.7.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<ul style="list-style-type: none"> <li>• Cost avoidance of manually intensive data processing to produce the relevant compliant reports, and</li> <li>• Support achievement of AER/UC compliance.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction of the likelihood of incorrect reporting data, due to the reduction in manual processes,</li> <li>• Improved ability to provide governance checks to the reporting data, and</li> <li>• Benefits to the customer as the system will enable market competition.</li> </ul>

### 6.2.8 RIN’s

#### 6.2.8.1 Project Summary

The AER will be administering the economic regulation of Power and Water under the National Electricity Law (NEL) from 1 July 2019. The AER will issue upon Power and Water a suite of Regulatory Information Notices (RINs):

- Annual Economic Benchmarking RIN (EB RIN),
- Annual Category Analysis RIN (CA RIN),
- Reset RIN, and
- Reporting RIN.

Power and Water is seeking to implement a technology solution to assist with preparation of RIN information, in accordance with the requirements of the AER.

#### 6.2.8.2 Business Need



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Compliance with the RINs is necessary: failure to comply attracts severe penalties. RIN responses should be made by 31 October each year, four weeks after the Statutory Accounts are signed off requiring a short turn-around.

RINs responses involve financial and non-financial asset and operations data, often at a level of disaggregation that is not present in one unified system. Power and Water’s data is held in many systems that do not interact well:

- Maximo – asset data,
- FMS Oracle – finance system,
- RMS Gentrack– billing system and Meter Data Management System, and
- ESRI – GIS.

Power and Water summarises the data manually using Excel which does not deal well with large data sets, is time consuming, and difficult as well as expensive to audit each year (as per RIN requirements).

Currently, Power and Water’s expected base resourcing cost to complete the EB RIN, CA RIN and Reporting RIN:

- About 4 FTE for 3 months each year, more if run as a project each time, and
- The current challenge is due to the need to provide historical information in a form not previously used.

Expected base resourcing cost to complete the Reset RIN:

- About 2 FTE for 3 months every 5 years, more if run as a project each time.

These estimates are based on the issues surrounding collating the information that will form the response to the Reset RIN to be served on Power and Water.

In addition to the current resource requirements, significant portions of the data provided in our January 31 RIN has needed to be estimated. System improvements will improve this situation and enable Power and Water to provide actual data in the future.

### 6.2.8.3 Options Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Defer capital expenditure.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Requires a significant increase in labour to satisfy the requirements,</li> </ul>



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	<ul style="list-style-type: none"> <li>Increases use of estimated rather than actual data, and</li> <li>Increases potential for errors as the data will be extracted and manipulated manually, which may risk regulatory non-compliance.</li> </ul>
<b>Option 2 – Implement a Bespoke, Stand-alone ICT system</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Will automate the current manual data collection and collation processes.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Can only be used for this purpose,</li> <li>May be obsolete or require significant reinvestment if the data required for the RIN’s changes, and</li> <li>Cannot fully provide a trail for the RINs data, as such the data to be submitted within the RINs may not be fully reliable.</li> </ul>
<b>Option 3 – Implement Using Existing Power and Water Business Intelligence Tools</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Enables Power and Water to further leverage existing investment in ICT Business Intelligence Tools,</li> <li>Interfaces to many of Power and Water’s systems have already been built for other purposes, and</li> <li>Improves the audit trail of the data compilation for RINs reporting</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Current Business Intelligence tools are not very user-friendly and may require investment.</li> </ul>

### 6.2.8.4 Preferred Option

Option 3, to use existing Power and Water business intelligence tools, is considered the preferred option as it leverages existing investments and is the closest solution to support Power and Water in providing reliable RINs reporting.

Option 1 – Do Nothing is not considered a viable option as it introduces additional opex costs without any potential to reduce expenditure in the future. It also introduces additional risk for errors.

Option 2 – Implement a bespoke, stand-alone ICT system for RIN reporting is also not the preferred option. Although it would minimise the risk of non-compliance with AER RIN reporting requirements it does not leverage Power and Water’s previous ICT investment in business intelligence tools, therefore not the most prudent option.



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## 6.2.8.4.1 Scope for Preferred Option

The scope of the preferred option will include the following activities:

- Document business requirements,
- Analyse sources of data,
- Design reports in Power and Water’s business intelligence toolset,
- Develop interfaces, and
- Test and deploy to users
- Training and change management activities

## 6.2.8.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• The proposed project directly supports the ability for Power and Water to comply with the AER regulatory obligation in meeting the AER RIN for:             <ul style="list-style-type: none"> <li>• Annual Economic Benchmarking RIN (EB RIN),</li> <li>• Annual Category Analysis RIN (CA RIN),</li> <li>• Reset RIN, and</li> <li>• Reporting RIN.</li> </ul> </li> </ul> <p>As reliable RIN responses are required four weeks after the Statutory Accounts are signed-off, without an effective system to automate the process where possible, there is a significant risk of non-compliance.</p>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services; or</b></p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

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<p>control services, to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services; and</p> <p>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</p>	
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

## 6.2.8.4.3 Mapping to AER Capital Expenditure Criteria

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

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>The preferred option is a prudent decision as it will leverage existing Business Intelligence tools and experience across Power and Water, utilising recent investments to ensure the successful implementation. The project will support significant cost avoidance to resource manually intensive processes.</li> </ul>
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>The preferred option is assessed to be a lean solution to meet the needs of the RIN requirements, and thus less capital expenditure than other DNSPs for similar outcomes. Further, the option intends to utilise current, and future, Power and Water business intelligence solutions to minimise the expenditure to Power and Water for both ICT capex, opex, and non-ICT opex.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>Costs of the preferred option are estimated, however, these are reflective of the costs for similar projects that have been implemented in Power and Water.</li> <li>More accurate expenditure estimations will be provided with further project progress, project costs will be reviewed through Power and Water procurement processes to ensure market competitive costs.</li> </ul>





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## 6.2.8.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
[REDACTED]	<ul style="list-style-type: none"><li>• Improvements to RIN modelling processes resulting in better engaged staff and the opportunity to further enhance processes over time.</li><li>• Increased level of data reliability in line with the requirements of regulatory reporting, as errors due to manual handling will be eliminated.</li><li>• Improved confidence of data compliance provided to the regulator and avoidance of inaccurate assertions.</li><li>• Minimised disruption to staff required to conduct the manual RIN audit data analysis.</li><li>• Minimise the training of staff to conduct non-standard tasks and the reduction in key person dependency.</li><li>• Supports improved ability to plan for RIN audit activities, and reduces the risk of not being suitably prepared, and thus non-compliance.</li></ul>

## 6.3 Remediate the Core

### 6.3.1 Business Context

Power and Water has invested significantly in technology to support its core business systems over the past 6 years. For multiple reasons it has encountered major issues, including the following:

- **Lack of data integrity and reliability** - The lack of a clear information management model; ineffective data governance practices; system architecture; unnecessary system complexity; and poor system integration between Power and Water systems/processes significantly hampers business performance and reliable financial record keeping.
- **Inefficient business processes** - Supporting systems processes have capability gaps; key operational systems (e.g. Maximo) are not being used appropriately and have too many unnecessary system customisations causing inefficient processes and creating higher technology and business operational costs.



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- **Overtly customised systems** - Maximo has over 240 customisations and is being used for financial tasks for which it was not designed for. This has resulted in system integrity/reconciliation issues and higher maintenance costs.
- **Ineffective business reporting** - Compounding data integrity issues are causing lack of trust and confidence in underlying information systems for efficient and timely decision making.
- [REDACTED]
- **Weak technology lifecycle management** - Capabilities to provide contemporary solutions and enhancements to asset management and workforce mobility are limited without changes proposed in the Remediate the Core Program.

These issues combined with process enablement deficiencies have severely impacted Power and Water and reduced its ability to operate efficiently and achieve all the desired benefits from its technology investments. Power and Water have comprehensively assessed the current situation and identified a program of work to improve the accuracy/integrity of its core systems.

### 6.3.2 ICT Enabling Initiatives

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Program	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Revenue Management System	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Financial Management System	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Maximo and ESRI Upgrade	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>Total Expenditure – Remediate the Core</b>	<b>\$ 3,293</b>	<b>\$ 5,506</b>	<b>\$ 3,264</b>	<b>0</b>	<b>0</b>	<b>\$ 12,063</b>



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## 6.3.3 Revenue Management System

### 6.3.3.1 Project Summary

[Redacted]

### 6.3.3.2 Business Need

Power and Water is currently facing the following challenges relating to the current system and processes for revenue management:

**Gentrack Capability.** [Redacted]

- **Increased Demand on CSC.** In the new Power and Water structure, CSC has been repositioned as a service provider. In this role, importance has been placed on the CSC to develop financial instruments to fully recover Power and Water costs.
- **Customer Service Portal.** The current version of the system does not provide a customer self-service portal which is necessary to meet customer expectations.

