



Supporting  
document 5.33

# Client Devices Refresh Business Case

2020-2025  
Regulatory Proposal  
January 2019





SA Power Networks

# Client Devices Refresh Business Case



IT regulatory submission for the 2020–2025 Regulatory Control Period

January 2019

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## 1 Executive summary

Topic	Client Devices
<b>Category of expenditure</b>	Recurrent non-network information technology (IT) capital expenditure ( <b>capex</b> )
<b>Context/ background</b>	<p>“Client devices” enable SA Power Networks to deliver customer and network services efficiently and safely. These devices include desktops, laptops, mobile devices (phones, tablets) and meeting room equipment. They enable our workforce to respond to customer and network issues; receive job information in the field; access critical asset and service information; update customers with timely information on progress; and play a critical role in keeping our workforce safe in a diverse and challenging environment. They also facilitate efficient collaboration between workers located at different sites.</p> <p>We keep devices current, operational and fit for purpose with a rolling refresh program that focuses on:</p> <ul style="list-style-type: none"> <li>• prudent replacement of end-of-life hardware and software;</li> <li>• timely deployment/handover of new or replaced computing devices;</li> <li>• timely upgrades to device management and support tools; and</li> <li>• ongoing governance on the devices that maintain business performance.</li> </ul> <p>These devices typically have a recommended five-year life, but we look to defer replacement where efficient.</p>
<b>Drivers</b>	<p>Key drivers for this business case (Section 2 - Drivers):</p> <ul style="list-style-type: none"> <li>• Continue the efficient delivery of energy services: <ul style="list-style-type: none"> <li>– Allow field workers to access/enter up-to date assets and work and customer information.</li> <li>– Facilitate efficient collaboration between workers located at different sites.</li> <li>– Enable our organisation to function.</li> </ul> </li> <li>• Manage risks associated with ageing client devices: <ul style="list-style-type: none"> <li>– ensuring the client device fleet remains reliable, operational and fit for purpose while managing costs in a prudent manner</li> <li>– managing client devices fleet numbers while retaining the ability to respond to changing business requirements</li> <li>– managing cybersecurity risks posed by client devices.</li> </ul> </li> </ul>
<b>Options considered</b>	<p>Section 4 outlines the options investigated for addressing the efficient and prudent replacement of end of life client devices.</p> <p>Four options were considered:</p> <ul style="list-style-type: none"> <li>• <b>Option 0: Replace when unusable</b> Replaces devices when they are no longer usable. SA Power Networks would be exposed to a ‘High’ level of business risk, especially in financial and organisational impact domains through lost productivity and workers unable to perform their roles.</li> <li>• <b>Option 1: Industry standard refresh</b> Uses vendor and industry standard device refresh cycles as the baseline for refresh eg 2 years for smart phones, 2 years for laptops and 4.5 years for</li> </ul>

Topic	Client Devices
	<p>desktops. Enables the lowest risk to maintain the network and highest level of responsiveness to customers. Has the lowest overall risk profile.</p> <ul style="list-style-type: none"> <li>• <b>Option 2: Business as usual</b> In-line with Supporting Document 5.34 - IT Asset Management Plan (<b>IT Asset Management Plan</b>) uses SA Power Networks ‘business as usual’ device refresh cycles<sup>1</sup> as the baseline for refresh eg 2.5 years for smart phones, 4 years for laptops and 5 years for desktops.</li> <li>• <b>Option 3: Role Based Refresh</b> Extends some device refresh cycles further adopting an increased, but still acceptable level of risk eg stretches smart phones to a three-year lifecycle. Rationalises the device fleet based on defined user roles.</li> </ul>
<b>Option selected</b>	<p>Option 3 was selected through the assessment process and related cost benefit analysis for each option (Section 4 - Options assessment).</p> <p>Option 3:</p> <ul style="list-style-type: none"> <li>• adopts a role-based approach to ensure our employees have appropriate devices to remain productive and can deliver efficient energy services through mobility and collaboration technologies;</li> <li>• maximises our client device life and presents an acceptable level of risk; and</li> <li>• minimises the costs of our client device fleet by being the most efficient option for refresh.</li> </ul>
<b>Estimated cost</b>	<p>The forecast capital expenditure for Option 3 for the 2020-2025 Regulatory Control Period (<b>RCP</b>) is <b>\$23.2 million</b> (Dec \$2017)<sup>2</sup>.</p> <p>This is an 11% reduction from the 2015-20 RCP actuals/estimate of \$26.2 million.</p>
<b>Estimated benefits</b>	<ul style="list-style-type: none"> <li>• Ensures that devices are operational, secure and fit for purpose to maintain energy service levels to customers.</li> <li>• Reduces the risks of organisational impact and increased costs and adverse customer impacts due to minimising: <ul style="list-style-type: none"> <li>– operational support needs;</li> <li>– downtime associated with replacing devices only when they become unusable.</li> </ul> </li> <li>• Delivers the lowest total expenditure for the 2020-25 RCP.</li> <li>• Maintains reliable mobility functionality benefits described in Context/Drivers sections.</li> </ul>

<sup>1</sup> Refresh cycles typically vary from vendor/industry replacement cycles to balance performance, risk and cost

<sup>2</sup> Unless otherwise specified, all costs in this business case are expressed in December 2017 dollars and exclude corporate overheads

Topic	Client Devices
<b>Risks of not proceeding</b>	<p>The overall risk of not proceeding has been identified to be <b>High</b>.</p> <p>Not proceeding with the client devices refresh increases the risks of:</p> <ul style="list-style-type: none"> <li>• faults, instability and reduced performance of devices directly impacting on our ability to manage our network and deliver energy services for our customers.</li> <li>• cybersecurity breaches and information loss when devices are not capable of handling the latest security requirements;</li> <li>• lack of support from suppliers when devices fail past their end of life; and</li> <li>• increased complexity and costs to maintain the device fleet.</li> </ul> <p>These specific risks could adversely impact the following corporate risks:</p> <ul style="list-style-type: none"> <li># 1: Injury or death of our workers, contractors, or the public</li> <li># 2: A bushfire event caused by SA Power Networks assets, workers or operations</li> <li># 5: Failure to meet the financial objectives of the business ...</li> <li># 6: Fraud committed via misappropriation of assets or other benefit</li> <li># 8: Failure to comply with regulatory obligations</li> <li># 9: Major loss of supply through ineffective operations, asset management or external factors</li> <li># 11: Lack of appropriate or effective IT systems and processes to support the business</li> </ul> <p>Section 2.3 – Issues and risks associated with not proceeding has further detail on the risk assessment and the benefits associated with reducing the identified risks.</p>
<b>Regulatory framework</b>	<p>Given that reliable client devices are critical to the effective operation and maintenance of the electricity network and management of network outages, this project will support the achievement of expenditure objectives by enabling users to access information to deliver works and services which:</p> <ul style="list-style-type: none"> <li>• meet or manage the expected demand for standard control services over the 2020-25 RCP;</li> <li>• ensure we meet all applicable regulatory obligations or requirements associated with the provision of standard control services;</li> <li>• maintain the quality, reliability and security of supply of standard control services; and</li> <li>• maintain the reliability and security of the distribution system.</li> </ul> <p>This ongoing replacement program also reflects the expenditure criteria by:</p> <ul style="list-style-type: none"> <li>• improving the efficiency and effectiveness of the operation and management of the network and delivery of network services to customers;</li> <li>• helping to minimise operational costs;</li> <li>• adopting processes which are prudent and consistent with good electricity industry practice; and</li> <li>• reflecting a realistic expectation of efficient cost inputs.</li> </ul>
<b>Supporting evidence</b>	<p>The forecast expenditure for the 2020-25 RCP was developed using historic device refresh labour costs, vendor device and deployment costs, and updated forecasts by asset type. The device fleet has been rationalised to reflect usage for all options and rationalised further for the recommended option to reflect moving to</p>

Topic	Client Devices
	a role-based approach to devices provided to end users. See Section 5 - Supporting evidence.
<b>Customer and stakeholder engagement</b>	We presented our initial calculations for device refresh costs to the customer consultative panel and reference groups at an IT Deep Dive workshop in June 2018 (see Supporting Document 0.15 - Think Human IT Deep Dive Workshop Report). The workshop indicated interest in understanding the correlation between our work force strategy and our device numbers which are outlined in this business case under Section 5.6 - Device fleet explanation.

## 2 Drivers

### 2.1 Enabling management of a large diverse electricity network

Our client devices enable our workforce to manage a large, geographically dispersed and diverse electricity network. Our devices enable 1,800 staff, and almost 1000 external service providers, to manage a network covering 178,000 km<sup>2</sup> across 458 sites, including 42 offices and depots, and 416 substations (Figure 1).

The majority of our workforce are mobile and work in challenging, often remote, environmental conditions. Their devices are not just for receiving and sending work and activity related updates, but also for sourcing critical safety information required to do the job. They are part of a worker’s essential safety equipment. Our client devices need to be ‘fit for purpose’, secure and reliable to help keep our people safe and our customers informed, even under extreme conditions such as bush fire relate outages. They also need to be cost-effective.

