Transgrid

People. Power. Possibilities.

Non-network ICT Overview Paper

2023-28 Revenue Proposal

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1. Purpose, structure and scope of this document

1.1. Purpose and scope of this document

This document explains and justifies at a high level our Non-Network Information and Communications Technology (ICT) capital expenditure (capex) for our prescribed transmission services. This document supports our Revenue Proposal and references other supporting documents for further detail.

All capex is presented in real 2022-23 dollars and is expressed in total costs (i.e. direct costs plus escalations and excluding overheads).

We explain and justify our:

- operating expenditure (opex) step change forecast in a separate opex step change overview document, and
- other categories of capex, including replacement capex (Repex), augmentation capex (Augex), and Non-network Other, in separate capex overview documents.

1.2. Structure of this document

This ICT Overview Paper is structured as follows:

- chapter 1 sets out the purpose of this document and hierarchy of documents that support our ICT capex forecast
- chapter 2 discusses the nature of our ICT expenditure, and the key drivers for our ICT forecast
- chapter 3 presents our previous and current period ICT capex with our forecast ICT capex, and the differences between our expected current period expenditure and the AER ICT allowance for the period
- chapter 4 discusses the key outcomes that we have delivered from our current period ICT capex
- chapter 5 presents our forecast ICT for the 2023-28 regulatory period, and discusses the key outcomes that we propose to deliver, and the drivers which underpin the projects that comprise our forecast
- chapter 6 explains our regulatory obligations and our investment governance framework
- chapter 7 explains our forecast method, inputs and assumptions used to develop our forecast ICT
- chapter 8 presents our forecast total ICT, including ICT by category, and
- attachment 1 lists the documentation, models and justifications that support this ICT Overview Paper and the ICT forecast.
- attachment 2 provides a summary table relating to our major proposed ICT packages for the 2023-28 regulatory period.
- attachment 3 shows our assessment of the interdependencies between the ICT packages
- attachment 4 describes how we have mapped our proposed ICT packages for 2023-228 to those used in our 2018-23 submission.

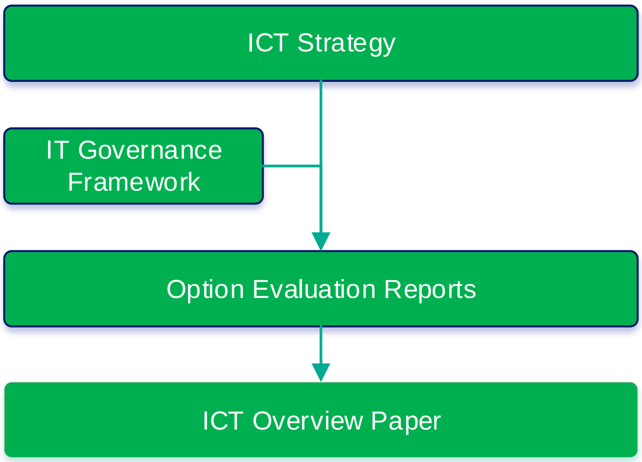
1.3. Supporting documents and models

A number of other documents and models support and form part of our 2023-28 Revenue Proposal. A summary of these documents and models relevant to ICT is listed in Attachment 1.

Figure 1-1 illustrates our hierarchy of documents and models that support our Non-Network ICT forecast, which we have submitted to the AER with our Revenue Proposal. This ICT Overview Paper is supported by our:

- **ICT Strategy** which details our overarching strategic approach to Information Technology management and investment, which supports the needs of the business in delivering network services, within a rapidly evolving energy and digital technology landscape.
- **IT Governance Framework** detailing our governance framework and our approach to portfolio optimisation.
- **Options Evaluation Reports** (OERs) – Non-Network ICT project and program economic evaluation business cases for each investment package, which apply cost-benefit analysis utilising cost-estimates and benefits, to economically assess each credible option against the status quo - to demonstrate prudency of the proposed investment.

Figure 1-1 Hierarchy of ICT documents and models



Our ICT expenditure considers ways to support the efficient, safe and secure management of our transmission network, through technology solutions including the assessment of capex to opex trade-offs. This approach ensures there is no double counting of expenditure, and maximises the benefits for our customers with a view to maintaining current performance and safety outcomes, and meeting regulatory obligations.

2. Nature and external drivers

This chapter explains the nature of our ICT capex, the key external drivers of our ICT forecast capex over the 2023-28 regulatory period, and the principles that underpin our ICT expenditure.

2.1. The nature of ICT

Our electricity transmission network forms the physical connection between regions in the National Electricity Market (NEM). It is essential for the connection of new low-cost renewable generation and stronger interconnection across the NEM to ensure the safety, security and reliability of supply and to enable customers to access affordable electricity.

ICT is key to ensuring that our staff can undertake their daily roles and supporting the safe, secure and reliable delivery of electricity. We require investment in our ICT so that we can:

- **provide our staff with the necessary ICT support to perform their roles** – this involves providing our staff with the necessary ICT services (e.g. access to the corporate network and applications) and equipment (e.g. laptops and iPads) to continue to work and collaborate with others. Our staff can only work effectively if we continue to provide these services in a reliable and suitable manner.
- **Meet our cyber security obligations**– changes in the cyber security landscape, including the Critical Infrastructure Bill 2021 and the draft Critical Infrastructure Protection Bill 2022[1] by the Federal government (collectively 'Critical Infrastructure Bills') and the NSW Government Energy Legislation Amendment Bill 2021, has led to the need for us to enhance our cyber security capabilities. As our applications reach end of life, we are required to update to continue to receive vendor support and security updates.
- **Enhance our digital capabilities in key priority areas** – we have identified ICT investments that will provide us with improved capabilities to effectively deliver our forward work program (including the major ISP projects), improve our engagement with stakeholders and enhance efficient decision-making going forward.

We expect our ICT investment will help us to be:

- **Connected** – ICT is helping to transform the business by connecting previously separate information and systems through digital technology to create the capability required for us to transition to the new energy market.
- **Secured** – ICT maintains appropriate security while increasing exposure to open networks and integrating more diverse and complex assets into the enterprise. As a Critical Infrastructure Provider of National Significance, we have regulated security obligations to protect energy provision to our customers from cyber-attack such as the Critical Infrastructure Act 2018 (CI Act), the Critical Infrastructure Bills, the NSW Government Energy Legislation Amendment Bill 2021 and AEMO's Australian Energy Sector Cyber Security Framework (AESCSF).
- **Value led** – We are modernising the ICT environment by creating agility in our ICT systems to solve a number of problems, rather than solve a particular business problem as in the past. We are focused on providing capability in ICT solutions rather than point to point solutions.

[1] The original Security Legislation Amendment (Critical Infrastructure) Bill 2020 has been split into two parts, Part 1 referred to as the 'Critical Infrastructure Bill 2021' which has passed parliament and a proposed Part 2 (the draft Critical Infrastructure Protection Bill 2022).

- **Insights-driven** – ICT integrates data to provide decision-makers with timely, consumable and contextual insights to provide potential innovation and become a thought leader in policy and customer issues. ICT also removes human error currently experienced from necessary manual intervention in some processes.
- **Adaptable** – Agile ICT helps the business to adapt rapidly as we address the risks and uncertainties driven by industry and technology disruptions. ICT provides the network business with the capability to scale to support our transition to the new energy market.

2.2. Key external drivers of our ICT capex

The key drivers for our ICT investment are as follows:

- **Adapt to the rapid changes in the energy and digital landscapes** to ensure we continue to deliver safe, affordable and reliable energy and services to our customers and provide the systems and capabilities necessary to deliver the major ISP projects,
- **Further embrace the opportunities presented by new technology** through prudent, risk-aware replacement and investment decisions guided by internal business requirements and external trends in both the energy and technology industries. For example, there is a market trend towards migrating to cloud based solutions, which we intend to adopt where appropriate,
- **Refresh and maintain our existing ICT capabilities** to ensure that staff can continue to perform their daily roles. Many of our ICT assets and applications have an average life of between three to seven years. These assets and applications, such as laptops, become less reliable and suitable as they age over time and will eventually become obsolete,
- **Meet our legal obligations** under the Critical Infrastructure Bill 2021 and the draft Critical Infrastructure Protection Bill 2022 by the Federal government and the NSW Government Energy Legislation Amendment Bill 2021. The proposed bills sets out enhanced cyber security requirements for critical infrastructure providers. We will need to improve our cyber security capabilities to meet the requirements set out in the bills,
- **Improve the mobility of the workforce** to allow our workers to work remotely. We have seen a tremendous shift in the nature of work due to restrictions arising from the COVID-19 pandemic. We need to ensure that our staff can continue to work and collaborate effectively while working remotely, and
- **Improve our engagement with customers** to deliver our forward work program, we will need to interact and consult with multiple stakeholders and landowners during the next regulatory period. Improvements in our ability to keep stakeholders informed and record interactions with stakeholders will reduce the likelihood that there is a dispute, thereby improving our ability to deliver projects on time and on budget.

2.3. Principles for our ICT expenditure

In a period of significant change, our non-network ICT investment approach of incremental transformation has allowed us to build our capability in a prudent and sustainable manner as the use of technology in our operations and across our supply and value chains continues to grow in intensity, diversity and criticality.

Our ICT expenditure is underpinned by four principles:

- **Protect information and systems** – we are an essential services provider with responsibility for sensitive data and take appropriate steps to protect the confidentiality, integrity, authenticity, availability and reliability of our information and systems.
- **Invest in deliverability and compliance** – we prioritise and justify every investment by deliverability and compliance. This ensures that we meet the expectations of our customers, community and security holders to allocate our resources efficiently and prudently.
- **Apply an enterprise mindset** – we prudently invest in our future performance so we can meet the needs of the energy market. Our prudent approach reduces the risk profile and provides the business with capability to adapt to the requirements of the energy market.
- **Innovate to evolve** – we prudently invest in recognising, developing and optimising technology solutions that advance our organisation and the services it provides.