**Increased Demand on RMS.** [Redacted]

### 6.3.3.3 Options Analysis

Option	Comments
Option 1 – Do Nothing	<u>Advantages:</u> <ul style="list-style-type: none"> <li>• Delay ICT capital expenditure into a future RCP.</li> </ul>



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	<p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Increased risk of system failure due to age resulting in reputational damage,</li><li>• Increased risk of lost revenue,</li><li>• Increased risk to maintain the system due to the lack of availability of hardware components leading to an overall increase in maintenance costs,</li><li>• Increased risk of non-compliance due to incorrect application of tariff structures,</li><li>• Limited Power and Water’s tariff reform program,</li><li>• Increasing future ICT and business opex to support a currently out of vendor system and related processes, and</li><li>• Loss of opportunity to exploit new technologies.</li></ul>
<p><b>Option 2 – Upgrade Gentrack</b></p>	<p>[Redacted content]</p>
<p><b>Option 3 – Replacement System by</b></p>	<p>[Redacted content]</p>



# ICT Capital Expenditure Plan



## 6.3.3.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• Ability to apply already approved tariffs correctly without manual correction.</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services;</b> or</p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</b></p>	<ul style="list-style-type: none"> <li>• An upgraded RMS will enable Power and Water to reliability provide distribution network billing function, of the standard control services of a DNSP.</li> <li>• The preferred option represents the lowest risk and financial selection to maintain the network billing function reliability.</li> </ul>
<p><b>6.5.7(a)(4) maintain the</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>



# ICT Capital Expenditure Plan

<p>safety of the distribution system through the supply of standard control services</p>	
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## 6.3.3.4.3 Mapping to AER Capital Expenditure Criteria

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

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>• The preferred option focuses on reducing the complexity and operating expenditure with the current inefficient manual work around and processes required to compensate the deficiencies of the current billing functions.</li> <li>• Additionally, it reduces Power and Water’s operational risk from the current out of vendor support system.</li> </ul>
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>• Expenditure forecast for the preferred option are comparable to similar scope Gentrack upgrade projects implemented in industry.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>• There is a realistic expectation that demand forecast is accurate across RCP1, and will confirmed on competitive market pricing with Power and Water’s procurement and tendering processes. Additionally, Power and Water being the only DNSP currently, or planned, to work in the Northern Territory, the cost of the project is relatively unaffected by the market demand.</li> </ul>

## 6.3.3.4.4 Benefits of Preferred Option

The proposed expenditure will provide the following tangible and intangible benefits:

Tangible benefits	Intangible benefits
<div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 80%; margin-top: 5px;"></div> <div style="background-color: black; height: 15px; width: 90%; margin-top: 5px;"></div> <div style="background-color: black; height: 15px; width: 60%; margin-top: 5px;"></div> <div style="background-color: black; height: 15px; width: 100%; margin-top: 5px;"></div>	<ul style="list-style-type: none"> <li>• Risk reduction of failure of the current system,</li> <li>• Increased ability to adapt to changes in market regulation,</li> <li>• Enable greater customer focused service and timely response to</li> </ul>

# ICT Capital Expenditure Plan



<p>[Redacted text]</p>	<p>enquiries,</p> <ul style="list-style-type: none"><li>• Ability to detect revenue loss at earlier stages/revenue assurance,</li><li>• Moving towards paperless environment with greater opportunity to drive digital billing, smart phone and internet capability, and</li><li>• Improving customer end to end experience starting with customer self-service.</li></ul>
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## 6.3.4 Financial Management System

### 6.3.4.1 Project Summary

Power and Water is to efficiently manage its expenditure to ensure that it maintains the quality, reliability, safety and security of electricity supply and complies with all applicable regulatory obligations.

### 6.3.4.2 Business Need

Power and Water is currently facing the following challenges relating to the current system and processes for financial management:

- **Under-utilised FMS.** Power and Water’s financial system FMS is delivered through an Oracle eBusiness Suite finance module. Historically, the utilisation of FMS solution and Maximo has seen financial functions capable of being performed in FMS being delivered through Maximo. Oracle system is underutilised and Power and Water is incurring cost and process work to run two sets of financials.
- **Duplication Inefficiencies.** With the proposed upgrade of Maximo, going forward customised and duplicate functions will be removed from Maximo and the financial functions will be restored to FMS to ensure the best use of the enterprise business tools. Allowing the solution to stay as currently deployed will result in duplicate or lost functionality. Features provided through Maximo would have to be customised to return functionality that existed before the upgrade.
- **Alignment with Industry Practice.** The separation of financial function from asset management systems is a consistent practice across most utilities in Australia; current Power and Water systems and processes do not support this.





# ICT Capital Expenditure Plan

## 6.3.4.3 Options Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<u>Advantages:</u> <ul style="list-style-type: none"> <li>Reduction in expenditure within the RCP.</li> </ul> <u>Disadvantages:</u> <p>[Redacted]</p> <p>[Redacted]</p>
<b>Option 2 – Extend Use of Current System</b>	<u>Advantages:</u> <ul style="list-style-type: none"> <li>[Redacted]</li> <li>Lower future financial management system operating expenditure with reduction in the level of customised functions, and</li> <li>[Redacted]</li> </ul> <u>Disadvantages:</u> <ul style="list-style-type: none"> <li>Impacts on business from system and process changes.</li> </ul>

## 6.3.4.4 Preferred Option

The preferred option is to extend the use of the current system. Power and Water is to invest so that it can maximise its existing investment in the FMS Oracle platform supporting the upgraded version of Maximo and the opportunities to simplify reporting capabilities across the Finance area. This will return both systems to their core capabilities.

### 6.3.4.4.1 Scope for Preferred Option

This option involves analysing and mapping out related capabilities and process within core business platforms (FMS, CMS and Maximo). The work will be facilitated by external consultants who specialise the Oracle Business Suite Financial tools to ensure that use of the Oracle tool set is standardised and reflects a 'vanilla' installation.

This project will require the following scope of work:



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- Data foundation project to provide current, correct and complete financial management data,
- Restore core financial management functionality of Oracle FMS,
- Alignment of system functionality, including data and functional integrations, to the core Maximo and ESRI system functions, and
- Determine and manage changes to financial systems and business functions.

It is to be noted that Oracle Financials system (FMS) will hold duplicate functionality to Maximo once it is upgraded. A decision point and transition period of capabilities between each system creates a dependency for the commencement for FMS (Oracle) changes.

## 6.3.4.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services; or</b></p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p>	<ul style="list-style-type: none"> <li>• Financial management functions form represent core requirements for standard control services. The planned expenditure to extend the functionality of the current Oracle FMS will improve Power and Water's efficiency in delivering these functions.</li> <li>• The option to extend the functionality of Oracle FMS represents a prudent management decision in maximising return from system investments.</li> </ul>

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Mapping to the relevant 'Capital expenditure objective(s)' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure is considered necessary to achieve:</i>	
(iv) maintain the reliability and security of the distribution system through the supply of standard control services.	
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services	<ul style="list-style-type: none"> <li>N/A</li> </ul>

## 6.3.4.4.3 Mapping to AER Capital Expenditure Criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure reasonably reflects each of the following:</i>	
6.5.7(c)(1) <i>the efficient costs of achieving the capital expenditure objectives;</i>	<ul style="list-style-type: none"> <li>Power and Water's selected option to extend use of the current Oracle FMS, represents appropriate efficient and prudent management approach on expenditures:                             <ul style="list-style-type: none"> <li>Maximise utilisation and efficiency of existing ICT assets, and</li> <li>Efficient expenditure requirements based on the management approach of implementing to the scope of 'vanilla' system functionalities.</li> </ul> </li> </ul>
6.5.7(c)(2) <i>the costs that a prudent operator would require to achieve the capital expenditure objectives; and</i>	
6.5.7(c)(3) <i>a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</i>	<ul style="list-style-type: none"> <li>Forecasted expenditures are in line with industry projects, provided by system vendors and competitive costs will be verified through Power and Water's RFQ and procurement processes at the time of implementation.</li> </ul>

## 6.3.4.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

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Tangible benefits	Intangible benefits
<ul style="list-style-type: none"> <li>• Efficiencies in producing financial statements and analysis, and</li> <li>• Avoidance of overhead costs though further introduction of inefficiencies and the staff required as a result.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in works programme cost through more effective financial management.</li> </ul>

## 6.3.5 Maximo and ESRI Upgrade / Reimplementation

### 6.3.5.1 Project Summary

[Redacted]

### 6.3.5.2 Business Need

[Redacted]

[Redacted]

[Redacted]

[Redacted]

### 6.3.5.3 Options Analysis

Option	Comments
<p><b>Option 1 – Do Nothing</b></p>	<p>[Redacted]</p>

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	<p>[Redacted content]</p>
<p>Option 2 – Upgrade Maximo and ESRI</p>	<p>[Redacted content]</p>

# ICT Capital Expenditure Plan



	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
<b>Option 3 – Replace Maximo and/or ESRI</b>	<p><u>Advantages:</u></p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>

### 6.3.5.4 Preferred Option

[REDACTED] The implementation of off-the-shelf version of these applications is assessed to address the current challenges.

#### 6.3.5.4.1 Scope for Preferred Option

The scope of the work will be conducted across two streams of work; the Maximo Upgrade and the ESRI Upgrade. All work will be guided by the following principles:



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- The AMC Asset Management blueprint will be a key source for driving the Maximo and ERSI business scope.
- Given the enterprise nature of these projects, all divisions will be involved in the scoping of the program.
- Power and Water will have a no customised systems mindset to these projects unless it is agreed with strict governance controls.