Our prudent refresh program proactively replaces ‘end-of-life’ client devices to ensure they are available and functional for our workforce and continue to enable our customer and network services.

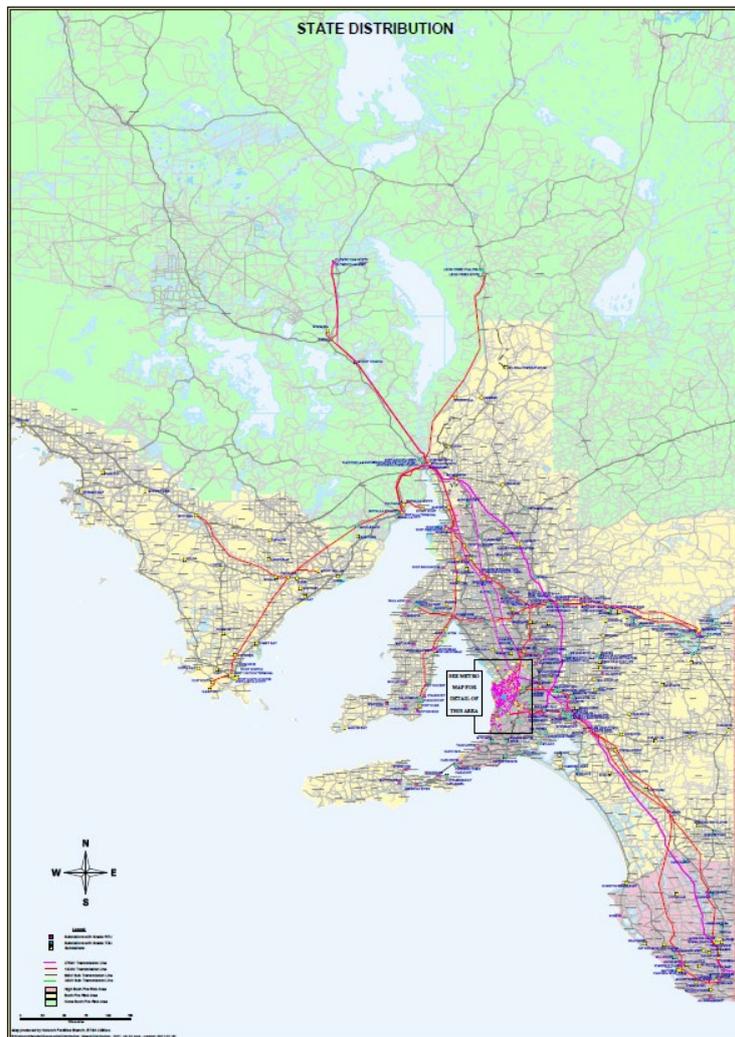


Figure 1: A diverse distribution network

## 2.2 Increasing reliance on technology and client devices

In our 2015–2020 Regulatory Proposal, our strategic direction was to use technology to improve management of our network while maintaining cost levels. We have had a strong focus on using mobility solutions that leverage digital technologies for supporting all aspects of field and customer related work. This enables field crews to operate more effectively and safely during outages, when maintaining and building the distribution network and giving customers timely and accurate updates and information.

In the 2015–20 Regulatory Control Period (**RCP**), we are also deploying basic digital collaboration to support both co-located and geographically dispersed teams and delivering a consistent, well-maintained, secure meeting room and teleconferencing capability across offices and depots. Ensuring the continued reliability and functionality of this now-deployed capability will continue as an outcome of this business case.

Refresh life cycles for each type of client device have been analysed and documented in our IT Asset Management Plan based on:

- risk mitigation (cybersecurity, risk of hardware failure, cost of unplanned break–fix replacements);
- industry recommendations for useful life of the device;
- support arrangements;
- historical reliability; and
- ensuring the business can remain responsive to customers and maintain the network efficiently.

## 2.3 Issues and risks associated with not proceeding

### Current State

The number of devices grew during the current period as we made more strategic use of technology, especially mobility solutions, especially in response to increased customer demand for more accurate and timely information during outages. Current projections, based on business as usual device replacements, are that the number of devices will have increased by around 30%<sup>3</sup> from the start of the 2015-20 RCP through to the end of the 2015-20 RCP. We now need to maximise life, whilst managing their service risk, and minimise cost of these assets. Our approach to device management — reviewing capability needs, device capabilities, review cycles, and costs to prudently meet business needs — is defined in our IT Asset Management Plan and supported by the rolling plan for replacement outlined in this business case to minimise costs and spread costs across years.

In addition, the mix of our device fleet has grown organically during the period and may not be fit-for-purpose to support the operating environment during the 2020-25 RCP. Customer expectations for timely information and technology capability, are likely to drive further shifts of our device fleet to support greater mobility. Considerations for device fleet changes will need to be balanced with a prudent management of expenditure whilst ensuring we maintain the capability to leverage technology advances.

### Operational Risks

Given the criticality of the client devices at SA Power Networks, if no upgrade activity occurred, SA Power Networks may not be able to meet its regulatory obligations to deliver safe and reliable energy services to South Australian customers.

The following operational risk assessment has been conducted in accordance with SA Power Networks' Corporate Risk Framework (refer Appendix B). This includes the application of the appropriate qualitative measures of likelihood and consequence, and the resulting overall risk rating. The following risks are assessed against 'Not Proceeding' with any planned activity in respect of the Client Devices replacement.

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<sup>3</sup> Based on RIN reports 2015 – 2018 and extrapolating to 2020.

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
1	Reliability	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to individuals within the business losing capability to manage the electricity network resulting in:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network faults</li> <li>• untimely updates to configuration management systems</li> <li>• increased frequency and duration of network outages for customers</li> <li>• unable to access systems to manage the network</li> </ul>	Almost Certain	Minor	High
2	Financial	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>• reductions in business productivity due to high reliance on devices all business functions, resulting in increased expenditure and/or reduction in service to customers</li> <li>• higher IT operational expenditure to resolve failures/issues and manage more complex (older and more varied) device fleet</li> <li>• cybersecurity breaches (see Reputation below) resulting in significant litigation/punitive damages and legal costs</li> </ul> <p>Each worker suffering an average of 10 mins lost time/day due to device issues adds to more than \$7 million in lost productivity across a year<sup>4</sup></p>	Almost Certain	Moderate	High
3	Health and safety	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network status that has the potential to cause a bushfire and/or injury or death to workers, contractors, public</li> <li>• field workers not having access to safety critical and/or configuration management information before they start work on a site (e.g. whether a section is energised or not, cable locations, site safety plans)</li> <li>• difficulty in tracking and contacting field workers cannot in remote locations</li> </ul>	Unlikely	Catastrophic	High

<sup>4</sup> Assuming 2500 people working 7.5hr days at average cost of \$80/hour

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
4	Reputation/ Customer service	<p>Client devices that become insecure or unsupported by the vendor could be open to increased cybersecurity incidents resulting in:</p> <ul style="list-style-type: none"> <li>our organisations', and customers', private data network security being compromised</li> <li>significant litigation/punitive damages, legal costs and major loss of management time</li> </ul> <p>NB: Aged hardware inhibits our ability to maintain and apply updates/security patches on devices</p>	Likely	Major	High
5	Regulatory	<p>Client devices that become insecure or unsupported by the vendor could:</p> <ul style="list-style-type: none"> <li>be non-compliant with regulatory requirements for supply availability and cost containment</li> <li>breach cybersecurity and privacy legislation</li> </ul> <p>NB: Aged hardware inhibits ability to maintain and apply updates/security patches on devices</p>	Likely	Major	High
6	Organisational	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>more individuals unable to perform their role for a longer time until appropriate alternative devices are provided and/or their device issues are resolved</li> <li>device failure can result in rework by users even after a device is fixed</li> <li>not using IT services due to loss of confidence in technology resulting in loss of benefits previously delivered</li> <li>higher staff turnover due to frustrations with substandard equipment and consequent inability to work efficiently and effectively</li> </ul>	Almost Certain	Moderate	High

Risk Summary	
The overall risk rating for not proceeding with this program has been determined to be:	High

## 2.4 Detailed description of drivers

### 2.4.1 Continue the efficient delivery of energy services

With our increasingly connected and mobile workforce, the demand for reliable devices to support access to our information technology (IT) capability systems has never been greater. When devices fail or perform poorly, this impacts on our ability to maintain our network and deliver energy services to customers.

Our organisation's responsiveness to customers now critically depends on these devices remaining operational, secure and fit for purpose. This is only possible with devices that reliably perform that function. For example, field workers utilise tough devices for entering timely and accurate data on restoration and close out times that are used to inform customers and other staff use client devices to access systems that enable us to interact with customers, schedule work and analyse network asset risk.