2.4. Benefits of expenditure

We provide benefits to the business by improving the capability of existing applications through upgrades or replacements which deliver benefits to our customers. Benefits inform investment decisions and therefore need to be identified and carefully tracked. Investment in ICT follows a process of identifying, planning and managing an intended benefit throughout an ICT project. The Benefit Owner is responsible for ensuring a benefit is realised and improves the service to customers.

The benefits expected for our business are categorised according to our Benefit Management Framework which is the following:

- **Cashable benefits** are those benefits which directly impact on our opex or revenue which can be passed onto customers by providing better services, and
- **Non-cashable benefits** are non-financial benefits, such as lowering the operational risk profile which can result in a better service for our customers, or improve safety.

The benefits delivered to our network business enables us to deliver a safe, reliable and affordable service to customers. It also enables us to grow and scale to meet the needs of the energy market.

3. ICT profile

This chapter focuses on the capex spend and ICT trends over the past, current and next regulatory periods. In the 2014-18 regulatory period we refreshed legacy applications where appropriate. We are modernising our applications to cloud-based services in the 2018-23 regulatory period, as reflected in our capex spend in 2021-22 and 2022-23 (where the excluded spend on SaaS products is expensed). In the 2023-28 regulatory period, we plan to finalise the feasible transition to cloud-based services.

This chapter overviews:

- changes to our expenditure profile resulting from SaaS accounting changes in 2021-22 and 2022-23 in the current regulatory period
- the profile of our ICT capex over 2014 to 2028
- our actual/estimated ICT capex over the 2014-18 and 2018-23 regulatory periods, and compares it to the AER's allowances, and
- how our ICT capex between 2014 and 2022 compares with our peers.

3.1. Accounting treatment changes for SaaS products

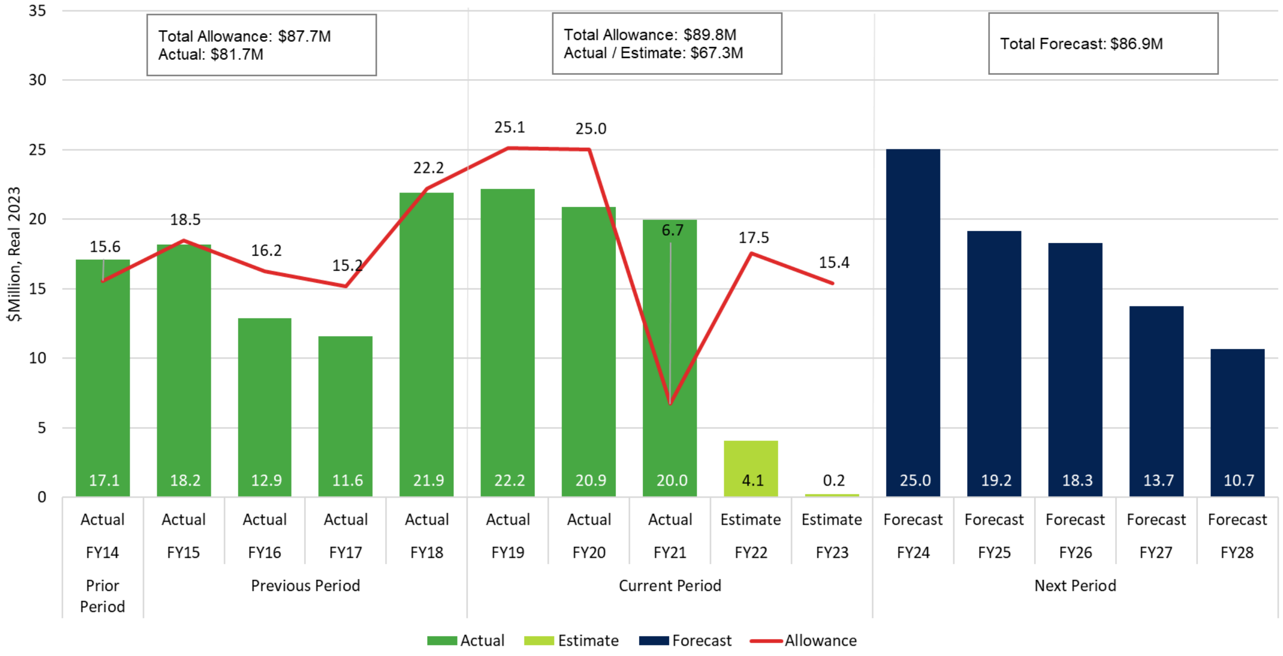
Our 2018-23 regulatory period AER allowance for ICT is $89.8 million. We estimate that we will spend $67.3 million of capex and an additional $25.0 million of SaaS opex to fulfil our ICT maintenance and modernisation commitments. Our total estimated ICT expenditure for the 2018-23 regulatory period (inclusive of capex and SaaS opex) is estimated to be $92.3 million, which is above our ICT capex allowance. In accordance with the IFRS accounting guidelines as they relate to the implementation of SaaS products, expenditure on SaaS from 2021-22 onwards has been removed from capex and attributed to opex. This IFRS accounting treatment change has significantly reduced the capex profile of ICT, however it has not reduced the total expenditure necessary on ICT services, where we have elected to spend more than the $89.8 million allowance when including the opex expensed implementation of SaaS products.

3.2. Previous, current and forthcoming periods

Figure 3-1 compares our actual and estimated ICT capex for the current and previous regulatory periods[2] compared to the AER's allowance, and presents our 2023-28 forecast ICT capex. This shows that our actual ICT was below the AER's allowance for the 2014-18 regulatory period. Our ICT capex is also below our allowance in the 2018-23 regulatory period due to a change in accounting standards, which is explained in Section 3.1.

[2] This information is presented in accordance with clause S6A.1.1(6) of the Rules

Figure 3-1: Actual and estimated ICT capex for the FY2014 to FY2028 period compared to the AER's allowance ($Million, Real 2022-23)



3.3. Variance in forecast and actual capex versus AER allowance

Table 3-1 shows our ICT capex for each regulatory period compared to the AER allowance and the variances.

Table 3-1: Historical and forecast ICT ($Million, Real 2022-23)

	2014-2018[3] Actual	2018-2023 Actual & Estimated	2023-2028 Forecast
AER allowance	87.7	89.8	
Actual ICT	81.7	67.3	86.9
Variance (Actual minus AER allowance) $ Million and %	(6.0) (6.8%)	(22.5) (25.1%)	

We make the following observations about our ICT capex profile:

- In the 2014-18 regulatory period we focussed on refreshing legacy applications that had reached their end of asset life with on-premise solutions.
- In the 2018-23 regulatory period we updated our end of life ICT assets, applications and systems and moved some of our core business applications to cloud based services, which will change our future capex profile. We have also focused on meeting our compliance obligations and legislative security requirements which were not reflected in our 2018-23 proposal.

[3] Five years presented for comparison purposes, 2013-14 to 2017-18.

- In April 2021, the International Financial Reporting Interpretations Committee (IFRIC) published guidance which clarifies that costs related to cloud computing arrangements, which are commonly referred to as Software as a Service (SaaS), should be expensed rather than capitalised. We have therefore revised our capitalisation policy for SaaS-related costs and expensed (rather than capitalised) these costs in 2021-22 and 2022-23. This has resulted in an underspend of the ICT allowance in the current 2018-23 regulatory period.
- Our forecast capex for the 2023-28 regulatory period is $5.2 million higher than the previous regulatory period and $19.6 million higher than the current regulatory period. Over the 2023-28 regulatory period, the drivers for the increase in capex is due to:
  - focus on legislative security requirements which continue to evolve, with more emphasis on risk and compliance requirements
  - advancement in technology and the need to continue to refresh legacy applications and systems over the years, and
  - modernising our ICT landscape, such as continuous improvement to new applications, upgrading infrastructure and user devices to align with technology trends, and mitigate outage risk due to aged systems.

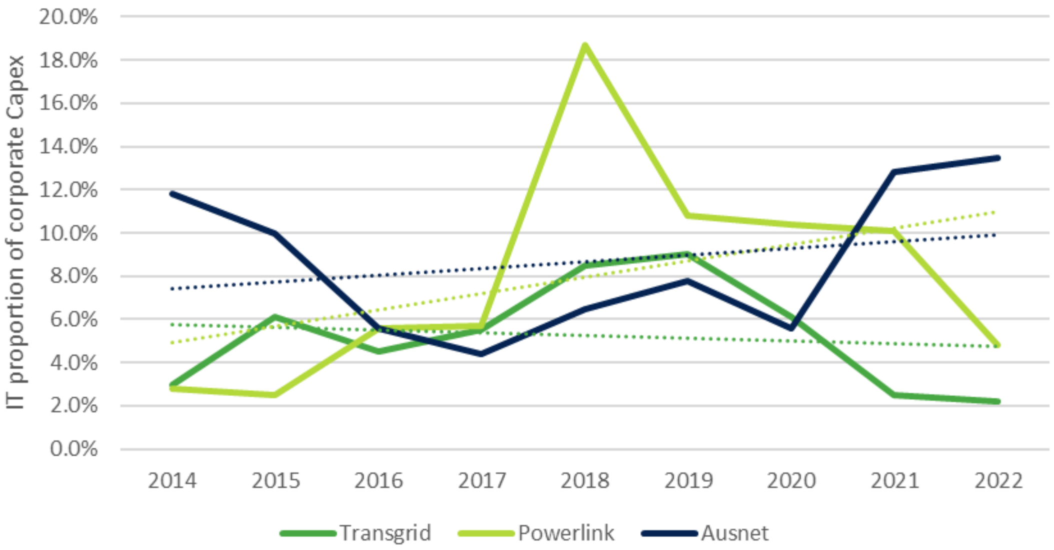
3.4. Benchmarking

Our annual ICT capex has remained consistent as a proportion of total corporate capex, showing a flat trend over the 2014-18 and 2018-23 periods compared with the trend of Powerlink and AusNet Transmission. In addition, over the 2018-23 regulatory period the trend of our ICT capex as a proportion of total corporate capex is below that of Powerlink and AusNet. This is forecasted to continue into the next regulatory period, showing a decrease in ICT spending relative to overall capex.