## Stream 1: Maximo Upgrade:

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

### 6.3.5.4.2 Mapping to AER Capital Expenditure Objective(s)

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

6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
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Mapping to the relevant 'Capital expenditure objective(s)' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure is considered necessary to achieve:</i>	
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b></p> <p><b>(i) the quality, reliability or security of supply of standard control services; or</b></p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</b></p>	<div style="background-color: black; width: 100%; height: 150px; min-height: 150px;"></div>
<div style="background-color: black; width: 100%; height: 80px; min-height: 80px;"></div>	<div style="background-color: black; width: 100%; height: 80px; min-height: 80px;"></div>



# ICT Capital Expenditure Plan



[Redacted]	
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]

### 6.3.5.4.4 Benefits of Preferred Option

High level modelling was conducted using potential saving scenarios. These savings are only indicative at this time, and have utilised a 'medium' saving scenario (see the Remediate the Core Business Case for further detail). The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
[Redacted]	<ul style="list-style-type: none"> <li>Enhanced staff engagement,</li> <li>Easier to adopt new practices / processes from other jurisdictions,</li> <li>Increased efficiencies enabled as upgrades will support the mobility project,</li> </ul>

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Tangible benefits	Intangible benefits
[REDACTED]	<ul style="list-style-type: none"><li>• Better asset management planning and decision making as data quality improved leading to more effective allocation of resources,</li><li>• Increase of system reliability,</li><li>• Improved response to issues as data more visible, accessible and accurate,</li><li>• Improved ability to support compliance activities through efficient delivery of RINs for AER Reporting, and</li><li>• Reduction in safety risk through improved understanding of asset risk across Power and Water, and Power and Water.</li></ul>

## 6.4 ICT Application & Infrastructure Refresh

### 6.4.1 Business Context

Power and Water manages a set of enterprise ICT infrastructure assets which underpin its core network business processes in sustaining its objectives to provide quality, reliability and security of network services.

Recurrent expenditure for the periodic refresh of ICT infrastructure is an accepted industry practice and essential to support the enterprise ICT infrastructures that underpin the operations of Power and Water’s core network business functions.



Power and Water’s proposed recurrent forecasted expenditures to refresh ICT applications and infrastructure are in-line with prudent industry ICT asset management practices.



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## 6.4.2 ICT Enabling Initiatives

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Program	Year 1	Year 2	Year 3	Year 4	Year 5	RCP
	2019/20	2020/21	2021/22	2022/23	2023/24	Total
Enterprise Application Refresh	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enterprise Infrastructure Refresh	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>Total ICT Application &amp; Infrastructure Refresh</b>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Both the Enterprise Application Refresh and Enterprise Infrastructure Refresh ICT Programs are classified as ICT Asset Replacement programs.

## 6.4.3 Enterprise Application Refresh

### 6.4.3.1 Project Summary

Power and Water’s proposed ICT Capex forecast include expenditures to refresh the following ICT Enterprise application assets:

- HPE Records Manager [REDACTED]
- SAP Business Objects (Business Intelligence),
- Oracle Fusion Middleware,
- Intranet (Squiz),
- Oracle Application Express (Oracle APEX) (Small Systems),
- Cognos TM1,
- Internet/Self Service (Squiz),
- ESRI (GIS),
- CribMaster (Inventory Management),
- NEC Q-Master,
- Outage Management System,
- Microsoft Office,
- Internet Explorer, and
- Microsoft Exchange

### 6.4.3.2 Business Need

Enterprise ICT applications underpin Power and Water’s core business processes. [REDACTED]

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## 6.4.3.3 Option Analysis

Option	Comments
<p><b>Option 1 – Do Nothing</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Defer capital expenditure.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>[Redacted]</li> <li>[Redacted]</li> <li>[Redacted]</li> <li>[Redacted]</li> <li>[Redacted]</li> </ul>
<p><b>Option 2 – Upgrade Enterprise Applications on Regular Basis</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Provides a quality, reliable and secure platform for users to conduct day-to-day operations, and</li> <li>Avoids risk of software failure to impact business operations and avoids any associated cost to manage this risk.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Upgrade capital cost, and</li> <li>Time and effort required to perform upgrades.</li> </ul>

## 6.4.3.4 Preferred Option

The preferred option is Option 2, Upgrade Enterprise Applications on a regular basis. This is the prudent management approach to maintain Power and Water’s enterprise applications in a cost effective manner by leveraging prior investment and maintaining the reliability, security and supply of services.



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## 6.4.3.4.1 Scope for Preferred Option

The following activities are included within the scope of work for these upgrade projects:

- Initiation & Business Engagement,
- Business Requirements,
- Technical Requirements / Product Architecture Changes,
- Updated Design,
- Establish new application environments (dev, test, production),
- Application Migration,
- Testing (System, Integration and User Acceptance),
- End-user Communication, Coordination, Change Management,
- Updated Support Documentation and End-users Training,
- ICT Change Management, and
- Deployment into production.

## 6.4.3.4.2 Mapping to AER Capital Expenditure Objective(s)

Mapping to the relevant 'Capital expenditure objective(s)' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure is considered necessary to achieve:</i>	
6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:  (i) the quality, reliability or security of supply of standard control services; or  (ii) the reliability or security of the distribution system through the supply of standard control services,	<ul style="list-style-type: none"> <li>• [REDACTED]</li> </ul>

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Mapping to the relevant 'Capital expenditure objective(s)' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure is considered necessary to achieve:</i>	
<p><b>to the relevant extent:</b></p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</b></p>	
<p><b>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

## 6.4.3.4.3 Mapping to AER Capital Expenditure Criteria

Mapping to 'Capital expenditure criteria' (Chapter 6, National Electricity Rules) <i>The forecasted capital expenditure reasonably reflects each of the following:</i>	
<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	[REDACTED]
<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	[REDACTED]
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs</b></p>	[REDACTED]



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<i>required to achieve the capital expenditure objectives.</i>	
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## 6.4.3.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<ul style="list-style-type: none"> <li>• Improve ICT enterprise applications and age profiles compatible comparable to industry and supported by Vendors,</li> <li>• Risk of software failure is reduced or eliminated, and</li> <li>• Reduction in opportunity Operating Expenditure increases associated with additional business and IT requirements to business processes on out-dated applications and systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Employee satisfaction will be increased by using up-to-date, modern applications,</li> <li>• Maintain effective ability to work with external organisations by reducing likelihood of application obsolescence,</li> <li>• Productivity improvements from enhanced application features and functions, and</li> <li>• Improved ability to forecast application changes/improvements.</li> </ul>

## 6.4.4 Enterprise Infrastructure Refresh

Enterprise ICT infrastructure underpins Power and Water’s key enterprise business applications which in turn support the Power and Water’s critical business processes. Regularly refreshing critical ICT enterprise infrastructure is required to meet planned business demands on ICT services and maintain reliability of infrastructure services that underpins Power and Water’s core business processes and systems for reliability supply of network services.

### 6.4.4.1 Project Summary

The planned refresh includes enterprise ICT infrastructure assets, such as:

- Servers for virtualisation, communication, applications and networks,
- Infrastructure for communication network functions, including network services, monitoring, switching and routing,
- Databases, data storage, backup and recovery,
- Infrastructure for disaster recovery and business continuity,
- Infrastructure for enterprise application and data integration,
- Infrastructure for enterprise digital and physical securities, and



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- Software and licences required to sustain operating environments and functions, i.e. operating systems and database management systems.

## 6.4.4.2 Business Need

Power and Water’s approach to infrastructure refresh has been to replace-as-needed, and its current fleet of ICT infrastructure are comparatively dated in comparison to industry. The continued use of ageing equipment will likely increase the risk of infrastructure failure with potential impacts to core network business functions and processes

## 6.4.4.3 Options Analysis

Option	Comments
<p><b>Option 1 – Do Nothing</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Defer capital expenditure.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Potential impact to core business processes due to an increased risk of system failure from system capacity and performance issues,</li> </ul> <p>[Redacted text]</p>
<p><b>Option 2 – Upgrade Enterprise Applications on Regular Basis</b></p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>• Provides a quality, reliable and secure platform for users to conduct core Power and Water business processes,</li> <li>• Reduces risk of ICT infrastructure failure to impact business operations and avoids any associated cost to manage this risk, and</li> <li>• Consistent with good industry practice.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Upgrade capital cost, and</li> <li>• Time and effort required to perform upgrades.</li> </ul>





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## 6.4.4.4 Preferred Option

The preferred option is Option 2, Upgrade Enterprise Infrastructure on a regular basis. This prudent option is in line with good industry ICT management practice. It will efficiently maintain Power and Water’s ICT infrastructure hardware and software in a cost effective manner by leveraging prior investment. This option also supports Power and Water in maintaining reliability, security and supply of network services.

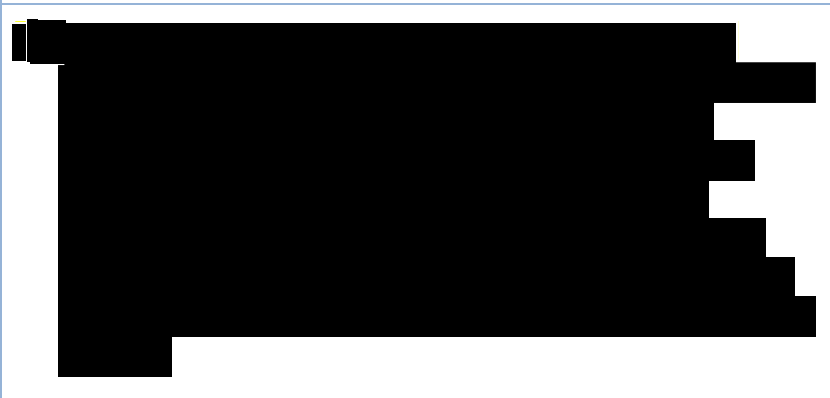
### 6.4.4.4.1 Scope for Preferred Option

The following activities are included within the scope of work for these upgrade projects:

- Initiation & Business Engagement,
- Documentation of Business and Technical Requirements,
- Procurement,
- Implementation
- Testing (System, Integration and User Acceptance),
- End-user Communication, Coordination, Change Management,
- Updated Support Documentation and End-users Training, and
- Deployment into production.