Ongoing analysis and governance are required to ensure our device strategy continues to support business capability needs. We need to further enable our mobility as our users spend more time in the field or collaborating away from their desks, and take further advantages of technology improvements, e.g. the use of touchscreen devices for marking-up engineering drawings from the field.

### 2.4.2 Manage risk associated with ageing client devices

As devices age, reliability and performance decrease, and the consequences could be higher maintenance costs, additional support staff, difficulty embedding work activities reliant on devices, and increased downtime.

Client devices typically have short useful lives<sup>5</sup>, this is compounded by operating in particularly hot, dry and dusty environments often experienced in maintaining the electricity network in South Australia. As such, most devices are likely to be replaced at least once every RCP. Fixing hardware failures becomes more expensive, particularly in regional areas, and takes longer than active planned replacement, due to increased difficulty sourcing replacements for end-of-life hardware and the need to make multiple, unplanned, trips to fix/replace devices.

As business needs evolve, only prudent management of device type and specifications will ensure the business has all required capabilities without unnecessarily increasing the number of devices nor overspending on unnecessary performance. For example, to meet mobility needs during the current period the best available technology was to uplift a roll-out of phones, tough devices and tablets. With the growing emergence of converged devices<sup>6</sup>, there may now be more prudent options for meeting business needs.

Ongoing analysis and management are required to ensure the client device fleet remains fit for purpose while managing costs in prudent manner.

In addition to the service risks and ensure devices are fit for purpose, the risks of cybersecurity require devices to be kept current to support the latest updates and provide sufficient performance to meet software and operating system needs.

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<sup>5</sup> 2 to 5 years

<sup>6</sup> A device that replaces the use of multiple devices which users can carry with them to support their needs, eg newer laptops which may the use of traditional desktops and separate tablet device.

## 3 Scope

### 3.1 In-scope

This business case covers the execution of the rolling refresh program for client devices, inclusive of mobility and collaboration technologies and deployment labour costs. Table 1 outlines the client devices covered by refresh activities in this business case.

**Table 1: Client devices for refresh activities**

Client device type	High level use case
 Desktops	<ul style="list-style-type: none"> <li>Provisioned for users who work from a single site or require additional computing power to run dedicated software (eg Computer Aided Design (<b>CAD</b>))</li> </ul>
 Laptops	<ul style="list-style-type: none"> <li>Provisioned to enable office-based mobility where users need to work from multiple sites or additional computing power is required to run software (eg CAD)</li> <li>Specialised 'Tool of Trade' devices also provisioned for working with monitoring and control devices on electrical network</li> </ul>
 Monitors	<ul style="list-style-type: none"> <li>Provisioned for use with laptops and desktops</li> </ul>
 Tough devices	<ul style="list-style-type: none"> <li>Provisioned for field workers due to their operating environment driving higher reliability needs. Used in the field, in-vehicle or workshops</li> </ul>
 Smart devices	<ul style="list-style-type: none"> <li>Provisioned as a supplemental device to enable mobility for a fixed site office worker</li> <li>Provisioned to field workers where a tough device is not required</li> <li>Includes tablets and phones</li> </ul>
 Video and tele conferencing devices	<ul style="list-style-type: none"> <li>Large displays (eg televisions) used in meeting rooms and as digital displays and signage</li> <li>Projectors in meeting rooms (or for mobile use)</li> <li>Audio and video conferencing capabilities installed in meeting rooms</li> <li>Large monitors for use in places such as the Network Operations Centre</li> </ul>
 Meter reading devices	<ul style="list-style-type: none"> <li>Devices used by meter readers used to collect and report meter reading at customer properties</li> </ul>
 Plotters	<ul style="list-style-type: none"> <li>Large format printers used to print design drawings</li> </ul>
 Peripherals	<ul style="list-style-type: none"> <li>Annual fund for replacement of any required peripherals used in conjunction with the above devices (eg mice, keyboards)</li> </ul>

## 3.2 Out of scope

Explicitly out of scope of this business case are:

- operating expenditure related to maintaining and supporting client devices including:
  - support costs for client devices
  - costs for patching and maintaining applications on devices (including operating systems);
- refresh of printers, which are covered by a service arrangement with a supplier;
- device costs for enabling new business capability, which are covered within estimates for projects that deliver such new capability;
- costs for docking units and communication capability from vehicles, which are met as part of the vehicle fit out; and
- refresh of mobile pagers as their use has been mostly replaced with smart phones.

## 4 Options assessment

### 4.1 Options considered

The options for this business case are aligned to our IT Asset Management Plan. We have considered key factors such as:

- cost of devices;
- size, and makeup, of the device fleet to refresh;
- capabilities required by device users to enable the efficient delivery of electricity services;
- life cycles of each asset class; and
- labour cost assumptions.

Table 2 outlines the options assessed.

**Table 2: Options assessed**

Option	Description
<b>Option 0: Replace when unusable</b>	Replaces devices only when they become unusable
<b>Option 1: Industry Standard refresh</b>	Proactively plan device replacements before they become unusable based on useful life recommendations from the industry and vendors
<b>Option 2: Business as usual</b>	Proactively replaces devices issued in the organisation according to our current approach for our ongoing, rolling program. Plans device replacement based on useful life typically longer than industry and vendor recommendations based on our own experience with balancing cost and risk within our environment
<b>Option 3: Role Based Refresh</b>	Implements and governs device usage through a matrix that aligns device requirements for users based on their role in the organisation Prudently rationalises the device fleet size and mix Stretches useful-life assumptions to acceptable levels of risk to minimise refresh costs

High-level details for each option are outlined below. Detailed assumptions, costs and risks for each option are available in the cost models in Appendix A: Cost Models.

#### 4.1.1 Option 0: Replace when unusable

This option replaces client devices only when they become unusable. A device is considered unusable when:

- it is physically broken and unable to be repaired for use;
- cybersecurity patches are no longer produced by the vendor (driver patching);
- cybersecurity patches can no longer be applied to the device (operating system patching); or
- performance/capability doesn't support business needs:
  - eg hardware can't support business applications or operating systems.

This option captures the risk of not keeping our client devices **proactively** refreshed and current. The following assumptions were used to financially model this option:

- Devices will begin to become unusable and begin to be replaced after the end of their useful life (using a 'cost-constrained'<sup>7</sup> view of useful life).
  - Devices will become unusable and be replaced in a linear fashion with all devices purchased at the same time of the same asset type replaced after a time period equal to another half of their useful life (rounded up). This is depicted in Figure 2: Device replacement example for 100 devices with a 4-year useful life below. For example:
    - > 33% of a desktop fleet with a useful life of 6 years will be replaced in years 7, 8 and 9; and
    - > 50% of a laptop fleet with a useful life of 4 years will be replaced in years 5 and 6.
- Labour and service costs would double historic proactive replacement costs. This is a conservative estimate of the additional management and work required to reactively replace devices identified as unusable because of:
  - expected repeat visits to sites to replace a subset of unusable assets (assuming two visits as opposed to one planned visit, but could be significantly more); and
  - much more management and analysis required to coordinate replacements across multiple locations at a time.

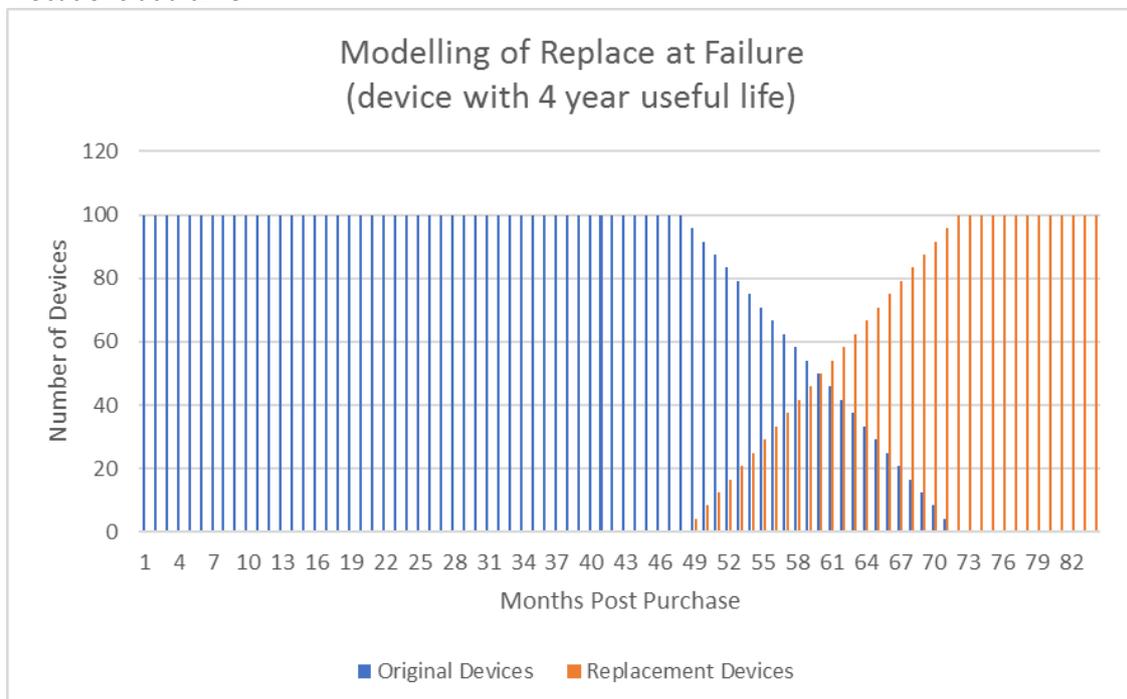


Figure 2: Device replacement example for 100 devices with a 4-year useful life

<sup>7</sup> Refer to our Supporting Document 5.34 - IT Asset Management Plan and Gartner's industry advice on cost-constrained views of useful life at an asset class level ([www.gartner.com/doc/3871479/use-recommended-life-spans-guide](http://www.gartner.com/doc/3871479/use-recommended-life-spans-guide) <https://www.gartner.com/doc/3871479/use-recommended-life-spans-guide>)

#### 4.1.1.1 Costs

This option requires the expenditure shown in Table 3, a total of **\$27.114 million** (Dec \$2017) of capex for the 2020-25 RCP.