While not guaranteed, we are expecting that trend to continue into future periods due to our IT strategy of shifting to cloud based Software as a Service (SaaS) solutions and the changes in the financial treatment of this shift as an operational expenditure.

Figure 3-2 uses the latest actual data from the Annual Category RINs up to 2020, and the latest actuals and estimates for 2020-21, 2021-22 and 2022-23 for Transgrid.

Figure 3-2 ICT Capex share of Corporate Capex Compared to Peers

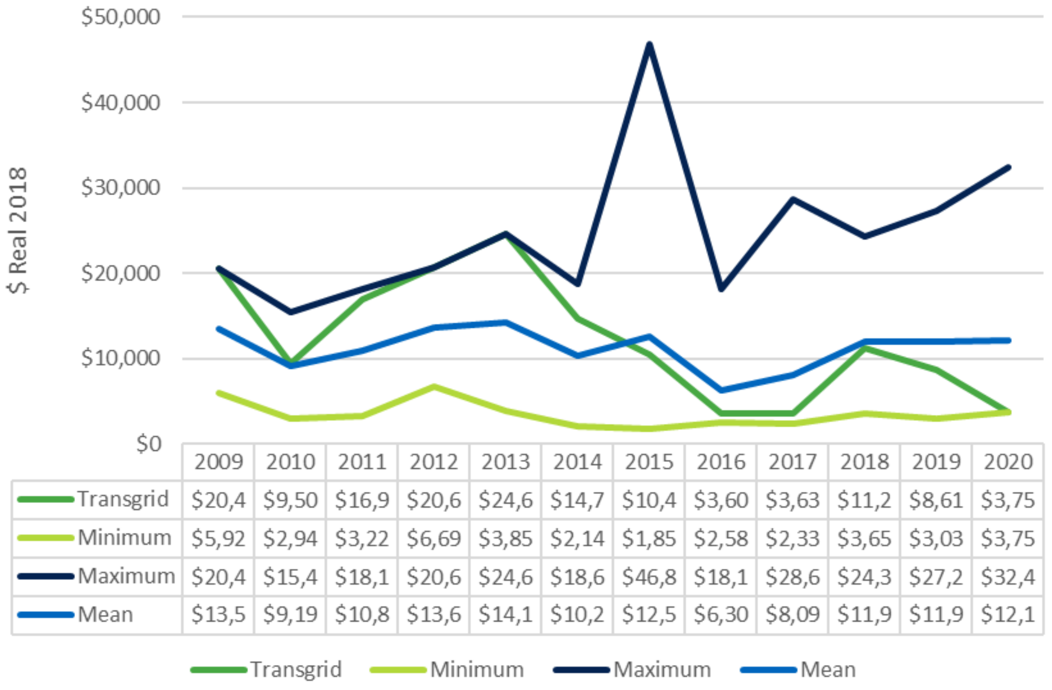


Our non-network IT recurrent capex spend covers the periodic replacement of IT assets due to age and product end of life and the continued provision of IT services to employees.

When looking at this expenditure in Figure 3-3 below, the data demonstrates that we have been prudent in our investments in our assets, regularly extending them over the recommended life cycle whilst managing risks to an acceptable level. The data below shows our spend profile has been less than the mean of our industry peers over this period and is decreasing. Coming into the next regulatory cycle, we will invest in refresh activities to maintain these applications, infrastructure and services to continue to receive vendor support and mitigate security risks and exposure of unsupported assets. The spend cycle for these assets are cyclical in nature and we do expect that as assets are refreshed, the solutions will be more flexible and scalable where possible and we will continue to use them beyond end of life where prudent to do so. Details relating to the various initiatives and scope are described in greater detail in the corresponding ICT OER documents.

Figure 3-3 Non-network ICT Capital expenditure (recurrent and client device) per employee

(Note: Metric is calculated by dividing the sum of non-network IT capital expenditure for client device and recurrent by number of employees)



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transgrid	$20,4	$9,50	$16,9	$20,6	$24,6	$14,7	$10,4	$3,60	$3,63	$11,2	$8,61	$3,75
Minimum	$5,92	$2,94	$3,22	$6,69	$3,85	$2,14	$1,85	$2,58	$2,33	$3,65	$3,03	$3,75
Maximum	$20,4	$15,4	$18,1	$20,6	$24,6	$18,6	$46,8	$18,1	$28,6	$24,3	$27,2	$32,4
Mean	$13,5	$9,19	$10,8	$13,6	$14,1	$10,2	$12,5	$6,30	$8,09	$11,9	$11,9	$12,1

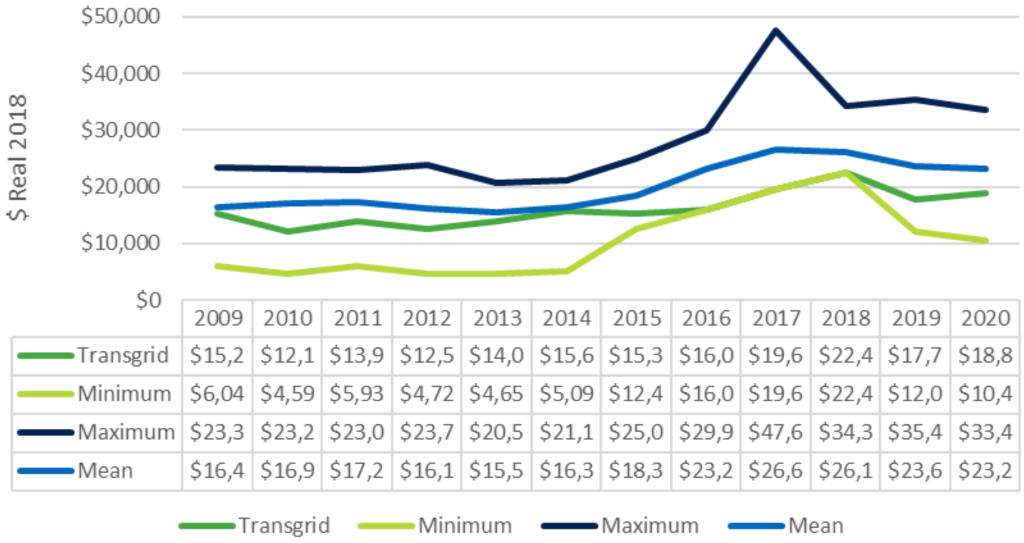
The industry non-network ICT operating expenditure per employee in Figure 3-4 below was flat to 2014, rose over the next three years and has remained at around the same level since 2017. This is indicative of a general drop in the number of employees in the industry whilst supporting a growing business.

We have been consistently below the industry mean in relation to our peers as we implement our strategy with a smaller workforce. In the next regulatory period, we will see further changes to our operating expenditure profile as we transition towards the future to allow us to meet the demands of the business and to best serve our customers. Our operating workforce will change, requiring greater flexibility and scalability as an organisation and individuals, as demonstrated by the impact of COVID-19, moving to remote work and being able to do business anytime and anywhere. Our tools used to provide services will need to continue to pivot to more modern platforms, as seen in our OERs, as our vendor product roadmaps are increasingly moving to cloud based solutions.

The change to the financial treatment of Software as a Service (SaaS) solutions as an operational expense will increase this pivot towards a reduction in capital expenditure for these tools should result in a decrease in the ongoing requirement to refresh applications.

Figure 3-4 Non-network ICT operating expenditure per employee

Metric calculated by dividing non-network IT operating expenditure by number of employees.



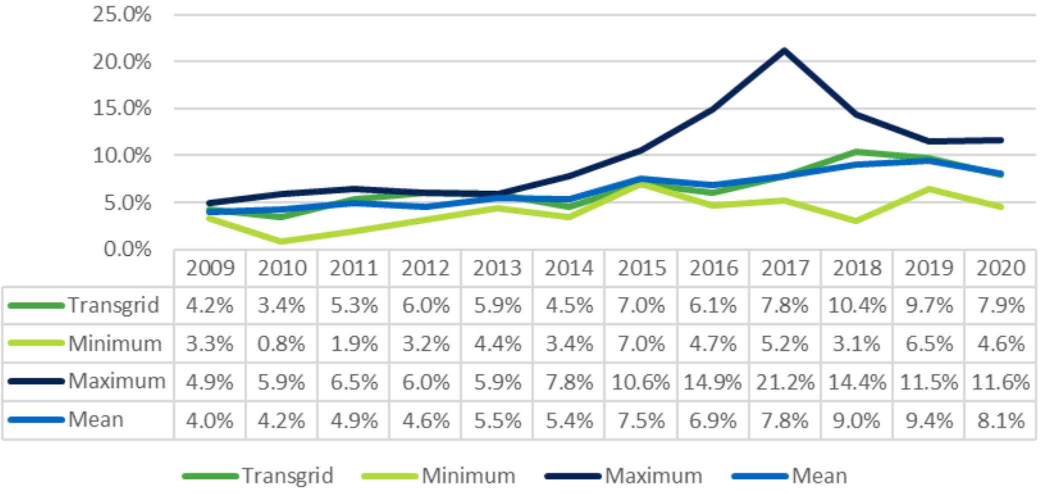
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transgrid	$15,2	$12,1	$13,9	$12,5	$14,0	$15,6	$15,3	$16,0	$19,6	$22,4	$17,7	$18,8
Minimum	$6,04	$4,59	$5,93	$4,72	$4,65	$5,09	$12,4	$16,0	$19,6	$22,4	$12,0	$10,4
Maximum	$23,3	$23,2	$23,0	$23,7	$20,5	$21,1	$25,0	$29,9	$47,6	$34,3	$35,4	$33,4
Mean	$16,4	$16,9	$17,2	$16,1	$15,5	$16,3	$18,3	$23,2	$26,6	$26,1	$23,6	$23,2

The non-recurrent IT total expenditure (capital + operating) as a % of total expenditure is an indication of the level of technology spend used by the transmission business in Figure 3-5 below. Over the previous regulatory periods, we have seen an increase in delivering network services through technology. This is likely to increase in future as the network will look to use technology to perform more with less employees, look to data to gain insights and efficiencies and support the transition of the energy market to renewable technology.