### 6.4.4.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:  (i) the quality, reliability or security of supply of standard control services; or  (ii) the reliability or</b>	

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

security of the distribution system through the supply of standard control services,  
to the relevant extent:  
(iii) maintain the quality, reliability and security of supply of standard control services; and  
(iv) maintain the reliability and security of the distribution system through the supply of standard control services.

[REDACTED]

6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services

- N/A

## 6.4.4.4.3 Mapping to AER Capital Expenditure Criteria

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

6.5.7(c)(1) *the efficient costs of achieving the capital expenditure objectives;*

[REDACTED]



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<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>The expenditure will be prudently managed through Power and Water’s procurement process to ensure competitive market pricing at implementation.</li> </ul>

### 6.4.4.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<ul style="list-style-type: none"> <li>Improve ICT enterprise infrastructure asset and age profiles compatible to industry,</li> <li>Reduces the outage and failure rates of ICT enterprise infrastructures,</li> <li>Maintain the ability to support the forecasted ICT projects through provision of suitable infrastructure, and</li> <li>Maintain the ability to conduct the required ICT security activities.</li> </ul>	<ul style="list-style-type: none"> <li>Support the capability of Power and Water to react to new or more efficient technology and business opportunities by maintaining current and effective ICT Infrastructure; this may not be possible with ageing infrastructure.</li> </ul>



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## 6.5 Customer Service

Power and Water is committed to achieve its strategic goal to become ‘a customer-centric business which understands our customer’s needs and expectations, with the responsibility for providing a positive customer experience embedded in all parts of our business.’

In order to accomplish this, Power and Water must react to the changing customer landscape in response to disruptive external factors, such as climatic conditions and new technologies. The market will be shaped by customers who have become more demanding in their desire to more closely manage the delivered services. Therefore, Power and Water must better understand customer needs and expectations, and align systems and process to deliver to these.

### 6.5.1 Business Context

The first phase of the Power and Water Operating Model program in 2016 identified that Power and Water lacked ownership of their customers and had limited understanding of their customer service needs.

Power and Water has a vision ‘to be a best practice, commercially-focused and customer-centric multi-utility respected by the community for its contribution to the Northern Territory economy and its pursuit of the long-term interests of consumers’, as a critical enabler to being a customer-centric multi-utility. There is a need for better decision making based on an understanding of what motivates customers to engage.

To help achieve this vision, Power and Water will closely align its customer service programs to these expectations, as well as to address the concerns voiced by its customers. Through the actions of its Stakeholder and Customer Engagement Strategy, Power and Water has engaged the various segments of its electricity consumers and stakeholders to capture and confirm their values and preferences for their network service provider relationship.

### 6.5.2 ICT Enabling Initiatives

The table below summarises the proposed ICT Capex expenditures required for Power and Water to address its customers’ expectations and to achieve the objectives outlined within its Stakeholder and Customer Engagement Strategy:



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(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Program	Year 1 2019/20	Year 2 2020/21	Year 3 2021/22	Year 4 2022/23	Year 5 2023/24	RCP Total
Customer Relationship Management	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Meter Data Management	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>Total Expenditure for Customer Service Business Area</b>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

## 6.5.3 Customer Relationship Management

### 6.5.3.1 Project Summary

Power and Water intends to implement a new Customer Relationship Management (CRM) system to provide functionality for enhanced interactions with customers and support the strategic goal of achieving a more customer focused business. The project will enhance Power and Water’s ability to manage electricity customer information, preferences, engagement and interactions, required to address customer concerns as part of Power and Water’s obligations as a DNSP.

Please note that the timing for implementation of this project is heavily dependent on availability of resources, both internal and external, and will need to be coordinated with several large ICT Programs such as Remediate the Core.

### 6.5.3.2 Business Need

Power and Water is currently facing the following challenges relating to the current system and processes for Customer Relationship Management:

- Current Limited Capability.** Power and Water needs to have a ‘*deep understanding of our customers*’ and current systems do not support this requirement. The current CRM function is conducted using a version of Gentrack software which has limited ability for integration. This system only allows for simple customer management and relies on manually-entered, free-text memos to track customer interactions. As such, the system doesn’t allow for true stakeholder management nor provide a single source of truth for each relationship that a capable, dedicated CRM system would provide.
- Need for a Unified System.** Power and Water requires a single, unified system to record interactions with each customer (events, issues) to assist with future interactions as well as enable alerts to proactively intervene before events occur that negatively affect them.



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The system should also monitor, report and escalate deviations from agreed service standards.

- **Improved Communication.** Power and Water, like other DNSPs, needs a two-way communication flow to effectively inform customers of business progress and important information regarding work requests or network activities that may impact them.
- **Customer Segmentation.** Power and Water needs the ability to segment customers, or to accumulate them (e.g. a community or town), to provide different services and address different priorities or preferences for different customer groups.

### 6.5.3.3 Option Analysis

Option	Comments
<b>Option 1 – Do Nothing</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• Reduction in capital expenditure across the RCP.</li></ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"><li>• Power and Water does not currently have a system that effectively manages the customer relationship; the use of the billing system as a de facto customer relationship manager has significant limitations, such as poor integration of customer data. Industry trends indicate that customer demands will increase, however Power and Water will not have a system that can effectively support management of, and interactions with, customers.</li><li>• Likely increase in future Opex as a result of increasing volume and complexity in customer management processes.</li><li>• Loss of opportunity to provide customer trends and information across Power and Water functions.</li><li>• This option will limit the ability for integration of Power and Water customers across each of the business units, and therefore prohibit the ability to share knowledge and resources.</li></ul>
<b>Option 2 – Implement a CRM</b>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• A dedicated CRM system will provide the ability to develop Power and Water customer understanding through data collection and management. Improved customer understanding will allow for Power and Water to address the concerns of the electricity customers, with enhanced business efficiency and an improved customer experience.</li><li>• A CRM will provide Power and Water customer management functions in line with industry.</li><li>• An effective CRM system will enable informed decision making based on an understanding of what motivates customers to</li></ul>



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Option	Comments
	<p>engage, enabling a customer focus to Power and Water delivered services.</p> <ul style="list-style-type: none"> <li>• A CRM will support future opportunities that require deep customer knowledge.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>• Significant ICT capital expenditure.</li> </ul>

## 6.5.3.4 Preferred Option

The preferred option is for the implementation of a CRM, either as a stand-alone system or as a new module within the Gentrack system.

### 6.5.3.4.1 Scope for Preferred Option

The following work is to be conducted under the scope of the project:

- Assess various technology options,
- Conduct readiness assessment and conduct required cleansing/preparation of the current customer data,
- Implement new software,
- Implement new hardware, if required,
- Migrate existing customer data,
- Testing, and
- Training and Change Management.

### 6.5.3.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or</b></p>	<ul style="list-style-type: none"> <li>• The CRM will support Power and Water in the reliability of its standard control services through more effective customer communications, customer engagement and safety management processes. The current</li> </ul>



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

<p>requirement in relation to:</p> <p><b>(i) the quality, reliability or security of supply of standard control services; or</b></p> <p><b>(ii) the reliability or security of the distribution system through the supply of standard control services,</b></p> <p>to the relevant extent:</p> <p><b>(iii) maintain the quality, reliability and security of supply of standard control services; and</b></p> <p><b>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</b></p>	<p>implementation of Gentrack does not have the functionality required to effectively record Power and Water's interactions with its customers in managing their expectations.</p> <ul style="list-style-type: none"> <li>• The CRM will support the quality of the delivery of standard control services through improved understanding and engagement relating to customers' expectations.</li> </ul>
<p><b>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</b></p>	<ul style="list-style-type: none"> <li>• The CRM will provide enhanced tracking of Life Support customers</li> </ul>

## 6.5.3.4.3 Mapping to AER Capital Expenditure Criteria

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

<p><b>6.5.7(c)(1) the efficient costs of achieving the capital expenditure objectives;</b></p>	<ul style="list-style-type: none"> <li>• The preferred option focuses on augmenting the current Gentrack system with an updated CRM module or a new stand-alone CRM system to minimise the complexity and risk of implementation, maximise the integration with the billing system and minimise process change to staff.</li> </ul>
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<p><b>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</b></p>	<ul style="list-style-type: none"> <li>Costs of the preferred option reflects the lower range of market costs for the implementation and associated change management activities required to deliver an effective customer management capability that will support Power and Water’s strategic goal to be a customer centric corporation.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>The cost of the option is reflective of other CRM implementations for a business of similar size and with a commensurate customer base.</li> </ul>

## 6.5.3.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

Tangible benefits	Intangible benefits
<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<ul style="list-style-type: none"> <li>Improved management of customer data, allowing for information to be accessed efficiently and appropriately by staff.</li> <li>Will provide historical and current customer data, to enable Power and Water customer service personnel to improve the delivery of standard control services.</li> <li>An effective CRM will support the building of a mature customer data-set that will enable targeted network services messaging.</li> <li>An improved understanding of Power and Water’s customer base will position Power and Water to meet customer expectations deliver standard control services requiring mature customer data.</li> <li>Sets up an integrated and reliable foundation that will enable advancement in smart meter capability that will benefit consumers.</li> <li>An enhanced CRM will unlock the ability</li> </ul>

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Tangible benefits	Intangible benefits
	to develop the interfaces to support omni-channel business communications.