**Table 3: Capital expenditure required for Option 0, \$million (Dec \$2017)**

Cost Type	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total 2020/21 - 2024/25
Capex	4.052	5.795	5.613	5.288	6.365	27.114
<b>TOTAL COST</b>	<b>4.052</b>	<b>5.795</b>	<b>5.613</b>	<b>5.288</b>	<b>6.365</b>	<b>27.114</b>

#### 4.1.1.2 Advantages

- Maximises client device life
- Defers replacement expenditure

#### 4.1.1.3 Disadvantages

- Impacts the efficient delivery of electricity services by stretching performance of devices and lengthening device replacement time for users
- Increased labour and service costs, and likely need to keep more spares than may be used, do not minimise the costs of refreshing the device fleet
- Increased operational costs due to higher number of device incidents and complexity of managing multiple versions of devices
- Less opportunity to receive bulk purchase discounting of a pro-active approach
- SA Power Networks exposed to significant health and safety, reputation/customer service and financial regulatory risk
- Unacceptable increase to cybersecurity risk as devices no longer able to receive security patches will be exposed until they are replaced

#### 4.1.1.4 Risks

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
1	Reliability	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to individuals within the business losing capability to manage the electricity network resulting in:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network faults</li> <li>• untimely updates to configuration management systems</li> <li>• increased frequency and duration of network outages for customers</li> </ul>	Possible	Moderate	Medium

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
2	Financial	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>reductions in business productivity due to high reliance on devices all business functions, resulting in increased expenditure and/or reduction in service to customers</li> <li>higher IT operational expenditure to resolve failures/issues and manage more complex (older and more varied) device fleet</li> <li>cybersecurity breaches (see Reputation below) resulting in significant litigation/punitive damages and legal costs</li> </ul> <p>Each worker suffering an average of 10 mins lost time/day due to device issues adds to more than \$7 million in lost productivity across a year<sup>8</sup></p>	Almost Certain	Moderate	High
3	Health and safety	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to:</p> <ul style="list-style-type: none"> <li>untimely detection and correction of network status that has the potential to cause a bushfire and/or injury or death to workers, contractors, public</li> <li>field workers not having access to safety critical and/or configuration management information before they start work on a site (e.g. whether a section is energised or not, cable locations, site safety plans)</li> <li>difficulty in tracking and contacting field workers cannot in remote locations</li> </ul>	Unlikely	Catastrophic	High
4	Reputation/ Customer service	<p>Client devices that become insecure or unsupported by the vendor could be open to increased cybersecurity incidents resulting in:</p> <ul style="list-style-type: none"> <li>our organisations', and customers', private data network security being compromised</li> <li>significant litigation/punitive damages, legal costs and major loss of management time</li> </ul> <p>NB: Aged hardware inhibits our ability to maintain and apply updates/security patches on devices</p>	Likely	Major	High

<sup>8</sup> Assuming 2500 people working 7.5hr days at average cost of \$80/hour

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
5	Regulatory	<p>Client devices that become insecure or unsupported by the vendor could:</p> <ul style="list-style-type: none"> <li>be non-compliant with regulatory requirements for supply availability and cost containment</li> <li>breach cybersecurity and privacy legislation</li> </ul> <p>NB: Aged hardware inhibits ability to maintain and apply updates/security patches on devices</p>	Likely	Major	High
6	Organisational	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>more individuals unable to perform their role for a longer time until appropriate alternative devices are provided and/or their device issues are resolved</li> <li>device failure can result in rework by users even after a device is fixed</li> <li>not using IT services due to loss of confidence in technology resulting in loss of benefits previously delivered</li> <li>higher staff turnover due to frustrations with substandard equipment and consequent inability to work efficiently and effectively</li> </ul>	Almost Certain	Moderate	High

Risk summary	
The overall risk rating for this option is:	High

#### 4.1.2 Option 1: Industry Standard refresh

Our experience in managing client devices, demonstrates proactive refreshes of our client devices mean fewer failures and performance issues than replacing when unusable (Option 0). It saves on support costs, gives greater protection against cybersecurity threats, and has less impact on our ability to maintain quality, reliability and security of electricity supply.

This option focuses on proactively managing our client devices by continuing to refresh the device fleet, the same approach used during the 2015–2020 RCP. Life cycles for this option are set to industry and vendor recommended options for useful life (where not already under our IT Asset Management Plan). This approach seeks to mitigate the risk of replacing devices when they become unusable and does not disrupt the business with changes to our device refresh strategy.

The option also includes:

- rationalising the device fleet to retire/repurpose devices with minimal evidence of recent use;
- providing ongoing support for our mobility growth through a rapid transition of workstations to laptops across the period (■% of workstations moved to laptops when workstations were due to refresh); and
- reducing the tablet fleet to ■% across the period, given increase in laptops to support mobility.

#### 4.1.2.1 Costs

This option requires the expenditure shown in Table 4. A total of **\$34.776 million** (Dec \$2017) of capex for the 2020-25 RCP.

**Table 4: Capital expenditure required for Option 1, \$million (Dec \$2017)**

Cost Type	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total 2020/21 - 2024/25
Capex	6.876	7.042	6.579	6.615	7.664	34.776
<b>TOTAL COST</b>	<b>6.876</b>	<b>7.042</b>	<b>6.579</b>	<b>6.615</b>	<b>7.664</b>	<b>34.776</b>

#### 4.1.2.2 Advantages

- Ability to deliver electricity services in an efficient and prudent manner
- Minimised financial, organisational, regulatory and reputational risks compared to replacing devices when they become unusable
- Increased mobility within the business enables a more responsive approach to customer needs and network management

#### 4.1.2.3 Disadvantages

- Doesn't seek to maximise client device life cycles
- Doesn't seek to explore further rationalisation of device fleet (and associated costs)
- Doesn't minimise the cost of refreshing our client devices

#### 4.1.2.4 Risks

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
1	Reliability	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to individuals within the business losing capability to manage the electricity network resulting in:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network faults</li> <li>• untimely updates to configuration management systems</li> <li>• increased frequency and duration of network outages for customers</li> </ul>	Rare	Minor	Negligible

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
2	Financial	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>• reductions in business productivity due to high reliance on devices by nearly all business functions, resulting in increased expenditure and/or reduction in service to customers</li> <li>• higher IT operational expenditure to resolve failures/ issues and manage more complex (older and more varied) device fleet</li> <li>• cybersecurity breaches (see Reputation below) resulting in significant litigation/punitive damages and legal costs</li> </ul> <p>NB: Consequence reduced on this option given support cost impacts being lower for a fleet kept as current as possible</p>	Unlikely	Minor	Low
3	Health and safety	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to:</p> <ul style="list-style-type: none"> <li>• Untimely detection and correction of network status that has the potential to cause a bushfire and/or injury or death to workers, contractors, public</li> <li>• field workers not having access to safety critical and/or configuration management information before they start work on a site (eg whether a section is energised or not, cable locations, site safety plans)</li> <li>• difficulty in tracking and contacting field workers cannot in remote locations</li> </ul>	Rare	Major	Low
4	Reputation/ Customer service	<p>Client devices that become insecure or unsupported by the vendor could become open to increased cybersecurity incidents resulting in:</p> <ul style="list-style-type: none"> <li>• our organisations', and customers', private data network security being compromised</li> <li>• significant litigation/punitive damages, legal costs and major loss of management time</li> </ul> <p>NB: Aged hardware inhibits our ability to maintain apply updates/security patches on devices</p>	Unlikely	Minor	Low

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
5	Regulatory	<p>Client devices that become insecure or unsupported by the vendor could:</p> <ul style="list-style-type: none"> <li>become non-compliant with regulatory requirements for supply availability and cost containment</li> <li>breach cybersecurity and privacy legislation</li> </ul> <p>NB: Aged hardware inhibits ability to maintain and apply updates/security patches on devices</p>	Rare	Moderate	Low
6	Organisational	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>more individuals unable to perform their role for a longer time until appropriate alternative devices are provided and/or their device issues resolved</li> <li>device failure can result in rework by users even after a device is fixed</li> <li>not using IT services due to loss of confidence in technology resulting in loss of benefits previously delivered</li> <li>higher staff turnover due to frustrations with the substandard equipment and consequent inability to work efficiently and effectively</li> </ul>	Rare	Moderate	Low

Risk summary	
The overall risk rating for this option is:	Low

#### 4.1.3 Option 2: Business as usual refresh

This option focuses on actively managing our client devices and continuing to refresh the device fleet using the current approaches. It includes:

- using device life cycles in line with our IT Asset Management Plan;
- rationalising the device fleet to not include devices that have minimal evidence of recent use; and
- small transition of workstations to laptops across the period (■% of workstations moved to laptops when workstations due to refresh) to continue our mobility shift.