In the data below, our IT expenditure has tracked the industry mean with a slight fall over the last two years after a peak in 2018. Our organisation has announced major network programs leading into the next regulatory period and ICT will play an important role in supporting the network business achieve the benefits for consumers and industry. We expect that the overall IT spend will need to increase to support these initiatives but will decline as an overall percentage of total expenditure due to the size and volume of the planned network changes.

Figure 3-5 Non-network ICT expenditure as a % of total expenditure

Note: Metric calculated by dividing the sum of non-network IT expenditure and operating expenditure by the sum of transmission capital expenditure and operating expenditure.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transgrid	4.2%	3.4%	5.3%	6.0%	5.9%	4.5%	7.0%	6.1%	7.8%	10.4%	9.7%	7.9%
Minimum	3.3%	0.8%	1.9%	3.2%	4.4%	3.4%	7.0%	4.7%	5.2%	3.1%	6.5%	4.6%
Maximum	4.9%	5.9%	6.5%	6.0%	5.9%	7.8%	10.6%	14.9%	21.2%	14.4%	11.5%	11.6%
Mean	4.0%	4.2%	4.9%	4.6%	5.5%	5.4%	7.5%	6.9%	7.8%	9.0%	9.4%	8.1%

4. 2018-23 ICT capex and outcomes

This chapter sets out our actual and estimated capex over the 2018-23 regulatory period compared to the AER's allowances, and explains the variations.

For the 2018-23 regulatory period we expect that we will underspend the AER's allowance due to the accounting standard change described in Section 3.3.

Key messages:

Over the 2018-23 regulatory period:

- more than **61** per cent of ICT capex ($**40.8** million) is related to the application maintenance ICT package. This has or will allow us to:
  - replace our previous enterprise management system, Ellipse, [redacted]
  - introduce a new procurement solution, [redacted]
  - update and modernise a number of other systems related to Ellipse, and
  - move to cloud based solutions where appropriate.
- we are aiming to improve our cyber security capabilities and estimate that we will spend $**10.1** million (**15**% of total ICT capex) on the cyber security ICT package. Key activities include:
  - [redacted]
  - [redacted]
  - [redacted]
- we will replace two of our bespoke workforce management applications with [redacted]

4.1. Current period capex compared to the AER's allowance

Table 4-1 sets out our actual and estimated ICT capex over the 2018-23 regulatory period compared with the AER's allowance.

Table 4-1: Current period ICT ($Million, Real 2022-23)

	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Estimated	2022-23 Estimated	Total
Actual / estimated	22.2	20.9	20.0	4.1	0.2	**67.3**
AER allowance	25.1	25.0	6.7	17.5	15.4	**89.8**

4.2. ICT outcomes over 2018-23

Table 4-2 shows how we have spent or plan to spend ICT capex over the 2018-23 regulatory period by the eight ICT packages we have used to develop our forecast capex over the 2023-28 regulatory period. These packages are different to the packages we used in our 2018-23 regulatory submission. Attachment 4 describes the mapping we have done to align the different packages.

Table 4-2: Actual / estimated ICT capex over 2018-23 by new ICT category ($Million, Real 2022-23)

ICT Packages	2018-19	2019-20	2020-21	2021-22	2022-23	Average Annual	Total 2023-28
Application Maintenance	8.1	11.6	16.8	4.1	0.2	8.2	**40.8**
Bespoke Applications	0.0	0.4	-	-	-	0.1	**0.4**
Customer Safety and Support[4]	-	-	-	-	-	-	**-**
Data and Decisioning	0.1	0.6	0.6	-	-	0.2	**1.2**
Employee Enablement	1.1	0.8	(0.0)	-	-	0.4	**1.9**
Infrastructure and Network	9.2	3.0	0.5	-	-	2.5	**12.7**
Operational Evolution	-	0.2	0.1	-	-	0.1	**0.3**
Subtotal	**18.5**	**16.6**	**17.9**	**4.1**	**0.2**	**11.4**	**57.2**
Cyber Security	3.7	4.3	2.1	-	-	2.0	**10.1**
Total ICT	**22.2**	**20.9**	**20.0**	**4.1**	**0.2**	**13.5**	**67.3**

4.2.1. Application maintenance

More than 60 per cent of our estimated ICT capex over 2018-23 is related to the application maintenance package. This involves expenditure to refresh and modernise legacy systems such as Ellipse and other upgrades. In this regulatory period, we have or expect to deliver the following key items:

- [redacted] - an [redacted] Procurement solution, that provides both upstream (procure goods/services) and downstream (receipting goods/services and invoice matching) capabilities to deliver process automation. We expect [redacted] will minimise the disruption to our services by reducing the time for ordering and receiving a piece of network equipment.
- [redacted] HR solution supporting our human resource operation by refining our processes and optimising the capability for recruitment and learning management.
- [redacted] solution to replace the core EAM functionality of Ellipse to enable future business growth. The solution will provide a platform for further integration of other Asset Performance Management (APM) functionality which will drive future risk management.
- Finance Transformation – [redacted] solution will replace Ellipse's financial management capability. The new ERP will re-engineer finance business processes and enable Finance to better support the network and future business growth.
- Workforce Management – [redacted] solution which will replace Ellipse's core workforce management capability and a number of bespoke applications which are no longer fit

[4] The application is expected to be fully delivered in 2025-26.

for purpose. This solution will reform the end-to-end Work and Resource Planning processes, from long term planning and strategic decisions on sourcing for capital, maintenance and defect works, through to the capture of cost, and asset information at completion of work.

- Data Migration – to resolve our legacy data issues by implementing ongoing capability to maintain data quality.
- IT Pipeline Project – we will automate the corporate long range planning process by investing in [redacted] functionality to implement Corporate Valuation Modelling (CVM) capability. We will also be delivering a reporting and analytics capability which is an enabler to the Digital Enterprise solutions. The CVM and reporting and analytics solutions will provide more accurate data processing and reporting to business stakeholders.
- Worker Safety Authorisation and Training – [redacted] solution streamlined worker safety and training processes to ensure we comply with our obligation to provide workers with a safe workplace and that they are adequately authorised and trained when working at our sites.
- Enterprise Integration Platform – we implemented [redacted] Platform which is an integration technology that allows us to connect applications hosted on-premise and in the cloud. This integration platform will include the set up reusable 'micro-services' to provide an efficient service to the business.
- Integration Digital Core – we will develop several integrations to connect and support the Digital Enterprise and Field Force programs of work.

4.2.2. Cyber security

We estimate that we will spend $10.1 million of capex related to the cyber security ICT package. We have delivered or are expected to deliver the following key items between 2018-23:

- [redacted]
- [redacted]
- [redacted]

4.2.3. Bespoke applications

We estimate that we will spend $0.4 million of capex related to the bespoke ICT package.

4.2.4. Infrastructure and network

We estimate that we will spend $12.7 million of capex related to the Infrastructure and network package. We have delivered or are expected to deliver the following key items between 2018-23:

- Information Infrastructure [redacted] – we replaced our eight physical servers which host our virtual machines production environment that have been extended beyond their useful asset life and were unsupported by the vendor. We expanded our current [redacted] cluster to add compute and storage capacity which allows for prudent and efficient ongoing support costs and simplifies the deployment of infrastructure in the future.
- [redacted] – we refreshed two physical servers, [redacted]. This solution allows us to run large amounts of transaction processes in an efficient manner.
- Information Infrastructure 18-19 SQL 2008 and Windows 2008 – we refreshed the Windows servers and Structured Query Language (SQL) databases and instances which have reached the end of their serviceable life to ensure continued availability of applications, minimise business disruption and maintain ongoing support.
- Corporate Data Network Refresh 2018-19 – we replaced the Wide Area Network (WAN) routers which have reached their end of asset life and are unsupported by the vendor. This router replacement improved the performance and reliability of infrastructure ensuring continuous connectivity for our substations to communicate between each other and the entire data network.

4.2.5. Other ICT packages

We estimate that $3.4 million will be spent on the remaining four ICT packages. Most of this relates to the employment enablement package, which involves the replacement and maintenance of user devices. The other three packages (customer safety and support, data and decisioning, and operational evolution) represent new or improved capabilities, and have minimal capex in the current regulatory period.

5. 2023-28 ICT capex forecast and outcomes

Our 2023-28 ICT forecast of $86.9 million is $19.6 million, or 29 per cent, above our estimated 2018-23 capex of $67.3 million. Our ICT forecasts is required to continue modernising our ICT landscape for the first two financial years. A new ruling from the International Financial Reporting Standards (IFRS) Foundation means that for regulatory years 2021-22 onwards, we will expense costs for configuration or customisation in cloud computing arrangements, whereas these costs were treated as capex prior to 2021-22. In the absence of the new IFRS rule, our ICT expenditure would have increased by $23.7 million due to an additional:

- $0.6 million on our cyber security capability to comply with our operating license obligations and meet new cyber security legislation requirements
- $2.8 million on enhancing our customer relationships by providing real-time information about our planned work.
- $15.1 million on modernising our project management solution and expanding on our digital core capabilities to optimise inventory, asset and workforce management.
- $3.2 million on refreshing our work and collaboration applications to cloud solutions.
- $2.6 million on modernising our infrastructure and corporate data network assets so we can adopt technology which provides a flexible workplace.