## 6.5.4 Meter Data Management

### 6.5.4.1 Project Summary

Power and Water is in the process of implementing a Meter Data Management System (MDMS) to improve asset utilisation, reduce financial risks associated with Advanced Metering Infrastructure (AMI) and support the development of new billing arrangements. It will address customer engagement feedback on estimated or incorrect reads and consequent retail billing issues.

### 6.5.4.2 Business Need

Power and Water is currently facing the following challenges relating to the current system and processes for meter data management:

- Compliance.** Power and Water is in the process of implementing the required systems and processes needed to comply with the Northern Territory specific elements (Chapter 7a) of the NER during RCP1. The specific clauses to be addressed by a dedicated Meter Data Management System are:

7A.3.1(b)	7A.8.2(a)	S7A.4.7.1(b)(4)
7A.3.1 (c)	7A.8.3(a)	S7A.4.7.4(b)(6)
7A.8.1(b)	7A.8.4	
7A.8.1(c)	7A.8.5	
7A.8.1(d)	S7.3.1.3	
7A.8.1(e)	S7A.3.4 to 7A.3.14	
7A.8.1(g)	S7.4.6.1(b)	
7A.8.1(i)	S7A.4.7.1(a)(4)	

- New Regulatory Framework.** As of 1 July 2019, Power and Water is required to follow the National Energy Rules (NER) for billing computations. This requires the validation, substitution and estimation methodologies to be in accordance procedures in chapter 7A. Prior to 1 July 2019, rules for validation, substitution and estimation of meter reads was performed in the Revenue Management System (RMS) and did not need to comply with the NER for billing computations.
- Multiple Meter Types.** Power and Water currently manages multiple meter types, loggers and head-ends along with multiple metering technologies. These technologies



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include phone-based system, a radio mesh network for some remote communities and manual reads for residential areas where interval meters are not yet installed. Power and Water anticipates having to update existing meter reading, customer information and billing systems to handle the volume of data, to receive input from multiple meter reading sources and to provide more advanced analytics for load data.

- **Multiple Meter Data Management Systems.** Power and Water currently uses three separate applications to facilitate meter data management:
  - MV90 - manages interval meter data collection;
  - MVRS - manages mass market meter reading; and
  - RMS - manages meter estimations, meter stock, meter service requests, route management and meter consumption.
- **Exploitation of Data.** Power and Water wishes to fully exploit metering and consumption data from all meters in use within its infrastructure.
- **Information Separation Requirements.** There is a requirement to maintain separation of billing information belonging to retailers from consumption data within RMS. This requires the migration of meter-specific information from the existing billing system into a separate Meter Data Management System, automating meter reading processes, collating and more closely managing meter information from an asset management perspective.
- **Customer Engagement Feedback.** A key concern raised by customers were the number of meter data errors and consequent retail billing issues. Improved validation, substitution and estimation methods will significantly reduce this.

### 6.5.4.3 Options Analysis

In order to comply with Power and Water's new meter requirements, the Meter Data Management System project will be significantly completed during the first year of the RCP.

A full suite of options was assessed to identify the most efficient approach to ensuring Power and Water will be able to comply with their obligations. Implementing a new Meter Data Management System was identified to be the only option that will enable compliance with the new regulations in a cost effective manner.

### 6.5.4.4 Preferred Option

#### 6.5.4.4.1 Scope for Preferred Option

A Meter Data Management System will enable Power and Water to meet the challenges of processing and managing meter and meter operations data as well as meter read data. The Meter Data Management System will provide a single repository for this data with a variety of analytical capabilities to facilitate integration with other ICT systems including:

- Electricity retailers for customer billing,



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- Outage Management System (OMS) to improve reliability,
- Maximo for asset management and customer and meter work orders,
- ESRI for reliable load data for distribution planning and engineering, and
- Transformer Load Management to provide accurate and timely data for optimising transformer loading and change out programs.

Further, the scope of the Meter Data Management System Project will cover:

- Assessment of the technology options,
- Conduct readiness assessment and validation activities for the existing data,
- Development of two way interfaces between Power and Water’s billing system, Asset Management System, Geographical Information System and metering infrastructure,
- Implementation of the new software,
- Implementation of new hardware (if required),
- Data migration,
- Testing, and
- Training and change management

## 6.5.4.4.2 Mapping to AER Capital Expenditure Objective(s)

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

<p><b>6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;</b></p>	<ul style="list-style-type: none"> <li>• Data from the Meter Data Management System will improve demand profiling and forecasts on its distribution networks.</li> </ul>
<p><b>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</b></p>	<ul style="list-style-type: none"> <li>• Power and Water is required to meet its regulatory and statutory obligations in the National Electricity Rules. The Meter Data Management System will enable them to meet the new obligations under chapter 7A.</li> </ul>
<p><b>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</b> <b>(i) the quality, reliability or security of supply of standard control services;</b> <b>or</b> <b>(ii) the reliability or security of the distribution system through the supply</b></p>	<ul style="list-style-type: none"> <li>• The proposed expenditure seeks to enhance the quality of standard control services by ensuring effective meter management and meter identification. Enable Power and Water to improve the delivery of standard control services relating to meter installation, meter data and meter services with faster and more accurate settlements due to improved data quality.</li> </ul>

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

<p>of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) maintain the reliability and security of the distribution system through the supply of standard control services.</p>	
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

## 6.5.4.4.3 Mapping to AER Capital Expenditure Criteria

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

<p>6.5.7(c)(1) <i>the efficient costs of achieving the capital expenditure objectives;</i></p>	<ul style="list-style-type: none"> <li>• The Meter Data Management System project is driven through a compliance need, however, Power and Water have ensured a cost effective solution through an extensive market test and assessment of effective proven industry and vendor solutions.</li> </ul>
<p>6.5.7(c)(2) <i>the costs that a prudent operator would require to achieve the capital expenditure objectives; and</i></p>	<ul style="list-style-type: none"> <li>• The MDMS project commence prior to RCP1 with approximately 20% of the total cost incurred. The remaining expenditure is planned for the first two years of RCP1: 60% in FY20 and 20% in FY21. Since this will be a competitive market bid for a standard product, there is a high confidence that the expenditure in RCP1 will be efficient.</li> <li>• The estimated costs for the purchase and implementation of a Meter Data Management System are assessed to be reasonable for a prudent operator to deliver an effective system including the associated development of business processes and other related</li> </ul>



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	<p>change management activities.</p> <ul style="list-style-type: none"> <li>The estimated expenditure of Power and Water’s solution is comparably at the lower range of industry Meter Data Management System.</li> </ul>
<p><b>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</b></p>	<ul style="list-style-type: none"> <li>There is a realistic expectation that demand forecast is accurate across RCP 1, due to Power and Water being the only DNSP currently, or planned, to work in the Northern Territory.</li> </ul>

### 6.5.4.4.4 Benefits of Preferred Option

The proposed expenditure will provide the following tangible and intangible benefits:

Tangible benefits	Intangible benefits
<p>In general, the Meter Data Management System is expected to provide enhanced standard network services, improved revenue streams due to more accurate and timely billing, more efficient network operations and a reduced cost of regulatory compliance. Specific benefits expected are:</p> <ul style="list-style-type: none"> <li>Reduction in the manual effort for the validation of the accumulation metering data,</li> <li>Reduction in the volume of estimated bills and adjustments,</li> <li>Increased billing accuracy,</li> <li>Increased detection capabilities for tampering and theft through data validation,</li> <li>Improved revenue capture through the implementation of Pre-Pay with e-Payment,</li> <li>Faster turnaround time for disconnect/connect orders,</li> <li>Cost avoidance through the introduction of more efficient processes, especially as the volume of remote meters is expected</li> </ul>	<p>At the completion of the implementation of the Meter Data Management System, Power and Water expects the following intangible benefits to be delivered:</p> <ul style="list-style-type: none"> <li>Quicker, more accurate settlements due to better quality data,</li> <li>Faster identification of metering installation issues,</li> <li>Enhanced customer satisfaction, more revenue streams and regulatory compliance at a lower cost,</li> <li>Monitored power quality,</li> <li>Improved design quality,</li> <li>Improved design cycle time,</li> <li>Improved load management, and</li> <li>Improved asset utilisation.</li> </ul>

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Tangible benefits	Intangible benefits
<p>to increase,</p> <ul style="list-style-type: none"> <li>• Market efficiency as the Meter Data Management System is expected to facilitate NMI discovery activities and the provision of NMI standing data to potential retail competitors, and</li> <li>• Ability to introduce cost-reflective pricing in the jurisdiction through the implementation of smart meter.</li> </ul>	

## 6.6 Enterprise

Outside of the operational function of power distribution, Power and Water has to effectively manage its internal business functions to ensure commercial sustainability whilst delivering value for money to customers and shareholders. The projects within this focus area will support the Power and Water’s internal business functions.

### 6.6.1 Business Context

Power and Water is a multi-utility and there are key applications that will be required across the corporation to support the delivery of services. Power and Water believes that while business needs may vary slightly between business units, often ICT applications can be implemented that satisfy the requirements of multiple business units across the enterprise. Implementing common ICT applications is generally found to be more efficient to the enterprise and reduces complexity and associated capital and operating costs.