##### 4.1.3.1 Costs

This option requires the expenditure shown in Table 5. A total of **\$27.465 million** (Dec \$2017) of capex for the 2020-25 RCP.

**Table 5: Capital expenditure required for Option 2, \$million (Dec \$2017)**

Cost Type	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total 2020/21 - 2024/25
Capex	5.843	6.156	5.624	4.723	5.119	27.465
<b>TOTAL COST</b>	<b>5.843</b>	<b>6.156</b>	<b>5.624</b>	<b>4.723</b>	<b>5.119</b>	<b>27.465</b>

**4.1.3.2 Advantages**

- Ability to deliver electricity services in an efficient and prudent manner
- Financial, organisational, regulatory and reputational risks maintained at current levels, a significant reduction compared to replacing when devices become unusable
- In-line with current device strategy, seeks to maximise client device life cycles

**4.1.3.3 Disadvantages**

- Doesn't explore further rationalisation of device fleet (and associated costs)
- Doesn't minimise the cost of refreshing our client devices

**4.1.3.4 Risks**

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
1	Reliability	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to individuals within the business losing capability to manage the electricity network resulting in:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network faults</li> <li>• untimely updates to configuration management systems</li> <li>• increased frequency and duration of network outages for customers</li> </ul>	Unlikely	Minor	Low
2	Financial	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>• reductions in business productivity due to high reliance on devices by nearly all business functions, resulting in increased expenditure and/or reduction in service to customers</li> <li>• higher IT operational expenditure to resolve failures/issues and manage more complex (older and more varied) device fleet</li> <li>• cybersecurity breaches (see Reputation below) resulting in significant litigation/punitive damages and legal costs</li> </ul>	Unlikely	Moderate	Low

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
3	Health and safety	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to:</p> <ul style="list-style-type: none"> <li>untimely detection and correction of network status that has the potential to cause a bushfire and/or injury or death to workers, contractors, public</li> <li>field workers not having access to safety critical and/or configuration management information before they start work on a site (eg whether a section is energised or not, cable locations, site safety plans)</li> <li>difficultly in tracking and contacting field workers in remote locations</li> </ul>	Rare	Major	Low
4	Reputation/ Customer service	<p>Client devices that become insecure or unsupported by the vendor could become open to increased cybersecurity incidents resulting in:</p> <ul style="list-style-type: none"> <li>our organisations', and customers', private data network security being compromised</li> <li>significant litigation/punitive damages, legal costs and major loss of management time</li> </ul> <p>NB: Aged hardware inhibits our ability to maintain apply updates/security patches on devices</p>	Unlikely	Minor	Low
5	Regulatory	<p>Client devices that become insecure or unsupported by the vendor could:</p> <ul style="list-style-type: none"> <li>become non-compliant with regulatory requirements for supply availability and cost containment</li> <li>breach cybersecurity and privacy legislation</li> </ul> <p>NB: Aged hardware inhibits ability to maintain and apply updates/security patches on devices</p>	Rare	Moderate	Low
6	Organisational	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>more individuals unable to perform their role for a longer time until appropriate alternative devices are provided and/or their device issues resolved</li> <li>device failure can result in rework by users even after a device is fixed</li> <li>not using IT services due to loss of confidence in technology resulting in loss of benefits previously delivered</li> <li>higher staff turnover due to frustrations with substandard equipment and consequent inability to work efficiently and effectively</li> </ul>	Unlikely	Moderate	Low

NB: This option mitigates the risk of the do-nothing approach and does not disrupt the business with significant changes to device management.

<b>Risk summary</b>	
The overall risk rating for this option is:	Low

**4.1.4 Option 3: Role Based Refresh**

This option retains a proactive approach to refreshing client devices, but focuses on actively managing them to maximise the asset end of life and minimise costs by:

- where appropriate, extending warranties to stretch the useful life to an acceptable level of risk based on our experience in managing our device fleet; and
- rationalising the fleet in-line with supporting our operating model; and by defining device requirements based on user roles and our device role matrix (see Section 5.5 - Device role matrix).

We will actively manage assets, and for some device types the useful life will be sweated further than those defined in our IT Asset Management Plan. Where the risk is acceptable, some devices will only be refreshed on break-fix. Specifically, display devices, monitors and televisions, will only be replaced on break-fix under this option. Our IT Asset Management Plan will be updated based on any successful outcomes of taking this approach.

To continue our mobility focus we have applied our device role matrix to shift █ % of ‘desk workers’ to be more mobile as defined by our ‘roaming worker’ profile.

**4.1.4.1 Costs**

This option requires the expenditure shown in Table 6. A total of **\$23.245 million** (Dec \$2017) of capex for the 2020-25 RCP.

**Table 6: Capital expenditure required for Option 3, \$million (Dec \$2017)**

Cost Type	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total 2020/21 - 2024/25
Capex	4.424	5.512	5.109	4.103	4.098	23.245
<b>TOTAL COST</b>	<b>4.424</b>	<b>5.512</b>	<b>5.109</b>	<b>4.103</b>	<b>4.098</b>	<b>23.245</b>

**4.1.4.2 Advantages**

- Able to deliver electricity services in an efficient and prudent manner
- Financial, organisational, regulatory and reputational risks within acceptable levels
- Maximises the useful life of client devices
- Minimises the cost of our device fleet

**4.1.4.3 Disadvantages**

- Doesn’t maximise risk mitigation on likelihoods of devices underperforming or failing
- Carries a higher level of residual risk than our business as usual approach

#### 4.1.4.4 Risks

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
1	Reliability	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to individuals within the business losing capability to manage the electricity network resulting in:</p> <ul style="list-style-type: none"> <li>• untimely detection and correction of network faults</li> <li>• untimely updates to configuration management systems</li> <li>• increased frequency and duration of network outages for customers</li> </ul>	Unlikely	Minor	Low
2	Financial	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>• reductions in business productivity due to high reliance on devices by nearly all business functions, resulting in increased expenditure and/or reduction in service to customers</li> <li>• higher IT operational expenditure to resolve failures/issues and manage more complex (older and more varied) device fleet</li> <li>• cybersecurity breaches (see Reputation below) resulting in significant litigation/punitive damages and legal costs</li> </ul> <p>NB: In reducing available devices and extending some asset useful lives further, this option has a higher Likelihood than our business as usual approach</p>	Possible	Moderate	Medium
3	Health and safety	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, may lead to:</p> <ul style="list-style-type: none"> <li>• Untimely detection and correction of network status that has the potential to cause a bushfire and/or injury or death to workers, contractors, public</li> <li>• field workers not having access to safety critical and/or configuration management information before they start work on a site (eg whether a section is energised or not, cable locations, site safety plans)</li> <li>• difficulty in tracking and contacting field workers cannot in remote locations</li> </ul>	Rare	Major	Low

Risk ID	Risk domain	Consequence description	Likelihood	Consequences	Risk rating
4	Reputation/ Customer service	<p>Client devices that become insecure or unsupported by the vendor could become open to increased cybersecurity incidents resulting in:</p> <ul style="list-style-type: none"> <li>our organisations', and customers', private data network security being compromised</li> <li>significant litigation/punitive damages, legal costs and major loss of management time</li> </ul> <p>NB: Aged hardware inhibits our ability to maintain apply updates/security patches on devices</p>	Unlikely	Minor	Low
5	Regulatory	<p>Client devices that become insecure or unsupported by the vendor could:</p> <ul style="list-style-type: none"> <li>become non-compliant with regulatory requirements for supply availability and cost containment</li> <li>breach cybersecurity and privacy legislation</li> </ul> <p>NB: Aged hardware inhibits ability to maintain apply updates/security patches on devices</p>	Rare	Moderate	Low
6	Organisational	<p>Failure and/or poor performance of client devices, due to assets past their useful life and/or not kept current and supported within the environment, will lead to:</p> <ul style="list-style-type: none"> <li>more individuals unable to perform their role for a longer time until appropriate alternative devices are provided and/or their device issues resolved</li> <li>device failure can result in rework by users even after a device is fixed</li> <li>not using IT services due to loss of confidence in technology resulting in loss of benefits previously delivered</li> <li>higher staff turnover due to frustrations with the substandard equipment and consequent inability to work efficiently and effectively</li> </ul> <p>NB: This option has a higher likelihood of impact, compared to our business as usual approach, due to less flexibility with a reduced device fleet size</p>	Possible	Moderate	Medium

Risk summary	
The overall risk rating for this option is:	Medium

## 4.2 Cost, benefit and risk assessment

The costs and benefits associated with all four options are summarised in Table 7 and the risks for all four options are summarised in Table 8.