This chapter sets out our forecast ICT capex for the 2023-28 regulatory period and the key outcomes we expect to deliver.

Key messages:

Over the 2023-28 regulatory period our proposed ICT capex will involve spending:

- $**65.7** million[5] (**76** per cent) to ensure that we continue to provide our staff with the necessary ICT support to perform their roles by:
  - providing them with the necessary devices, telephony services and access to the corporate data network
  - maintaining and refreshing the COTS and bespoke applications, and
  - improving their ability to work from home and collaborate effectively by moving towards Microsoft 365
- **$11.9** million (**14** per cent) on our cyber security package, which will allow us to meet new cyber security obligations under the Federal government's new Critical Infrastructure Bill 2021 and the draft Critical Infrastructure Protection Bill 2022, and the NSW Government's Energy Legislation Amendment Bill 2021
- $**6.3** million (**7** per cent) for data and decisioning package, which will refresh our legacy data platform, extending our access to business insights and ensuring compliance obligations are met
- $**1.9** million (**2** per cent) on our operational evolution package, which will provide us with a modern project management solution to deliver our forward work program and improve our ability manage our inventory, workforce and assets

[5] This comprises capex for application maintenance, bespoke applications, employee enablement, and infrastructure and network packages.

- $**1.0** million (**1** per cent) on our customer safety and support package, which would put in place an appropriate customer relationship management system and improve the functionality of our website to provide our stakeholders with real time, interactive information.

5.1. Forecast capex for the 2023-28 regulatory period

Table 5-1 presents our forecast ICT by category.

Our ICT forecasts for the 2023-28 regulatory period have been developed to continue modernising our ICT landscape for the first two financial years. We expect that our proposed ICT spend in the third and following years will reflect a normalised pattern of expenditure.

Table 5-1: ICT by category 2023-28 ($Million, Real 2022-23)

ICT Packages	2023-24	2024-25	2025-26	2026-27	2027-28	Average Annual	Total 2023-28
Application Maintenance	6.0	4.1	3.1	0.9	4.2	3.7	**18.3**
Infrastructure and Network	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**17.8**
Bespoke Applications	4.0	4.3	5.5	2.8	0.9	3.5	**17.5**
Employee Enablement	5.0	1.6	2.5	1.6	1.6	2.4	**12.2**
Data and Decisioning	2.8	2.4	1.2	-	-	1.3	**6.3**
Operational Evolution	0.8	0.3	0.2	0.6	-	0.4	**1.9**
Customer Safety and Support[6]	0.7	0.3	-	-	-	0.2	**1.0**
Subtotal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**75.0**
Cyber Security	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**11.9**
Total ICT	**25.0**	**19.2**	**18.3**	**13.7**	**10.7**	**17.4**	**86.9**

Our proposed capex over the 2023-28 regulatory period will deliver the eight packages of work, which we describe in further detail below.

5.1.1. Application Maintenance ($18.3M)

Efficiently maintaining and refreshing our applications is critical to avoid compliance and security vulnerabilities, business outages and unnecessary costs. This investment sub-category covers the maintenance and refresh of 93 Commercial off the Shelf (COTS) and Cloud applications that support our business, high voltage network and platform. It excludes bespoke applications and applications requiring enhanced capabilities, which are covered in other sub-categories.

[6] The application is expected to be fully delivered in 2025-26.

Our current approach to maintaining COTS applications is to refresh them when they reach their end of life (EOL). This is based on the recommendations of the ISO16350 framework, which suggests taking a risk-based approach for determining an application's life cycle. It is also consistent with industry standards and vendor recommendations. Our cloud based applications are maintained by the cloud provider as-a-service.

Given our existing approach to application maintenance is consistent with industry good practice, we have forecast expenditure based on continuing this approach into the next regulatory period.

5.1.2. Infrastructure and Network ($17.8M)

This sub-category covers expenditure to maintain our corporate data network (CDN), which includes routers, servers and data storage devices. Our CDN allows our staff across our offices, depots and other remote sites to access corporate information, our intranet and internet, and internal files, essential digital tools, such as Microsoft Office and Outlook, and communication and collaboration facilities, such as video conferencing.

The period 2018 to 2023 saw minimal investment in CDN assets and infrastructure as ICT expenditure was directed towards more critical areas. The resulting increased risk of business outages needs to be remediated in the next regulatory period. [redacted]. Maintaining this aging technology is expensive and runs the increasing risk of security threats, non-compliance and hardware failure.

We propose refreshing our CDN infrastructure and assets in the next regulatory period to mitigate this risk. We would also move certain infrastructure to the cloud, in line with our current transition to a hybrid (mix of on-premise and cloud) environment.

5.1.3. Bespoke Applications ($17.5M)

We currently have 17 legacy Bespoke applications that have been developed over the last 15 years. These bespoke applications provide capabilities not offered by Commercial off the Shelf (COTS) applications and enable key business activities, such as the planning and tracking of outages to High Voltage equipment, supporting our protection relays, maintaining metering equipment and customer billing, and identifying safety risks pertaining to work tasks.

However, these bespoke applications are becoming obsolete. [redacted]. Further, our current development platforms are inadequate and require modernisation.

The investment proposed under this sub-category involves refreshing our bespoke applications with a modern code base and implementing a secure development environment for all applications. Implementing a secure development environment will help us manage any cyber coding vulnerabilities and refreshing software with modern code will mean that our bespoke applications will no longer use an unsupported code that is becoming obsolete.

5.1.4. Employee Enablement ($12.2M)

Our proposed approach to providing “employee enablement” services involve giving our staff the necessary ICT devices (e.g. laptops and iPads), Microsoft Office software and telephony services to enable them to do their daily work and collaborate effectively.

During the current regulatory period, we have seen a tremendous shift in the nature of work due to restrictions arising from the COVID-19 pandemic requiring remote work. As a result, we have also seen the rise of new collaboration tools, such as Microsoft Teams and Zoom, which are now in mainstream use across the industry.

However, our current software restricts the digital tools available to our employees who, for example, are currently unable to attend Microsoft Teams or Zoom meetings using their Transgrid devices. At the same time, a number of core applications that support our enterprise are coming to end of life, when they will be out of vendor support, creating security vulnerabilities, and increasingly obsolete.

We propose adopting the Microsoft 365 subscription model and migrating to Microsoft Exchange Online and SharePoint Online. We will maintain our existing approach to procuring laptop and other devices, and replacing the soon to be decommissioned Integrated Services Digital Network (ISDN) telephony solution with a Session Internet Protocol (SIP) solution.

5.1.5. Data and Decisioning ($6.3M)

Due to a transitioning system landscape, we have gaps in our centralised availability of core data. The resulting inconsistent data flow affects our business operations and our visibility of compliance. Additionally revisions to our security posture resulting from the Critical Infrastructure Bills, requires us to invest in improved data classification and governance.

Over the 2023-28 regulatory period we will implement an enterprise data model and a data governance framework to lift data quality and integrity to a level that allows us to leverage sophisticated data solutions such as predictive maintenance and advanced data analytics to support prudent decision making. The increased data visibility provides a platform for additional insights and will refine and improve the way we operate. It will allow for more informed decision making and better outcomes for our customers. This work will provide automated and accurate information to simplify regulatory and financial reporting, unimpeded by disconnected systems and manual workarounds. It will also improve service to and communication with our customers.

In summary, the investment proposed under this sub-category involves implementing an enterprise data model and data governance framework, and replacing our data repository with a modern solution.

5.1.6. Operational Evolution ($1.9M)

Over the next five years, we will be involved in the delivery of several large complex projects and joint ventures with interstate partners. This represents a substantial shift in our business-as-usual work program, which has historically comprised of smaller scale projects.

Our current project management system, Microsoft Project and Portfolio Management (PPM), has significant limitations in managing both major and minor projects. It is a legacy system that will not be supported by our current vendor after September 2021 and is already experiencing slow performance and stability issues. It also does not provide many of the functionalities now standard for modern project management systems. For example, the PPM cannot:

- Provide budget and cash flow reports and forecasts
- Control costs in major projects by releasing funds progressively over project life
- Undertake detailed analysis of projects, including trend analysis, and
- Record more than 10,000 tasks for a project, which is essential for major projects.

- We propose replacing our existing PPM with an integrated hybrid cloud solution that incorporates the industry standards system [redacted]. We also intend to expand our digital core capabilities to allow us to better optimise inventory, asset and workforce management.

5.1.7. Customer Safety & Support ($1.0M)

Our current customer relationship management system (CRM), Consultation Manager, is used by our Community Engagement team to engage with the thousands of community members, including landowners and other stakeholders, affected by our expanding pipeline of major projects (including major ISP projects) and the extensive and ongoing work required to maintain 13,000km of transmission lines. Much of the information gathered by our CRM, including access permissions and conditions, is required by our field staff to ensure work is conducted safely and legally.

However, field staff do not currently use Consultation Manager due to limitations in its functionality and instead rely on information from the spatial system (TSS) instead. TSS is not integrated with Consultation Manager. This means that our field staff, who interact daily with landowners and customers, may start jobs or make decisions based on partial or incorrect information. This can create safety risks and precipitate time consuming access disputes. Furthermore, our current website does not provide customers with visibility to all our planned and current work. It also does not have modern functionalities, such as chat-bots or interactive maps.

To address these issued, we intend to upgrade our current CRM system to an already available CRM [redacted]. We will also extend the functionalities of our current website to support multi-channel engagement that will allow stakeholders self-service access to real time, tailored information.