Power and Water’s ICT Strategy identified themes that specify the desire to both enhance the return of investment of core ICT systems and also to develop common platforms for whole-of-enterprise challenges to support needs. Within the Enterprise sphere there is an opportunity to utilise the increased maturity of Power and Water’s information assets, support through the delivery of the Data as an Enterprise Asset project; this will be completed prior to RCP1.



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## 6.6.2 ICT Enabling Initiatives

(Note: All amounts are in \$Thousands in 2017/18 real dollars)

ICT Program	Year 1	Year 2	Year 3	Year 4	Year 5	RCP
	2019/20	2020/21	2021/22	2022/23	2023/24	Total
Data and Reporting Program	██████	██████	██████	██████	██████	██████
<b>Total Expenditure for Enterprise</b>	██████	██████	██████	██████	██████	██████

## 6.6.3 Business Intelligence Data and Reporting Program

### 6.6.3.1 Project Summary

Power and Water, like many modern organisations, requires better and more intuitive business reporting capabilities. This business need will be largely met by major upgrades conducted under the Remediate the Core program described in Section 6.3, however, there is an opportunity to supplement this with a more comprehensive Business Intelligence (BI) framework and capability.

Properly planned and effectively managed information will provide Customers and staff with timely, relevant and accessible data upon which they can make informed decisions relative to business and organisational planning; network design and implementation; energy demands, usage and consumption patterns. The re-engineering of the BI environment will enable sets of data to be managed, integrated and analysed.

Overall the program will deliver:

- An enhanced business reporting capability,
- A more intuitive and responsive business reporting framework,
- Information that can be efficiently and effectively identified, retrieved, processed and reported on for decision making purposes, and
- Replace the need for other reporting solutions such as BIRT, Crystal Reports and FSG.

### 6.6.3.2 Business Need

Power and Water’s Board has noted issues with the reports they receive, and in general Power and Water has identified a trend that reports currently underrepresent the key outcomes, trends and risks, and results in the monitoring of business performance with an inputs, and not a results, focus.

Power and Water is a data rich organisation, however, due to an inadequate reporting capability, poor level of integration between systems and the questionable integrity of





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information, there is ineffective processing of the data into information, nor appropriate access. Significant amounts of data are being captured for operational purposes, but this is not fully leveraged for decision making purposes. Equally there is limited convergence of operational and transactional data for planning and reporting purposes.

Power and Water has identified a need for improved reporting and analytics across a wide range of data-sets to assist better delivery of services and management of the business. The need for management dashboards to understand key business drivers and metrics is a common theme in management discussions. Specifically there is a need for improved reporting in the following business areas:

- Asset management including design, construction, maintenance, condition and costs,
- Meter assets, meter consumption and usage data,
- SCADA/process control data,
- Customer information,
- Financial and budget data,
- Fleet management information,
- Inventory data, and
- Personnel data specifically around leave and vacancies.

Underpinning the need for better reporting capabilities are perceptions that the integrity of data within the enterprise systems lacks integrity. The key issues currently being experienced can be summarised as:

- Limited trust across the business units that data quality is sufficient,
- Non-standard reporting across the business units, and multiple reporting tools being used across the corporation (BIRT, Oracle Discoverer, SAP Business Objects, IBM Cognos),
- Not all data source systems are providing data into the Enterprise Data Warehouse, reducing the capability to use the spectrum of data available to support effective analysis,
- Development of new reports is expensive and can take some time to deliver due to the need for contract resources to do the development required, and
- Due to manual processes used across the organisation, reporting on historical and analytical information is time consuming and often out of date once collated.

### 6.6.3.3 Option Analysis

Option	Comments
Option 1 – Do Nothing	<p>Continue with current processes and maintain the current application architecture.</p> <p><u>Advantages:</u></p> <ul style="list-style-type: none"><li>• No immediate capital investment, however, this is likely to only be delayed until a future RCP.</li></ul>

# ICT Capital Expenditure Plan



Option	Comments
	<p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Continued licencing costs for multiple enterprise business intelligence applications,</li> <li>Continued issues with the lack of standardisation of processes and the manual nature of these processes,</li> <li>Continued high expenditure on contracted resources to build reports,</li> <li>Data sets within the data warehouse will not mature to provide effective future reporting,</li> <li>Power and Water does not maintain capability parity with other DNSPs,</li> <li>Likely increase in future opex to support increasing demand on Power and Water management analysis and report, including electricity market operations, meter management, regulatory and compliance.</li> </ul>
Option 2 – Re-engineer and Upgrade	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> <li>Improved data-sets and enhanced reporting, and a dashboard capability, will make Power and Water data more accessible to relevant users,</li> <li>Support the capability for improved decision making across Power and Water,</li> <li>Reduce the manual effort required to answer critical business questions that require data from more than one system,</li> <li>Develop analytics capability tailored to the specific requirements of the varying user types (executive, business manager, asset managers, casual user),</li> <li>Improved ability to segregate data used for analysis, therefore improving data security,</li> <li>Enable historical and time based reporting,</li> <li>Enable the decommissioning of legacy systems; Oracle Discoverer and BIRT,</li> <li>Improved ability to identify OH&amp;S risks and trends, which could facilitate faster implementation of risk treatments, and</li> <li>Supports the ability to build internal Power and Water reporting and dash-boarding skills.</li> </ul> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> <li>Significant capital expenditure, and</li> <li>Increased change to Power and Water during a period of major</li> </ul>

# ICT Capital Expenditure Plan



Option	Comments
	change activities.

## 6.6.3.4 Preferred Option

The preferred option is for a project to be initiated to re-engineer and upgrade the current Power and Water BI system. Power and Water needs to significantly grow its reporting and analytical capability through the enhancement of the current BI environment based on industry best practice. This platform will ultimately satisfy both operational and analytical reporting requirements and provide a more intuitive and comprehensive business intelligence capability.

### 6.6.3.4.1 Scope for Preferred Option

The following work is to be conducted under the scope of this project:

- Development of an information governance framework and accountabilities to assist in driving improved data quality,
- Development of a BI governance framework to ensure BI capabilities are managed to maximise efficiency, effectiveness and control,
- Identify business reporting requirements and determine gaps between current reporting capabilities and those needed by the business,
- Identification of capability gaps and targets for improved BI uptake across the business,
- Establish an approach as to how time-based data (as per the historians) can be leveraged within a BI environment,
- Simplified data warehouse processes and development methodologies in order to speed up the development of Extract, Transform and Load (ETL) jobs and improve the turnaround time required to add new data elements into the warehouse,
- Development of ETL jobs in order to land the data in the data warehouse,
- Implement the required hardware to support the upgraded system,
- All required testing activities, and
- Training and change management activities as required.

### 6.6.3.4.2 Mapping to AER Capital Expenditure Objective(s)

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

6.5.7(a)(1) meet or manage the expected demand for standard control services over that period;	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
6.5.7(a)(2) comply with all applicable regulatory	<ul style="list-style-type: none"> <li>• The Business Intelligence Data and Reporting Program will indirectly support compliance through improving the</li> </ul>



# ICT Capital Expenditure Plan

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

<p>obligations or requirements associated with the provision of standard control services;</p>	<p>understanding of the enterprise data and its input into reporting activities.</p>
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services; or</p> <p>(ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services; and</p> <p>(iv) maintain the reliability and security of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> <li>• Business Intelligence Data and Reporting enhancements will support Power and Water to understand the key metrics and performance indicators that will deliver the value to the business. This supports the ability to make informed decisions relative to business and organisational planning; network design and implementation; energy demands, usage &amp; consumption patterns to ensure effective allocation of resources and investment to maintain the continued and efficient delivery of standard control services.</li> </ul>
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services</p>	<ul style="list-style-type: none"> <li>• The preferred option will indirectly support the safety of the distribution system through provision of better understanding of the risk trends across distribution systems and the effective use of resources to mitigate.</li> </ul>

## 6.6.3.4.3 Mapping to AER Capital Expenditure Criteria

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

<p>6.5.7(c)(1) <i>the efficient costs of achieving the capital expenditure</i></p>	<ul style="list-style-type: none"> <li>• The preferred option focuses on reducing the manual processes associated with the current reporting, reducing the reliance on external contracts to develop</li> </ul>
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## ICT Capital Expenditure Plan

<i>objectives;</i>	<p>BI and reporting capabilities, and increasing the quality of the reporting. The project will support the achievement of efficient cost to achieve reporting and business intelligence objectives.</p> <ul style="list-style-type: none"><li>• The system capital expenditure will be apportioned across the all of Power and Water’s lines of business, delivering cost efficiencies.</li></ul>
<i>6.5.7(c)(2) the costs that a prudent operator would require to achieve the capital expenditure objectives; and</i>	<ul style="list-style-type: none"><li>• The preferred option to re-engineer and upgrade the current BI systems support the delivery of the most effective solution, while also ensuring that the overall capital expenditure is comparable with other DNSP BI capital investments.</li></ul>
<i>6.5.7(c)(3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.</i>	<ul style="list-style-type: none"><li>• There is a realistic expectation that demand forecast is accurate across RCP1, due to Power and Water being the only DNSP currently, or planned, to operate in the Northern Territory.</li></ul>

### 6.6.3.4.4 Benefits of Preferred Option

The benefits of the preferred option are presented in the following table:

# ICT Capital Expenditure Plan



Tangible benefits	Intangible benefits
<p>[Redacted content]</p>	<ul style="list-style-type: none"><li>• Downstream efficiency gains through enhanced business reporting capabilities,</li><li>• Enhanced business reporting to enable fact based decision making,</li><li>• BI enhancements will support improved maturity data warehouse data, and</li><li>• Enhance the benefits delivered by the data as an enterprise asset project.</li></ul>