Table 9 provides a more detailed cost, benefit and risk assessment. Detailed cost models are attached in Appendix A – Cost Models

**Table 7: Costs associated with options considered, \$000's (Dec \$2017)**

Option	Total capex <sup>9</sup> (10 year)	NPV <sup>10</sup> (10 year)	2020-25 RCP cost <sup>11</sup>	Overall risk rating	Ranking
Option 0: Replace unusable	52,264	(46,070)	(27,114)	High	4
Option 1: Industry standard refresh	70,869	(62,282)	(34,776)	Low	3
Option 2: Business as usual	56,002	(49,376)	(27,465)	Low	2
Option 3: Role based refresh	46,326	(40,802)	(23,245)	Medium	1

We note that:

- all option costs were supported by detailed cost models and key assumptions, based on industry-standard estimation methods;
- cost estimates were based on both current analysis and historical costs of similar projects;
- external estimates were sought for all vendor-related costs; and
- the costs have been validated with the internal device subject matter experts for reasonableness and completeness.

**Table 8: Risk domain summary**

Risk domain	Option 0 Replace unusable	Option 1 Industry standard refresh	Option 2 Business as usual	Option 3 Role Based Refresh (Selected)
Reliability	Medium	Negligible	Low	Low
Financial	High	Low	Low	Medium
Health and safety	High	Low	Low	Low
Reputation/Customer service	High	Low	Low	Low
Regulatory	High	Low	Low	Low
Organisational	High	Low	Low	Medium
<b>SUMMARY</b>	High	Low	Low	Medium

The overall cost, benefit and risk assessment for each option summarised in Table 9 was conducted in accordance with the SA Power Networks Risk Management Framework (Appendix B).

<sup>9</sup> Represents the total capital expenditure required, over the 10-year cash flow period from 1 January 2020 to 31 December 2029.

<sup>10</sup> Net present value (NPV) of the proposal over the period from 1 January 2020 to 31 December 2029, based on discount rate of 2.89%.

<sup>11</sup> Represents the total capital expenditure in the 2020-25 RCP.

**Table 9: Overall cost, benefits and risk assessment for the options considered (Dec \$2017)**

Option	Benefits	Costs/risks	Overall risk rating
Option 0: Replace when unusable	Defers expenditure until devices are unusable	<p>\$27.114 million capex</p> <p>Due to the high dependency on IT services delivered via client devices, this option's high likelihoods of device failure/ decreased performance leading to high levels of risk across health and safety, financial, reputation, regulatory and organisational domains</p> <p>An average of 10 minutes of lost productivity a day for all staff, due to device issues, can add up to over \$7 million in lost productivity<sup>8</sup> a year across organisation.</p> <p>Does not minimise device replacement costs (primarily due to increased labour costs associated with reactive replacement).</p>	High
Option 1: Industry Standard refresh	<p>Able to deliver electricity services in an efficient and prudent manner</p> <p>Best mitigation of risks associated with 'Replace when unusable'</p> <p>Supports increased mobility</p>	<p>\$34.776 million capex</p> <p>Lowest risk of device failure and impact</p> <p>Doesn't maximise useful life nor minimise refresh costs</p>	Low
Option 2: Business as usual	<p>SA Power Networks able to deliver electricity services in an efficient and prudent manner</p> <p>Seeks to maximise useful life</p> <p>Maintains current level or risks associated with client devices</p>	<p>\$27.465 million capex</p> <p>Devices may still fail, but the likelihoods and consequence are sufficiently reduced to present at worst a Low level of risk</p> <p>Doesn't minimise refresh costs</p>	Low
Option 3: Role based refresh	<p>SA Power Networks able to deliver electricity services in an efficient and prudent manner</p> <p>Maximises device useful life and minimises refresh costs by adopting a targeted approach to reducing size of device fleet in-line with user role requirements</p>	<p>\$23.245 million capex</p> <p>Overall medium risk is higher than current levels of risk mostly due to organisational impact to adjust to a reduced fleet size</p>	Medium

### 4.3 Option selected

**Option 3: Role based refresh** has been selected because it:

- enables the efficient delivery of electricity services by ensuring our workers have current and appropriate client devices;
- maximises the useful life of client devices;
- minimises the cost of device refreshes as shown by this option having the lowest total expenditure for 2020-25 RCP and lowest NPV over the 10-year period, 2020 to 2029 (inclusive);
- prudently allows SA Power Networks to maintain an acceptable risk profile rather than see it increase by relying on devices that are not supported and past the end of their useful life; and
- helps to achieve the expenditure objectives (eg managing the demand for network services, complying with applicable regulatory obligations and requirements and maintaining the reliability and safety of the distribution system).

## 5 Supporting evidence

This section outlines the supporting evidence for this business case.

### 5.1 Device refresh previously approved recurrent expenditure

Given its fundamental nature for the operation of the business and provision of electricity services to our customers, recurrent expenditure on refreshing client devices has been accepted in the past by the Australian Energy Regulator.

**\$20.12** million (Dec \$2017) was accepted in our regulatory submission for the 2015-20 RCP. Our projected spend for the 2015-20 RCP (actuals plus forecast) is **\$26.438 million**. This 31% increase in expenditure from the original estimates has been primarily due to the uptake in mobility solutions as outlined in Section 2.3 - Issues and risks associated with not proceeding.

Our selected option is a balance between a necessary uplift on previously accepted expenditure to ensure we can maintain levels of service and a reduction from actual costs to be as efficient as possible in doing so.

Our selected option represents a:

- 12% reduction from the current RCP actuals/forecast
- 16% increase from previously accepted expenditure in the last regulatory submission

### 5.2 Device mobility improvements

In the 2015-20 RCP we are delivering mobility through dedicated devices, eg the use of tablet devices while retaining desktops for users. With improved technology, new universal converged devices balance performance and mobility. This allows us to plan for supplying more fit-for-purpose devices while reducing the overall number of devices in our fleet.

### 5.3 Risks avoided/Near misses

Our proactive approach has typically minimised the impacts of device issues on the organisation, but reactive replacement is still necessary at times.

For example, during the current RCP (2015–2020) many workers had morning log-in issues that meant a more than 15 minute wait before being able to start work. The issues were identified as common to an older model of desktop computer that was at the end of its useful life. The devices were all replaced as soon as possible.

To provide an order of magnitude demonstration of the value of replacing older devices on a performance basis alone, we conducted performance tests comparing an older, still functional device, with a model it was replaced with. Refer to Appendix C - Performance Test Analysis for details. In summary, the costs of replacing older models of devices with newer models appears justified based on the offset of potential productivity impacts alone.

An industry paper puts annual failure rates for notebooks at around 20%<sup>12</sup>. The risks of failure are mitigated each time a device is refreshed. As part of our IT Asset Management Plan we will begin measuring such failures to make more informed decisions on useful life management.

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<sup>12</sup> [www.statista.com/statistics/272397/annual-failure-rates-of-notebooks-in-the-us/](http://www.statista.com/statistics/272397/annual-failure-rates-of-notebooks-in-the-us/)  
<https://www.statista.com/statistics/272397/annual-failure-rates-of-notebooks-in-the-us/>

## 5.4 End user computing asset life cycles

The life cycles for client device assets used to forecast costs in this business case are based upon our IT Asset Management Plan document. These life cycles are typically based upon vendor and industry recommendations, with our own experience informing risk in our environment to sweat assets where possible past the ‘standard’ definition of their useful life to ensure efficiency and prudence (Table 10).

**Table 10: Device life cycles applied to each option (years)**

Useful life	Option 1 Industry standard refresh	Option 2 Business as usual	Option 3 Role Based Refresh	ATO useful life <sup>13</sup>	Gartner recommendations <sup>14</sup>		
					Aggressive	Mainstream	Cost constrained
Standard laptop	█	█	█	2	2	3	4
Standard desktop	█	█	█	4	4	4.5	5
CAD desktop	█	█	█	4	2	3	3
CAD laptop	█	█	█	2	2	3	3
Monitor	█	█	█	4	Not covered		
Tough device	█	█	█	missing	Not covered		
Mobile phone	█	█	█	3	2	2.5	3
Tablets	█	█	█	2	2	3	3
Meter reading	█	█	█	2	Not covered		
Plotter	█	█	█	4	Not covered		
Television	█	█	█	5–10	Not covered		
Projector	█	█	█	5	Not covered		
Video conferencing unit	█	█	█	5	Not covered		
Tele conferencing unit	█	█	█	5	Not covered		

## 5.5 Device role matrix

To ensure a standard and fit-for-purpose device is provided to all users, while controlling growth in our device fleet in a prudent manner, we have introduced a ‘device role matrix’. This matrix is a key component of the IT Asset Management Plan and outlines the device requirements for various user roles in the organisation. The matrix has been developed from our own experience in using devices in our environment combined with industry input from suppliers and Gartner. Based on this analysis we have adopted a variety of devices and associated useful life policies that reflect the spectrum of work styles, as reflected by the defined user roles, and suitability to the user role’s work tasks (Table 11). Within some roles there is a choice of devices depending on specific sub roles, eg CAD users may be using a desktop or laptop depending on their specific tasks.