5.1.8. Cyber Security ($11.9M)

The Federal Government has proposed legislation creating an enhanced regulatory framework, via the Critical Infrastructure Bill 2021 and the proposed part 2 of the Bill (the draft Critical Infrastructure Protection Bill 2022), that increases the security and resilience requirements of Australia's critical infrastructure. This builds on work completed by AEMO to develop the Australian Energy Sector Cyber Security Framework (AESCSF). There are two measures for cyber security capability and maturity in the AESCSF, with different timing expectations of when each level is compiled with:

- Maturity Indicator Level (MIL) – there are four MILs, MIL-0 through MIL-3;
- Security Profile (SP) – there are 3 alternate groupings of SP-1 to SP-3.

[redacted] the proposed Critical Infrastructure Bills will require us to achieve an AESCSF SP rating of 3 and a MIL rating of 3. [redacted]

On 13 October 2021 the NSW State Government introduced the Energy Legislation Amendment Bill 2021 (NSW Bill). This NSW Bill has been legislated and will bring forward the AESCSF compliance timeframe requirements of the Federal Critical Infrastructure Bills by 12 months.

Relevant compliance timings under the Bill are as follows:

- Within 12 months of rule commencement comply with requirements to meet SP-1 of the AESCSF Framework.

- Within 24 months of rule commencement comply with requirements to meet SP-2 of the AESCSF Framework (the earliest date for compliance is January 2024, or at the beginning of the 2023-28 regulatory period).
- Within 60 months of rule commencement comply with requirements to meet SP-3 of the AESCSF Framework.

Note that meeting the compliance requirements around data will also be covered under the Data and Decisioning package.

5.2. ICT Package interdependencies

As mentioned in section 2.1, we require ICT investment to:

- provide our staff with the necessary ICT support to perform their roles,
- enhance our cyber security capabilities, and
- enhance our digital capabilities in key priority areas.

Our ICT investments have been evaluated as a whole with consideration to what would be the most efficient way to deliver, adjusted for our ability to plan around resources and availability and timing of dependencies between different ICT packages. For example, our critical infrastructure replacement will be prioritised to occur first along with security and compliance obligations. Our applications are prioritised based on End of Life support impacts and risks. If we do not proceed with the proposed investments, then there may be adverse impacts on our abilities to meet our obligations in the most cost effective manner or to an acceptable risk level.

We discuss the interdependencies of the different ICT investment packages by theme in further detail below. We set out our assessment of the interdependencies between individual packages in Attachment 3.

5.2.1. Supporting our staff with their daily roles

Four of our proposed investment packages are related to providing our staff with the necessary ICT support to undertake their daily roles. These packages are as follows:

- the Bespoke applications and application maintenance packages are both related to the refresh and maintenance of the applications that our staff use to, among other things, manage our business and the High Voltage Network
- the infrastructure and network package involves the maintenance and refresh of our Corporate Data network, which our staff uses to access applications, corporate documents, applications, the intranet, Microsoft Office and Outlook etc. and
- the employee enablement package sets out our proposed approach to providing ICT devices (e.g. laptops and iPads), Microsoft office software, and telephony services to our staff.

These investments mainly cover the refresh of our current capabilities due to aging technology and End of Life support for our existing hardware and software solutions. The refresh of these initiatives will also help us meet our compliance to security and reliability requirements, as it will ensure that we continue to receive support from our vendors and mitigate risks associated with failure of equipment and unavailability of critical applications.

Our proposed ICT investments are designed to minimise rework and consolidate initiatives where possible to streamline the delivery of initiatives. For example, the proposed Employee Enablement package refreshes our communication and collaboration applications (Email, SharePoint, Microsoft Office) under a single initiative taking advantage of favourable licencing agreements. This in turn will lead to a reduced infrastructure footprint that will be required to be supported in our infrastructure and network package.

Another example is our proposed investment relating to the Application maintenance and Bespoke applications packages. We intend to migrate to the cloud where appropriate, which reduces the infrastructure footprint managed by the Infrastructure and Network package, and refresh applications to modern versions and solutions, which means we will no longer need to support hard to maintain, outdated technology.

The Infrastructure and Network package is the foundation on which all our capabilities reside. Though the other packages will impact the footprint of our infrastructure investment, the maintenance of our Core Data Network (CDN) is required for all of ICT systems to operate. The regular refresh of this network to maintain currency is required for entire Transgrid business to operate, irrespective of what applications reside on it.

Similarly, the employee enablement package is also foundational to the other packages, as without laptops or other devices, our staff cannot access any of our ICT services or capabilities.

5.2.2. Enhancing our cyber security capabilities

The Critical Infrastructure Bills detail a set of requirements that critical infrastructure providers will need to meet within various timeframes of its passing. Our cyber security package puts forward the initiatives that we need to be completed in order to comply with the current and proposed bills. It also lays the foundational framework for how we will secure our network, infrastructure and applications in the future.

Cyber security is not binary concept. As such, the proposed investments in many of other packages have also been designed to improve our cyber security capabilities. For example, our bespoke application involves implementing a secure development environment, which will allow us to move away from manual, ad-hoc testing of the cyber security of all our applications to an automated, systemic approach for testing.

Similarly, our proposed approach to refreshing and maintaining existing applications, Microsoft Office software, and network and infrastructure assets involve moving away from outdated, unsupported solutions to modern, supported solutions. This will help reduce the risk of a cyber-attack as supported solutions are updated and patched by the relevant service provider on an ongoing basis.

5.2.3. Enhancing our digital capabilities in key priority areas

We have identified the need to expand the digital capabilities we have in the next regulatory period. The relevant investments include:

- operational evolution package OER, which involves:
    - replacing our project management system with a modern solution – this will help us deliver the several large complex projects we have on our forward work program, and
    - expanding our capabilities to optimise our asset, workforce and inventory management.
- the customer and safety package, where we propose to:
    - upgrade our CRM to a modern solution to address limitations of the existing CRM, and
    - improve the functionality of our website to support real time, multi-channel engagement with stakeholders.
- the data and decisioning package, where we propose to:
    - replace our data repository with a modern solution – enabling the availability of data from our refreshed application and ERP landscape

- improve the enterprise level availability of data for improved timeliness and accuracy in decision making, and
- ensure improved data classification and governance for compliance with the Critical infrastructure Bills.

These proposed investments build upon the capabilities we currently have, and the guidelines and security frameworks set out in the cyber security package at an enterprise level. For example, our project management system will need to be integrated with our other applications, and so depends on other applications being maintained and refreshed. The proposed implementation of a secure development environment in the bespoke application package will also ensure that the three packages to enhance our capabilities are built on a secure foundation.

Similarly, the benefits we expected from our data and decisioning and customer and safety packages can only be realised if they are integrated with data from other applications.

6. Regulatory obligations and capital governance

We have robust capital governance arrangements in place to ensure that our ICT spend is efficient and prudent to meet our compliance obligations and to ensure that we support the delivery of our prescribed transmission services.

This chapter explains our regulatory obligations, the capital governance framework used to develop our ICT forecast, our investment governance process and portfolio optimisation process.

6.1. Regulatory obligations or requirements

Our key compliance obligations are derived from the National Electricity Rules (NER), our licence and new cyber-security obligations:

- **NER** – we are required to comply with all regulatory obligations under the NER, including provision of data to AEMO
- **Licence** – Licence Condition 7 (Data Security) of our Transmission Operator's Licence requires that personal, historical and current load data is held and accessible only in Australia, in accordance with the Privacy Act. We must therefore use an Australian-based provider for any cloud-based products and services, and
- **Cyber Security** – the CI Act and the Critical Infrastructure Bills, together with AEMO's AESCSF, the Energy Legislation Amendment Bill 2021 (NSW) and the Ransomware Payments Bill 2021 imposes security obligations on us and defines the cyber maturity level to be reached by Transgrid as a Critical Infrastructure Provider of National Significance.

We apply a consistent compliance-based process across each investment class to determine our current compliance obligations, identify material changes that require investment and evaluate least cost yet robust solutions.

6.2. Strategies and framework

The key inputs to our capital program include: board direction through the business' risk statement, oversight and guidance; business plans; and ongoing stakeholder views, which are tested and refined as we develop and manage our capital program.

Our proposal aligns with our corporate policies, frameworks and management systems. The following support our ICT forecast and methodology:

- ICT Strategy
- IT and Security Frameworks, and
- Options Evaluation Reports (OERs).

Key elements of these frameworks for our ICT capex are described below.

6.2.1. ICT Strategy

Our ICT Strategy document details our overarching strategic approach to ICT management and investment, describing how we support the business to deliver network services in a rapidly evolving energy and digital technology landscape. It discusses strategic drivers, sets out the demand and requirements from the business and articulates a roadmap and program of work.

6.2.2. IT and Security Frameworks

ICT and Security use the following frameworks:

- PRINCE2 - a structured project management methodology where projects are divided into manageable and controllable stages
- Information Technology Infrastructure Library (ITIL) - a set of best practices for transforming the business and alignment with the ICT Strategy
- Open Group Architecture Framework (TOGAF) version 9.2 - an enterprise architecture framework which provides an approach for designing, planning, implementing and governing an enterprise information technology architecture
- Agile methodology - an iterative approach to managing software development into several phases. It involves constant collaboration with stakeholders and continuous improvement at each stage
- Enterprise Risk Management (ERM) Framework - for identifying and managing risk
- AEMO's AESCSF - which assesses cyber security maturity and uplift to strengthen cyber security in the energy sector
- Information Security Management System (ISMS) ISO27001 - defines and manages controls a company needs to make information assets more secure, and
- Sherwood Applied Business Security Architecture (SABSA) - a framework for enterprise security architecture and service management.

6.2.3. Option Evaluation Reports

These documents identify the investment need and provide an economic evaluation to justify the investment and determine its optimum timing. We consider the costs and benefits of various options and sensitivities around key assumptions to test the robustness of the investment decision. The OERs will also identify options that were considered but not progressed further, usually due to legislative or security requirements. As such, there are some OERs where only one option has been put forward.