# ICT Capital Expenditure Plan



## 7 Attachments

- 7.1 Attachment 1: Forecast Expenditure Spreadsheet – CAM Allocation to Power Networks



# PWC ICT Expenditure Plan - RCP1

Cost Allocation - Percentage to Power Networks = 56.2%

Classification	Business Area	ICT Program	Stream	Allocation to PN	Total Cost	Total ICT Program Cost - NOT ALLOCATED (Dollars in Thousands)						Outside RCP	Total Cost	Total ICT Program Cost - ALLOCATED (Dollars in Thousands)						Outside RCP
						Within RCP								Within RCP						
						Total in RCP	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24			Total in RCP	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	
Asset Extension	Enterprise	BI Re-engineering	Data and Reporting Program	56%	\$ 2,000	\$ 2,000	\$ 800	\$ 800	\$ 400			\$ -	\$ 1,124	\$ 1,124	\$ 450	\$ 450	\$ 225	\$ -	\$ -	\$ -
Asset Extension	Network Operations	Network Planning	System Planning Tools	100%	\$ 1,089	\$ 1,089	\$ 1,089					\$ -	\$ 1,089	\$ 1,089	\$ 1,089	\$ -	\$ -	\$ -	\$ -	\$ -
Asset Extension	Network Operations	RIN's	RIN Reporting	100%	\$ 500	\$ 500	\$ 500					\$ -	\$ 500	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Asset Extension - SUBTOTAL</b>						<b>\$ 3,589</b>	<b>\$ 1,889</b>	<b>\$ 1,300</b>	<b>\$ 400</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 2,713</b>	<b>\$ 1,539</b>	<b>\$ 950</b>	<b>\$ 225</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
Asset Replacement	Remediate the Core	Revenue	Retail Management System	56%	\$ 8,390	\$ 8,390	\$ 1,500	\$ 5,440	\$ 1,450			\$ -	\$ 4,715	\$ 4,715	\$ 843	\$ 3,057	\$ 815	\$ -	\$ -	\$ -
Asset Replacement	Remediate the Core	Finance Management System	Oracle Replacement / Reimplementation	56%	\$ 2,550	\$ 2,550	\$ 850	\$ 850	\$ 850			\$ -	\$ 1,433	\$ 1,433	\$ 478	\$ 478	\$ 478	\$ -	\$ -	\$ -
Asset Replacement	Remediate the Core	Maximo and ESRI Upgrade / Reimplementation	Maximo Reconfiguration and Upgrade	56%	\$ 9,175	\$ 8,175	\$ 2,725	\$ 2,725	\$ 2,725		\$ 1,000	\$ 5,156	\$ 4,594	\$ 1,531	\$ 1,531	\$ 1,531	\$ -	\$ -	\$ -	\$ 562
Asset Replacement	Remediate the Core		ESRI Decouple and Upgrade	56%	\$ 2,350	\$ 2,350	\$ 784	\$ 783	\$ 783		\$ -	\$ 1,321	\$ 1,321	\$ 441	\$ 440	\$ 440	\$ -	\$ -	\$ -	\$ -
Asset Replacement	Refresh	Refresh	Software & Hardware Refresh	56%	\$ 13,213	\$ 13,213	\$ 3,401	\$ 2,287	\$ 1,185	\$ 2,766	\$ 3,574	\$ -	\$ 7,426	\$ 7,426	\$ 1,911	\$ 1,285	\$ 666	\$ 1,554	\$ 2,009	\$ -
<b>Asset Replacement - SUBTOTAL</b>						<b>\$ 34,678</b>	<b>\$ 9,260</b>	<b>\$ 12,085</b>	<b>\$ 6,993</b>	<b>\$ 2,766</b>	<b>\$ 3,574</b>	<b>\$ 1,000</b>	<b>\$ 19,489</b>	<b>\$ 5,204</b>	<b>\$ 6,792</b>	<b>\$ 3,930</b>	<b>\$ 1,554</b>	<b>\$ 2,009</b>	<b>\$ 562</b>	<b>\$ -</b>
Capability Growth	Customer	CRM	Customer Relationship Management	56%	\$ 3,000	\$ 3,000			\$ 1,500	\$ 1,500	\$ -	\$ 1,686	\$ 1,686	\$ -	\$ -	\$ -	\$ 843	\$ 843	\$ -	\$ -
Capability Growth	Customer	MDM	Meter Data Management	56%	\$ 5,000	\$ 4,000	\$ 3,000	\$ 1,000			\$ 1,000	\$ 2,810	\$ 2,248	\$ 1,686	\$ 562	\$ -	\$ -	\$ -	\$ -	\$ 562
Capability Growth	Network Operations	Works Management	Scheduling	56%	\$ 1,000	\$ 1,000			\$ 800	\$ 200	\$ -	\$ 562	\$ 562	\$ -	\$ -	\$ -	\$ 450	\$ 112	\$ -	\$ -
Capability Growth	Network Operations		Mobility	56%	\$ 1,540	\$ 1,540		\$ 540	\$ 500	\$ 500	\$ -	\$ 865	\$ 865	\$ -	\$ -	\$ 303	\$ 281	\$ 281	\$ -	\$ -
Capability Growth	Network Operations		Investment Planning & Forecasting	100%	\$ 1,000	\$ 1,000		\$ 1,000			\$ -	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ 1,000	\$ -	\$ -	\$ -	\$ -
Capability Growth	Network Operations		Project Management System / Smartsheet	100%	\$ 500	\$ 500				\$ 500	\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
Capability Growth	Network Operations	Outage Management	Outage Management	56%	\$ 6,000	\$ 4,350	\$ 1,650	\$ 1,350	\$ 1,350		\$ 1,650	\$ 3,372	\$ 2,445	\$ 927	\$ 759	\$ 759	\$ -	\$ -	\$ -	\$ 927
Capability Growth	Network Operations	Network Business Management	Estimating & Quotation Management	100%	\$ 1,000	\$ 1,000			\$ 1,000		\$ -	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ -	\$ 1,000	\$ -	\$ -	\$ -
Capability Growth	Network Operations		Fleet Management	100%	\$ 500	\$ 500			\$ 500		\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ 500	\$ -	\$ -	\$ -
Capability Growth	Network Operations		Operational Risk Reporting	100%	\$ 500	\$ 500			\$ 500		\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -	\$ -
Capability Growth	Network Operations		Drawing Management System	100%	\$ 800	\$ 800		\$ 800			\$ -	\$ 800	\$ 800	\$ -	\$ -	\$ 800	\$ -	\$ -	\$ -	\$ -
Capability Growth	Network Operations		EBA Interpreter	100%	\$ 500	\$ 500				\$ 500	\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -	\$ -
Capability Growth	Network Operations	System Operations	CATS & B2B System	100%	\$ 1,000	\$ 1,000	\$ 1,000				\$ -	\$ 1,000	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Capability Growth - Subtotal</b>						<b>\$ 19,690</b>	<b>\$ 5,650</b>	<b>\$ 2,350</b>	<b>\$ 3,690</b>	<b>\$ 4,300</b>	<b>\$ 3,700</b>	<b>\$ 2,650</b>	<b>\$ 13,606</b>	<b>\$ 3,613</b>	<b>\$ 1,321</b>	<b>\$ 2,862</b>	<b>\$ 3,074</b>	<b>\$ 2,736</b>	<b>\$ 1,489</b>	<b>\$ -</b>
<b>GRAND TOTAL</b>						<b>\$ 57,957</b>	<b>\$ 16,799</b>	<b>\$ 15,735</b>	<b>\$ 11,083</b>	<b>\$ 7,066</b>	<b>\$ 7,274</b>	<b>\$ 3,650</b>	<b>\$ 35,808</b>	<b>\$ 10,356</b>	<b>\$ 9,062</b>	<b>\$ 7,017</b>	<b>\$ 4,628</b>	<b>\$ 4,745</b>	<b>\$ 2,051</b>	<b>\$ -</b>

Updated per email from Skev 21/12/17.