In addition, some devices are shared and not individually assigned. This allows more continuous and efficient use of the devices. The majority of field crews share some devices. Meeting rooms include shared workstations and conferencing units as required.

<sup>13</sup> From [Taxation Ruling TR 2018/4](#). Income tax: effective life of depreciating assets (applicable from 1 July 2018)

<sup>14</sup> [www.gartner.com/doc/3871479/use-recommended-life-spans-guide](http://www.gartner.com/doc/3871479/use-recommended-life-spans-guide) <https://www.gartner.com/doc/3871479/use-recommended-life-spans-guide>

<sup>15</sup> Cheaper model not yet identified is kept at 5-year cycle as assuming can’t stretch these as far.

**Table 11: Device role matrix**

Role type	Tough device	Mobile phone	Desk phone	Laptop		Tool of trade	Tablet	Desktop	
				CAD Laptop	Standard laptop			CAD Desktop	Standard desktop
Desk worker			✓						✓
Managers, team leaders, supervisors		✓			✓		✓		
General mobile worker (asset inspectors, engineers, project workers, support personnel)		✓			✓				
CAD worker			✓	✓				✓	
Field worker - General	✓	✓				✓			✓
Field worker - Apprentice		✓							
Field worker - Trade skilled worker	✓	✓							
Field worker - Customer connect officer		✓			✓				
Field worker - Works coordinator		✓			✓				
Warehouse Worker	✓	✓							✓

## 5.6 Device fleet explanation

The cost models for each option of this business case have been based on projecting an expected device fleet size for the start of the 2020-25 RCP.

For options 0, 1 and 2, we have based our device fleet numbers on the same standards we use for reporting device numbers in Regulatory Information Notices (**RIN**) and rationalised the number of devices down to exclude devices that our monitoring software indicates have not been in active use during 2018.

For Option 3, our selected option, we have used our device role matrix to project a required number of devices based on its application to our workforce. We supplemented this analysis with a review of our location and vehicle needs and made some small allowances for hot desking and spares. The summary details provided below are for Option 3 unless otherwise specified.

### 5.6.1 Number of users by role

Table 12 summarises the number of active users by role for 2017-18. This was determined to be a reasonable representation of the number of users in the 2020-25 RCP. These numbers have been developed through detailed analysis of our HR records, both internal headcount and use of external service providers, and user login records for 2017–2018.

SA Power Networks makes extensive use of external service providers. These external service providers typically require a device provided by us to enable them to undertake work on our behalf using our systems, data and processes. At any given time, the number of external service providers ranges up to 1000

people across the organisation supporting regulated business functions. These numbers are included in the total active user numbers.

**Table 12: No. of users by role (2017-2018)**

User roles	Number of active users
Desk worker	██████████
Managers, team leaders, supervisors	██████████
General mobile worker (asset inspectors, engineers, project workers, support personnel)	██████████
CAD worker	██████████
Field worker (general)	██████████
Field worker – Apprentice	██████████
Field worker – Trade skill worker	██████████
Field worker – Customer connect officer	██████████
Field worker – Works coordinator	██████████
Warehouse worker	██████████
<b>Total Active Users</b>	██████████

**5.6.2 No. of client devices**

The result of the analysis of the role matrix and the number of active users for computing and communication client devices is summarised in Table 13. Overall, we expect to replace ██████ client devices over the 2020-2025 period. About ███% of the device fleet is shared to maximise usage efficiency. On average, most workers have access to two devices – generally a phone and another device.

Three categories of client device are of note.

**Share Devices: Hot desks and meeting rooms (█████ devices)**

- Hot desks: Approximately █████ desktops (██% of the fleet) are used for shared use hot desking in multiple sites across the organisation. These also support business continuity in the event of a disaster.
- Meeting rooms: Approximately █████ computing devices are used to enable 102 meeting rooms across the state plus a number of large training rooms and general administrative functions, eg shared display screens at depots for customer job management. The use of digital technology in meeting rooms facilitates reduction in travel for our field workers, especially in regional depots, to attend necessary meetings. This increases their time in field supporting electricity services locally for our customers.

**Table 13: Numbers of client devices by category**

General Device Category	Primary Devices		Tough devices	Smart Devices		Total devices	% of devices
	Desktops	Laptops		Tablets	Mobile phones		
Individually Assigned	■	■	■	■	■	■	■
Shared: Field Crew & Warehouse Devices			■			■	■
Shared: Hot Desks & Meeting Rooms	■					■	■
Specialist Technical Purpose		■				■	■
Spares	■	■	■	■	■	■	■
<b>Total</b>	■	■	■	■	■	■	

**Specialist Technical Purpose Devices**

- Operational technology devices:** To reduce the chances of cybersecurity incursions on critical infrastructure, we have two separate networks and sets of devices for the control and operation of the distribution network and the ‘normal’ corporate IT network. This ‘control and operation’ network is commonly referred to as the operational technology (OT) environment, which is distinct from the IT environment where corporate systems such as SAP or Office 365 are accessed. SA Power Networks operates a strict security policy that limits devices to only be able to connect to either IT or OT networks (it is not possible to connect one device to both networks). This complies with security best practice and ensures the OT distribution network remains secure from cybersecurity threats. Accordingly, a fleet of devices used by our Network Operations Centre and all related network operations staff cannot access corporate IT business applications. Most of them are covered by primary devices or supported by an allowance for spares and hot desks.
- ‘Tool of trade’ devices’:** Additionally, we have 'tool of trade' devices. These specialised laptops are used for a very specific purpose such as testing or commissioning electrical network devices and ‘operational control’ equipment. Most if not all workers with a PC or laptop used in the operational technology environment also have a PC or laptop for accessing corporate business applications in the IT environment. This is standard practice across all electricity utilities to minimise the possibility of cybersecurity attacks.

There are approximately ■ devices within this category of the device fleet.

**Spares**

Devices do fail and can to do under stressful outage conditions when they are most needed. Hence a small set of devices is retained as spares locally. The number of spares represents ■% of the client device fleet and is based on past experience of the failure rates of the devices in our environment.

### 5.6.3 Other devices and peripherals

The client device refresh expenditure also encompasses a number of general devices and peripherals that enable particular organisational functions or support the business as a whole (Table 14). Peripherals represent a large number of devices but these have small unit costs, are of a consumable nature and replaced on a break-fix basis, eg standard monitors. The funding is treated as a ‘pool of funds’ rather than related to a specific item.

**Table 14: No. of other devices and peripherals by type**

Device Type	No. of devices
Meter Reading Devices	█
Plotters	█
TVs, Large Monitors & Displays	█
Projectors	█
Conferencing Units	█
Peripherals (normal monitors, keyboards, mice etc.)	█
<b>Total Other Devices &amp; Peripherals</b>	█

### 5.6.4 Summary costs by device type

**Table 15: Summary costs (Dec \$2017) by device type for the 2020-25 RCP**

Device Category	Type	No. of devices	2020-2025 RCP Cost
<b>Client Devices</b>	Primary Devices (Desktops, laptops)	█	█
	Tough Devices	█	█
	Smart Devices (Mobile phones, tablets)	█	█
<b>Other Devices</b>	Meter Reading Devices	█	█
	Plotters	█	█
	Large Displays & Conferencing (TVs, Large Monitors & Displays, Projectors, Conferencing equipment)	█	█
<b>Peripherals</b>	Minor IT Pool of Funds	█	█
	<b>Total</b>	█	█

Overall, we expect to replace around █ devices over the RCP. We are sharing assets where possible and efficiently sweating the assets where we can, and it is safe to do so.

Appendix D summarises the device numbers underlying the costed options in this business case.

## 5.7 Operating system as a service

Microsoft will release updates that at some point in the next RCP<sup>16</sup> that will no longer be capable of running on part of the device fleet. This would expose the organisation to an unacceptable level of cybersecurity risk. A regular refresh cycle reduces the risk that SA Power Networks would need to replace entire fleets of client devices as at least a significant proportion of the fleet would be capable to running the latest version.