6.3. IT Governance Framework

Our IT Governance Framework sets out our process used to monitor and control key information technology capability decisions to ensure the delivery of value to key stakeholders in an organisation. It sets out the structure of who makes decisions, the process of how IT investment decisions are made, and how the results of these processes and decisions will be monitored, measured and communicated.

It requires investment decisions to pass through two internal decision gates to ensure delegated financial approval is applied and investment governance. Decision Gate 1 (DG1) is a requirement for project commencement approval, and Decision Gate 2 (DG2) is a requirement for project delivery approval.

For our ICT capex we use a tailored implementation of the PRINCE2 project method to ensure ICT projects are managed in accordance with Transgrid's policies and procedures and are efficiently delivered to the team responsible for supporting the ICT service.

We use a consistent, structured approach in the way that ICT projects are initiated, planned, implemented and finalised. This will improve our ability to adapt to changing circumstances in a timely manner, whilst ensuring the fiscal responsibility is maintained and quality outcomes are achieved.

All projects managed by ICT use the Project Management lifecycle described below:

- **Pre-project:** the pre-project stage focuses upon the identification and validation of the project need and approval of a project mandate
- **Start-Up Stage**: the objective of the start-up stage is to:
  - confirm there is business justification for initiating the project
  - define and confirm the scope of the project
  - analyse the ways a project can be delivered and select a project approach
  - that the key roles in the project have been allocated and agreed
  - plan the initiation stage
  - develop the DG1 (Project Brief) and seek approval according to Transgrid's financial delegations
- **Initiation Stage**: in this stage the following occurs:
  - the requirements are gathered, all stakeholders have with regard to the scope defined in the business case and defining the work that needs to be done to deliver the project before committing to significant spend
  - the functional and non-functional requirements from the business case are confirmed
  - a high design of the solution is prepared and any required procurement activities undertaken
  - the DG2 (Project Initiation Document) is developed and approval is sought according to our financial delegations
- **Management Stage(s)**: the section of a project(s) that the project manager is to manage on behalf of the Steering Committee at any one time, at the end of which the Steering Committee will review progress to date, the business case, risks and the next stage plan, in order to decide whether to continue with the project. A management stage consists of the following processes:
  - Controlling a Stage (CS)
  - Managing Product Delivery (MP), and
  - Managing Stage Boundaries (SB)
- **Close Project Stage**: confirm acceptance of the project products, that the objectives set out in the DG2 (or approved changes) or that the project has nothing more to contribute.

6.4. Portfolio optimisation process

We take a whole-of-portfolio view of the information technology risk, ranking the projects in our forecast ICT program to optimise the portfolio to:

- deliver technology solutions that support the optimisation of network investments
- ensure consistency with historical investments, and
- smooth the investment profile to consider deliverability and financial impacts.

We use the Transgrid's Risk Management Framework to mitigate risk and to ensure we remain aligned with corporate risk appetite and help us reconcile our bottom-up build of risks.

6.4.1. Delivering technology solutions that optimise the delivery of network investments

Changes in the energy market have seen a steady rise in the take up of renewable energy, requiring us to plan and manage our technologies as the situation demands. To ensure future network investments are optimal and underpinned by robust analysis, we use technology solutions that support Repex and Augex modelling.

We also work collaboratively to support the network needs of the business, facilitating, prioritising and delivering ICT solutions that maximise customer benefits from the investment. The collaborative process creates an Optimised Investment List. This list allows us to quickly demonstrate projects that would be left out under various capital constraints, helping stakeholders to understand the impact of different capex levels on services outcomes.

6.4.2. Ensuring Consistency with Historical Investments

As part of our investment review and governance process, we assess each proposed investment against the backdrop of historical investment levels for the investment class and the portfolio as a whole. This ensures we do not overstate future investment requirements by implicitly applying a more stringent risk criteria for forecast investment than what we have proven that we can manage in the past.

This process ensures future investment requirements are driven by new and emerging needs for investment, and not by a change in Transgrid’s risk appetite – unless these are clearly driven by changes in strategic objectives of the business as articulated in the Business Plan.

6.4.3. Investment profile smoothing

Analysis of internal and external resource capacity has informed the timing of projects to ensure that they fall within the expected resourcing constraints of the industry. In some cases, it may be possible to supplement the Australian workforce with qualified international resources to increase capacity to deliver the most critical projects. Otherwise, it may be necessary to defer some work and manage risks in the interim through opex based solutions and/or less efficient staging of capital work.

In preparing our 2023-28 forecast, we reviewed our resourcing approach against the internal and external market capacity to ensure that our proposed portfolio can be delivered efficiently. This includes consideration of products in the market and previous implementations of similar solutions to ensure delivery timeframes and enable the resource efficient delivery of the portfolio.

7. Forecasting method, inputs, models and assumptions

This chapter explains our forecasting methodology, the inputs to that methodology and the key assumptions that are reflected in our ICT forecasts for the 2023-28 regulatory period. We discuss the application of these forecasting methodologies for each expenditure category in this chapter.

7.1. Our ICT forecasting method

ICT is driven by protecting our information and systems, managing technology obsolescence, and supporting efficient network asset management and business support functions.

Our forecasting method is aligned with our investment process and follows PRINCE2 methodology and its principles. In demonstrating this alignment, we seek to ensure we are forecasting according to good ICT industry practice with a program of works that is based on prudent and efficient expenditure decisions, in a consistent manner that provides greater levels of transparency for stakeholders.

To forecast our ICT volumes for both unitised programs and the scope-of-work for non-united projects, we analyse our Fixed Asset Register to identify assets which have reached their end of asset life and need to be upgraded or replaced. For every investment class we analyse the performance of an application including meeting the business needs, application performance and support.

The ICT forecasting method includes the following steps:

- identifying applications that have reached their end of life according to the Information Technology Renewal and Maintenance Strategy. The end of useful asset life for software and hardware is based on the vendor's asset lifecycle or risk based assessment.
- performing an application assessment including performance, support costs, market trends and analysis, strategic alignment and business need, and
- developing a cost model to cost the package of work. The cost model is based on known software licenses and hardware costs, application support costs, project resources including internal labour, consultants and vendors, and previous costs to implement a similar solution. Costs are developed from a bottom up perspective.

The process is repeated for each ICT investment class[7] to form the program of works. We adjust scope or timing of the program to align with other capex projects / programs and constraints from business planning processes to ensure deliverability and optimised outcomes.

7.2. Risk types

Economic justification of ICT expenditure to address an identified need is supported by risk streams, to allow the costs of the project or program to be assessed against the value of the avoided risks and costs. The risk categories for ICT justifications include:

- Work, Health and Safety
- Reputation, community and media
- Compliance and Regulation

[7] Bespoke Applications, Application Maintenance, Customer Safety and Support, Data and Decisioning, Employee Enablement, Infrastructure and Network, Operational Evolution and Cyber Security.

- Customer/Reliability
- Financial
- People/Industrial Relations, and
- Environment.

7.3. Risk models

We commence our risk assessment by utilising the Transgrid Risk Management Framework. At a project level, our ICT teams follow our ICT Project Management Risk process, as outlined in 'AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines'.

In our risk modelling, we consider the elements below. This provides moderated, expected risks which are then used in economic evaluation assessments to justify our ICT forecast.

The process we use for risk involve the following elements:

- **Establishing the context**: identify the background, scope, underlying assumptions and objectives for conducting the Risk Assessment.
- **Identifying Risk**: identify the risk source which may prevent, delay or enhance the achievement of the project objectives.
- **Risk Workshops**: If required.
- **Analyse Risk**: to determine the risk rating. The assessment (qualitative and quantitative) is based on the Residual Risk as defined below:
  - Inherent Risk: where controls are excluded in the management of the risk, the risk rating to be applied is based on the worst case outcome should the risk arise, assuming controls have not been implemented or have failed.
  - Residual Risk: where controls are currently applied to manage the risk, the risk rating to be applied is based on the current controls and their level of effectiveness.
  - Planned Risk: where controls and treatment strategies are planned to be applied to manage the risk, the risk rating to be applied is based on the planned controls and their level of effectiveness.
  - Qualitative Assessment: Qualitative assessment involves the use of predefined scales to assess the probability and impact of a risk. These scales shall be used during risk identification workshops to assess the identified risks. All risks shall continue to be assessed using qualitative assessment throughout their life.
  - Qualitative Analysis: This will produce a qualitative rating for each risk based on the likelihood and impact values selected. When the two values are multiplied they are assigned a rating based on Transgrid's probability impact matrix.
  - Treat Risks: Develop and implement effective treatment strategies and action plans to mitigate the risk to a tolerable level.
  - Monitor and Review: This phase involves the ongoing monitoring of the process and must include the following steps:
    - adding additional risks as they are identified
    - tracking, updating and closing completed treatments

> reviewing, and if appropriate, amending the risk assessments

> closing risks that are not going to eventuate or, where risks have occurred, and

> identifying risks which need to be brought to senior management's attention.

- Communicate and Consult: should take place during all stages of the risk management process.

7.4. Key assumptions

Clause SA6.1.1 (4) of the Rules requires us to list the key assumptions that underpin our capex forecast, which are stated in Chapter 8 of our Revenue Proposal document.

7.5. Risk tools and templates

We utilise a number of different templates and plans that are available to Transgrid employees to evaluate, qualify and quantify, mitigate and track risks. These are available for use from the internal Transgrid intranet.

7.6. Unit costs

Our ICT forecast comprises:

- Unitised projects– these projects are forecast using standardised unit rates based on recent costs, and
- Non-unitised projects – these are individually costed projects, where the costs inputs are similar to those of recently implemented projects of similar scope.

All our capex for both unitised and non-unitised projects are estimated using a detailed cost model Excel spreadsheet and the outputs form the basis of our capex forecast for 2023-28.