# PWC ICT Expenditure Plan - RCP1

Cost Allocation - Percentage to Power Networks = 56.2%

Classification	Business Area	ICT Program	Stream	Allocation to PN	Total ICT Program Cost - NOT ALLOCATED (Dollars in Thousands)							Total ICT Program Cost - ALLOCATED (Dollars in Thousands)								
					Total Cost	Within RCP					Outside RCP	Total Cost	Within RCP					Outside RCP		
						Total in RCP	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23			FY 2023/24	Total in RCP	FY 2019/20	FY 2020/21	FY 2021/22		FY 2022/23	FY 2023/24
Capability Growth	Customer	CRM	Customer Relationship Management	56%	\$ 3,000	\$ 3,000				\$ 1,500	\$ 1,500	\$ -	\$ 1,686	\$ 1,686	\$ -	\$ -	\$ -	\$ 843	\$ 843	\$ -
Capability Growth	Customer	MDM	Meter Data Management	56%	\$ 5,000	\$ 4,000	\$ 3,000	\$ 1,000				\$ 1,000	\$ 2,810	\$ 2,248	\$ 1,686	\$ 562	\$ -	\$ -	\$ -	\$ 562
<b>TOTAL CUSTOMER</b>					<b>\$ 8,000</b>	<b>\$ 7,000</b>	<b>\$ 3,000</b>	<b>\$ 1,000</b>		<b>\$ 1,500</b>	<b>\$ 1,500</b>	<b>\$ 1,000</b>	<b>\$ 4,496</b>	<b>\$ 3,934</b>	<b>\$ 1,686</b>	<b>\$ 562</b>	<b>\$ -</b>	<b>\$ 843</b>	<b>\$ 843</b>	<b>\$ 562</b>

Asset Extension	Enterprise	BI Re-engineering	Data and Reporting Program	56%	\$ 2,000	\$ 2,000	\$ 800	\$ 800	\$ 400			\$ -	\$ 1,124	\$ 1,124	\$ 450	\$ 450	\$ 225	\$ -	\$ -	\$ -
<b>TOTAL ENTERPRISE</b>					<b>\$ 2,000</b>	<b>\$ 2,000</b>	<b>\$ 800</b>	<b>\$ 800</b>	<b>\$ 400</b>			<b>\$ -</b>	<b>\$ 1,124</b>	<b>\$ 1,124</b>	<b>\$ 450</b>	<b>\$ 450</b>	<b>\$ 225</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

Asset Extension	Network Operations	Network Planning	System Planning Tools	100%	\$ 1,089	\$ 1,089	\$ 1,089					\$ -	\$ 1,089	\$ 1,089	\$ 1,089	\$ -	\$ -	\$ -	\$ -	\$ -
Asset Extension	Network Operations	RIN's	RIN Reporting	100%	\$ 500	\$ 500		\$ 500				\$ -	\$ 500	\$ 500	\$ -	\$ 500	\$ -	\$ -	\$ -	\$ -
Capability Growth	Network Operations	Works Management	Scheduling	56%	\$ 1,000	\$ 1,000				\$ 800	\$ 200	\$ -	\$ 562	\$ 562	\$ -	\$ -	\$ -	\$ 450	\$ 112	\$ -
Capability Growth	Network Operations		Mobility	56%	\$ 1,540	\$ 1,540			\$ 540	\$ 500	\$ 500	\$ -	\$ 865	\$ 865	\$ -	\$ -	\$ 303	\$ 281	\$ 281	\$ -
Capability Growth	Network Operations		Investment Planning & Forecasting	100%	\$ 1,000	\$ 1,000		\$ 1,000				\$ -	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ 1,000	\$ -	\$ -	\$ -
Capability Growth	Network Operations		Project Management System / Smartsheet	100%	\$ 500	\$ 500				\$ 500	\$ -	\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
Capability Growth	Network Operations	Outage Management	Outage Management	56%	\$ 6,000	\$ 4,350	\$ 1,650	\$ 1,350	\$ 1,350			\$ 1,650	\$ 3,372	\$ 2,445	\$ 927	\$ 759	\$ 759	\$ -	\$ -	\$ 927
Capability Growth	Network Operations	Network Business Management	Estimating & Quotation Management	100%	\$ 1,000	\$ 1,000				\$ 1,000		\$ -	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ -	\$ 1,000	\$ -	\$ -
Capability Growth	Network Operations		Fleet Management	100%	\$ 500	\$ 500				\$ 500		\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ 500	\$ -	\$ -
Capability Growth	Network Operations		Operational Risk Reporting	100%	\$ 500	\$ 500				\$ 500		\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
Capability Growth	Network Operations		Drawing Management System	100%	\$ 800	\$ 800		\$ 800				\$ -	\$ 800	\$ 800	\$ -	\$ -	\$ 800	\$ -	\$ -	\$ -
Capability Growth	Network Operations		EBA Interpreter	100%	\$ 500	\$ 500				\$ 500		\$ -	\$ 500	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
Capability Growth	Network Operations	System Operations	CATS & B2B System	100%	\$ 1,000	\$ 1,000	\$ 1,000					\$ -	\$ 1,000	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL NETWORK OPERATIONS</b>					<b>\$ 15,929</b>	<b>\$ 14,279</b>	<b>\$ 3,739</b>	<b>\$ 1,850</b>	<b>\$ 3,690</b>	<b>\$ 2,800</b>	<b>\$ 2,200</b>	<b>\$ 1,650</b>	<b>\$ 12,188</b>	<b>\$ 11,261</b>	<b>\$ 3,016</b>	<b>\$ 1,259</b>	<b>\$ 2,862</b>	<b>\$ 2,231</b>	<b>\$ 1,893</b>	<b>\$ 927</b>

Asset Replacement	Refresh	Refresh	Software	56%	\$ 4,659	\$ 4,659	\$ 375	\$ 1,297	\$ 425	\$ 1,590	\$ 972		\$ 2,618	\$ 2,618	\$ 211	\$ 729	\$ 239	\$ 894	\$ 546
			Hardware	56%	\$ 8,554	\$ 8,554	\$ 3,026	\$ 990	\$ 760	\$ 1,176	\$ 2,602		\$ 4,807	\$ 4,807	\$ 1,701	\$ 556	\$ 427	\$ 661	\$ 1,462
<b>TOTAL REFRESH</b>					<b>\$ 13,213</b>	<b>\$ 13,213</b>	<b>\$ 3,401</b>	<b>\$ 2,287</b>	<b>\$ 1,185</b>	<b>\$ 2,766</b>	<b>\$ 3,574</b>	<b>\$ -</b>	<b>\$ 2,618</b>	<b>\$ 7,426</b>	<b>\$ 1,911</b>	<b>\$ 1,285</b>	<b>\$ 666</b>	<b>\$ 1,554</b>	<b>\$ 2,009</b>

Asset Replacement	Remediate the Core	Revenue	Retail Management System	56%	\$ 8,390	\$ 8,390	\$ 1,500	\$ 5,440	\$ 1,450			\$ -	\$ 4,715	\$ 4,715	\$ 843	\$ 3,057	\$ 815	\$ -	\$ -
Asset Replacement	Remediate the Core	Finance Management System	Oracle Replacement / Reimplementation	56%	\$ 2,550	\$ 2,550	\$ 850	\$ 850	\$ 850			\$ -	\$ 1,433	\$ 1,433	\$ 478	\$ 478	\$ 478	\$ -	\$ -
Asset Replacement	Remediate the Core	Maximo and ESRI Upgrade / Reimplementation	Maximo Reconfiguration and Upgrade	56%	\$ 9,175	\$ 8,175	\$ 2,725	\$ 2,725	\$ 2,725		\$ 1,000	\$ 5,156	\$ 4,594	\$ 1,531	\$ 1,531	\$ 1,531	\$ -	\$ -	\$ 562
Asset Replacement	Remediate the Core		ESRI Decouple and Upgrade	56%	\$ 2,350	\$ 2,350	\$ 784	\$ 783	\$ 783		\$ -	\$ 1,321	\$ 1,321	\$ 441	\$ 440	\$ 440	\$ -	\$ -	\$ -
<b>TOTAL REMEDIATE THE CORE</b>					<b>\$ 22,465</b>	<b>\$ 21,465</b>	<b>\$ 5,859</b>	<b>\$ 9,798</b>	<b>\$ 5,808</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,000</b>	<b>\$ 12,625</b>	<b>\$ 12,063</b>	<b>\$ 3,293</b>	<b>\$ 5,506</b>	<b>\$ 3,264</b>	<b>\$ -</b>	<b>\$ -</b>

GRAND TOTAL

**\$ 57,957 \$ 16,799 \$ 15,735 \$ 11,083 \$ 7,066 \$ 7,274 \$ 3,650**

**\$ 35,808 \$ 10,356 \$ 9,062 \$ 7,017 \$ 4,628 \$ 4,745 \$ 2,051**



**Excerpt from email forwarded by John Rearden on 31 August 2017:**

Morning John,

Please see table below for FTE report as requested.

The data doesn't include T-Gen or Jacana and is based on end of June 2011 to 2017.

Let me know if you have any questions.

Business Units	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Corporate	293.43	297	283.67	290.88	293.98	270.26	245.64
Power Networks	301.72	316.85	315	321.38	344.65	353.91	363.65
Regions and Remote	93.94	98.91	105.53	89	103.04	102	109.8
System Control	27.5	27	36.89	33.94	39	45.5	44.55
Water Services	139.01	158.52	167.54	163.64	164.44	176.56	173.6
<b>Total</b>	<b>855.6</b>	<b>898.28</b>	<b>908.63</b>	<b>898.84</b>	<b>945.11</b>	<b>948.23</b>	<b>937.24</b>

Per discussions with John Rearden and Andrew Knowles, CAM will be calculated as follow:

**CAM = Number of Power Networks Staff / Sum of Staff in Power Networks, Regions and Remotes and Water Services**

**NOTES:**

Staff in Corporate and System Control are shared between operating groups and therefore are excluded from the calculation.

Number of staff in Gas is considered insignificant .

The CAM calculated for 2017 will be used for subsequent years as no better data is available.

CAM Calculation based on this formula:

Business Units	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Power Networks	301.72	316.85	315	321.38	344.65	353.91	363.65
Regions and Remote	93.94	98.91	105.53	89	103.04	102	109.8
Water Services	139.01	158.52	167.54	163.64	164.44	176.56	173.6
<b>Total</b>	<b>534.67</b>	<b>574.28</b>	<b>588.07</b>	<b>574.02</b>	<b>612.13</b>	<b>632.47</b>	<b>647.05</b>

<b>CAM</b>	<b>56.4%</b>	<b>55.2%</b>	<b>53.6%</b>	<b>56.0%</b>	<b>56.3%</b>	<b>56.0%</b>	<b>56.2%</b>
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