## 5.8 Lease options

SA Power Networks currently buys, maintains and refreshes devices for our workforce without using leasing arrangements, and thus requires the expenditure outlined in this business case. Our IT Asset Management function has explored leasing options in the past and found cost efficiencies for some asset types (eg high specification CAD devices). However, we continue to manage the device service ourselves because:

- it allows more flexibility in sweating assets and managing funding year to year as opposed to long term lease commitments;
- leasing does not present a significantly compelling business case; and
- leasing brings difficulties in tracking and managing devices across the business to minimise risks of overcharging.

We will continue to consider leasing options into the future if their cost benefit makes it a more compelling option.

## 5.9 Consistency with National Electricity Rules expenditure requirements

SA Power Networks considers that the capital and operating expenditure to implement the End User Computing Device Refresh is needed to meet the expenditure objectives listed in clauses 6.5.6(a) and 6.5.7(a) of the National Electricity Rules (NER). In particular, the expenditure is required to:

- ***meet and manage the demand for network services:***
  - the effective delivery of key IT services, enabled through users having access to client devices, is necessary for the effective operation of the electricity network, delivery of energy services and management of network outages, and for meeting our regulatory obligations;
- ***maintain the reliability, security and safety of the distribution system:***
  - through business activities enabled by IT services delivered by client devices; and
- ***comply with applicable regulatory obligations and requirements:***
  - with devices sufficiently current to support application of security updates and patches.

Consistent with the requirements of clauses 6.5.6(c) and 6.5.7(c) of the NER, SA Power Networks considers that the forecast operating and capital expenditures requirement to implement the End User Computing Device Refresh is:

- ***efficient:***
  - supports the efficiency and effectiveness of the operation and management of the network and the delivery of network services to customers
  - pro-actively targets a reduction in the device fleet size
  - helps to minimise operational costs

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<sup>16</sup> <https://www.pcauthority.com.au/news/windows-10-to-be-bundled-into-microsofts-new-monthly-management-plan-499414>

- ***prudent:***
  - adopts processes which are prudent and consistent with good electricity industry practice
  - considers appropriate sweating of assets, including break–fix on longer life assets, where risk is manageable
  
- ***realistic expectation of the demand forecast and cost inputs:***
  - uses historic costs as the basis for labour estimates
  - uses vendor prices for devices and deployment services
  - informed by thorough analysis of device fleet usage and workforce/operational strategy.

## Glossary

Abbreviation	Definition
ACCC	Australian Competition and Consumer Commission
CAD	computer aided design
IT	information technology
IT Asset Management Plan	Supporting Document 5.34 - IT Asset Management Plan
NER	National Electricity Rules
NPV	Net Present Value
OT	operational technology
RCP	Regulatory Control Period
RIN	Regulatory Information Notice

## A. Appendix A - Cost models

The cost models are contained within the following documents which are available on request.

1. Client Devices – Option 1 – Industry Standard refresh
2. Client Devices – Option 2 – Business as Usual
3. Client Device – Option 3 – Role Based Refresh

## B. Appendix B - SA Power Networks Risk Management Framework

The SA Power Networks' risk management framework defines the following quantitative measures of likelihood and consequence that are in turn used to determine the risk rating. The detailed risk assessment instructions are available on the SA Power Networks Intranet site.

### Risk likelihood rating

Rating	Descriptor	Description	Probability	Indicative Frequency
5	Almost Certain	Is expected to occur	96–100%	At least one event per year
4	Likely	It will probably occur	81–95 %	One event per year on average
3	Possible	May occur	21–80%	One event per 2–10 years
2	Unlikely	Not likely to occur	6–20%	One event per 11–50 years
1	Rare	Most unlikely to occur	0–5%	One event per 51–100 years

### Risk consequence rating

Rating	1 Minimal	2 Minor	3 Moderate	4 Major	5 Catastrophic
<b>Financial</b>	Less than \$100,000	\$100,000 or more, but less than \$1m	\$1m or more, but less than \$10m	\$10m or more, but less than \$100m	\$100m or more
<b>OH&amp;S</b>	Incident but no injury	Medical treatment only	Lost time injury	Death or permanent disability	Multiple fatalities
<b>Environment</b>	Brief spill incident No environmental damage	Minor spill Pollutant on site No environmental damage	Escape of pollutant causing environmental damage	Significant pollution on and off site < \$0.5m	Long term environmental damage
<b>Reputation/ Customer service</b>	Localised customer complaints	Widespread customer complaints or complaints to Ombudsman or Regulator	Intervention by the Ombudsman or Regulator	Repeated intervention by the Ombudsman or Regulator	Loss of Distribution Licence
	Adverse regional media coverage	Adverse state media coverage	Adverse media campaigns by customers, media, industry groups	Severe negative impact on both regulated and un-regulated businesses	Loss of Distribution Licence
<b>Legislative and regulatory</b>	Minor breaches by employees resulting in customer complaints or publicity	Act or Code infringements resulting in minor fines	Severe company or officer fines for Act or Code Breaches	Prison sentences for directors or officers	Loss of Distribution Licence
	ACCC require apology and / or corrective advertising	ACCC require special offer be made to all customers / suppliers	ACCC minimum level penalties	ACCC moderate level penalties	ACCC maximum level penalties
	Directors/officers given minimum fines	Directors/officers given moderate fines	Directors/officers given severe fines	Directors/officers given prison sentences	Loss of Distribution Licence
<b>Organisational</b>	Absorbed without additional management activity	Absorbed with minimal management activity	Significant event which requires specific management	Critical event which can be endured with targeted input	Disaster which can cause collapse of the business

Rating	1 Minimal	2 Minor	3 Moderate	4 Major	5 Catastrophic
<b>Reliability</b>	2000 customers without supply for a min. of 12 hours (ie a medium size urban feeder)	10,000 customers without supply for a min. of 24 hours (ie a major storm related outage or a major substation outage)	Up to 40,000 customers without supply for a min. of 48 hours (ie major multiple zone substation coincident outages)	Over 40,000 customers without supply for longer than 48 hours (ie major geographical areas off supply)	Adelaide CBD without supply for longer than 24 hours

**Risk classification rating**

Likelihood (Probability)	Threat consequences				
	Minimal (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (5)	Medium	High	High	Extreme	Extreme
Likely (4)	Low	Medium	High	High	Extreme
Possible (3)	Low	Low	Medium	High	High
Unlikely (2)	Negligible	Low	Low	Medium	High
Rare (1)	Negligible	Negligible	Low	Low	Medium

### C. Appendix C - Performance Test Analysis

To demonstrate the value of refreshing older devices with more current models we have conducted a simple set of performance tests on standard usage scenarios against an older device that was still functional and the model most of these older devices were replaced with. These tests were purely for demonstration purposes and conducted by our internal Client Device subject matter experts in a controlled environment.

The devices and outcomes of these tests extrapolated across a typical user day are show in **Table 16: Device Performance Tests** below.

**Table 16: Device Performance Tests**

	Older Device			Replacement Device		
Performance measure taken	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Time taken from power on to login screen (seconds)	■	■	■	■	■	■
Time taken from login screen to desktop (seconds)	■	■	■	■	■	■
Time taken to open an application (seconds)	■	■	■	■	■	■
Assumed total time to open 25 applications (seconds) (based on above)	■	■	■	■	■	■
Time taken to shutdown (seconds)	■	■	■	■	■	■
<b>Totals (seconds)</b>	■	■	■	■	■	■
<b>Avg (hours/day)</b>	■			■		
<b>Comment</b>	■			■		

The difference between the older device and replacement device could translate to ■ hours of lost productivity a day per user still relying upon the older devices.

If we assume:

- Average hourly cost for labour including all relevant overheads: ■ per hour

- Number of hours in an average work day: [redacted] hours
- Fleet of [redacted] devices replaced by [redacted] devices was [redacted]
- Average price of the replacements: [redacted]
- Labour/Deployment Service costs as per our cost models

Then we can extrapolate that:

- Lost Productivity across [redacted] in a year is approximately: [redacted] per year
- Costs to replace the [redacted] with [redacted] is approximately: \$ [redacted] million

With a greater than \$ [redacted] million difference in the assumed replacement costs compared to extrapolated annual productivity benefit, these tests and assumptions highlight the value in replacing older devices for performance reasons alone.

## D. Appendix D – Device Numbers for the Assessed Options

Table 17: Device fleet size

Device type	Option 0, Option 1 and Option 2 (Device Fleet projected at 2020 based on business as usual approach and removing inactive devices)	Option 3 (Device fleet from performing workforce and location analysis and applying device role matrix)
<b>Client Devices</b>		
Desktops	██████████	██████████
Laptops	██████████	██████████
Tough Devices	██████████	██████████
Tablets	██████████	██████████
Mobile Phones	██████████	██████████
<b>RIN Reporting Client Device Total</b>	██████████	██████████
<b>Other Devices &amp; Peripherals</b>		
Meter reading device	██████████	██████████
Plotter	██████████	██████████
Large Displays	██████████	██████████
Projector	██████████	██████████
Conferencing units	██████████	██████████
Peripherals	██████████	██████████
<b>Total Other Devices &amp; Peripherals</b>	██████████	██████████
<b>Total Devices</b>	██████████	██████████