7.6.1. Unitised projects

ICT forecast the costs of unitised programs by multiplying project activities by unit costs. For unitised projects, the unit rates are based on:

- our historical costs with movement in unit costs determined from most recent costs as recorded in Transgrid's Project and Portfolio Management System (PPM)
- labour rates, including burdening and on-costs for internal resources, as provided by Finance
- software license and maintenance costs, and
- contract unit rates from our service providers and consulting companies.

7.6.2. Non-unitised projects

Project costs are developed for work that has a higher level of complexity, which means that it cannot be costed upfront based purely on unitised rates. Our non-unitised projects require tailored cost estimates. For non-unitised scoped projects ICT develop costs based on a previous implementation with similar scope. The cost estimates include project activities which identifies internal and external labour costs.

7.7. Cost escalation

The costs we incur in delivering ICT services do not always increase in line with the basket of goods and services used by the Australian Bureau of Statistics (ABS) to calculate the consumer price index (CPI).

Therefore, in order to ensure that we are compensated for appropriate real cost increases that we will incur in acquiring the inputs necessary to provide services, we have engaged BIS Oxford Economics to forecast real increases in the cost of labour costs that we expect to incur during the 2023-2028 regulatory period.

Although we consider that real costs increases for materials are likely to grow faster than inflation over the 2023–28 period, we have not presently included any real materials cost escalation.

We have applied the labour cost escalators to our capex forecasts using appropriate weightings based on an estimated use of internal labour services to deliver work programs. While our ICT capex forecasts include the impact of cost escalation, our analysis in preparing the forecasts is conducted without the effect of cost escalation.

For example, the detailed analysis is conducted exclusive of cost escalators for the forthcoming regulatory period. To assist the AER, however, each of the capex overview papers includes a reconciliation table showing the escalated forecasts submitted in the Reset RIN template. The table below shows the aggregate impact of the cost escalators on our ICT Capex forecast for the forthcoming regulatory period.

Table 7-1: Impact of labour and materials escalation ($Million)

	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Total un-escalated ICT ($real 2023-23)	25.1	19.1	18.1	13.5	10.5	86.3
Escalation for material and labour	(0.0)	0.1	0.2	0.2	0.2	0.6
Total escalated ICT	**25.0**	**19.2**	**18.3**	**13.7**	**10.7**	**86.9**

Further details regarding our cost escalators are provided in the supporting document titled “BIS Oxford Economics - Labour Cost Escalation Forecast to 2027-28”.

7.8. Overheads

Overhead activities, such as corporate support, are needed to support ICT. The costs of those activities are capitalised in accordance with our Capitalisation Policy[8] and relevant accounting standards, including AASB 116.

Capitalised overheads are split between network and corporate overheads, consistent with the AER’s RIN definitions. We have forecast our overhead costs using the AER’s default approach based on:

- 75 per cent of capitalised overheads are fixed based on the most recent available year of actual capex (i.e. 2021-22), and
- 25 per cent of capitalised overheads vary with direct capex.[9]

The capitalised overhead forecast related to ICT is set out below. As shown in the table, changes to total escalated ICT from one year to the next affects the level of capitalised overheads allocated to ICT.

[8] Expenditure Capitalisation Procedure, Transgrid, 2018.

[9] This approach was adopted by the AER in its April 2021 decisions for the Victorian electricity distribution networks.

Table 7-2: Addition of capitalised overheads ($Million, Real 2022-23)

	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Total escalated ICT	25.0	19.2	18.3	13.7	10.7	86.9
Capitalised network overheads	-	-	-	-	-	-
Capitalised corporate overheads	0.5	0.3	0.3	0.3	0.2	1.6
Total escalated ICT with overheads	**25.5**	**19.5**	**18.6**	**14.0**	**10.9**	**88.5**

Capitalised overheads are forecast within our “2023-28 Capital Expenditure Model”.

7.9. Opex step change

Capex to opex step changes are assessed at the project and program justification level, not at the portfolio level. All opex requests are based on the total five year regulatory period and not annualised.

ICT require opex step changes for the following reasons:

1. Federal legislation has changed our security requirements. The impact of this legislation on ICT’s opex budget has been captured in the proposed $18.6 million opex step change[10].
2. The International Financial Reporting Standards Foundation (IFRS Foundation) has introduced a new ruling, which would change the accounting treatment of ICT expenditure. Under the new ruling, clouding computing costs will be expensed as opex rather than treated as capex, which would be depreciated over a number of years. We have proposed a $20.2 million opex base year adjustment to normalise the impact of this ruling, noting that it is cost neutral as there is a corresponding drop in capex.

7.10. Validation

7.10.1. Internal validation

We reconcile our bottom-up build of ICT forecasts with top-down reconciliation methods including:

- using market resource rates for Australian labour unit rates and technology service panel offshore rates based on competitive market tests undertaken in early 2020
- using Labour/Material/Expense based on actuals for similar projects in the current regulatory period, and
- broader business review of OERs by the ICT Portfolio Board.

7.10.2. External validation

We engage external independent consultants to verify and validate our processes and forecasts:

- recent competitive market pricing from tenders received in 2020 and 2021

[10] Cyber Security opex step change

- benchmarking market rates with 3rd party advisors
- 3rd party advice on market trends and risks, and
- Utilities Industry IT benchmarking against other utilities based on data obtained from the AERs Regulatory Information Notices.

7.11. Addressing uncertainty in investment requirements

Uncertainty is inherent in any forecast and our ICT forecasts are no different. To avoid adding additional risk-costs to our projected expenditure requirements, our forecasting approach addresses uncertainty through several mechanisms to ensure that we do not overestimate our expenditure requirements. These include:

- use of industry standard technology asset lifecycles for determining prudent timeframes for investment
- benchmarking market rates with 3rd party advisors
- 3rd party advice on market trends and risks
- clear visibility of forecasts containing higher degrees of uncertainty and risk mitigation plan that's been applied to minimise the uncertainty in forecast, and
- reuse of previous project actuals for comparison and estimates for cyclical initiatives.

8. Forecast expenditure by RIN category

This chapter provides a high-level explanation of the forecast capex for each ICT category specified in the RIN template.

8.1. RIN categories

Table 8-1 below lists each RIN category and the forecast capex over the 2023-28 regulatory period. Attachment 2 provides a high-level explanation of the forecast expenditure for each ICT category.

Table 8-1: Total escalated capex forecasts by RIN category

ICT category	Recurrent or non-recurrent	Expenditure forecast ($M, 2023-28)	Percentage of ICT
Application Maintenance	Recurrent	18.3	21.0%
Bespoke Applications	Recurrent and Non-recurrent	17.5	20.1%
Customer Safety and Support	Non-recurrent	1.0	1.1%
Data and Decisioning	Non-recurrent	6.3	7.3%
Employee Enablement	Recurrent and Non-recurrent	12.2	14.1%
Infrastructure and Network	Recurrent	17.8	20.4%
Operational Evolution	Recurrent and Non-recurrent	1.9	2.2%
Subtotal		**75.0**	**86.3%**
Cyber Security	Recurrent and Non-recurrent	11.9	13.7%
Total		**86.9**	**100.0%**

Attachment 1 – Supporting documentation

The following documents support our ICT submission for the 2023-28 regulatory period.

Policies and Governance

- IT Governance Framework

Strategies & Plans

- ICT Strategy

Business cases, scope of work and cost estimates (justifications supporting forecast ICT)

- OER-Data and Decisioning
- OER-Application Maintenance
- OER-Bespoke Applications
- OER-Operational Evolution
- OER-Infrastructure and Network
- OER-Employee Enablement
- OER-Customer Safety and Support
- OER-Cyber Security

Attachment 2 - High level explanation of ICT forecast capex projects

Figures presented in the table below exclude overheads and are in $2022-23.

Application Maintenance (recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 1 Application Maintenance summary

Application Maintenance	
Description	We rely heavily on commercial off the shelf (COTS) applications and cloud based applications for operational activities to deliver a safe and reliable electricity network. These applications deliver efficiency by lowering our operational cost and help us meet our regulatory requirements. These software applications are in conjunction with applications that allow Transgrid and its employees to operate day to day in providing services internally and to our customers.
Deliverables	Maintaining the security, interoperability and functionality of these applications requires on-going patching (from a functionality and security perspective), refreshing and upgrading of them to meet our obligations to remain as a prudent and efficient operator in the industry. These applications function to support and deliver our existing capability to our customers and provide a foundation to build on our capabilities.
Main drivers of expenditure	To keep our business functioning. This is the minimum amount of work required to keep the ICT applications functioning and allowing staff to perform their work.
Expenditure forecasting methodology	Based on historical work efforts for maintenance activities, patching and upgrades. Guidelines from vendors.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $40.8M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 $18.3M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	To maintain our existing ICT applications and allow it to continually function to support the company and its business.
Benefits	To maintain and provide capabilities in Transgrid's application suite. Maintenance of the core functionality of Transgrid's application suite to allow staff to continue to perform day to day activities and service customers.

Bespoke Applications (recurrent and non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 2 Bespoke Applications summary

Bespoke Applications	
Description	It is critical that our bespoke applications are developed, maintained and modernised to avoid inadvertently creating security vulnerabilities or performance issues due to lack of vendor support and/or skilled resources.
Deliverables	Maintaining the security, interoperability and functionality of these bespoke applications requires on-going patching (from a functionality and security perspective), refreshing and upgrading of them to meet our obligations to remain

Bespoke Applications	
	as a prudent and efficient operator in the industry. These bespoke applications function to support and deliver our existing capability to our customers and provide a foundation to build on our capabilities.
Main drivers of expenditure	To keep our business functioning. This is the minimum amount of work required to keep the ICT bespoke applications functioning and allowing staff to perform their work.
Expenditure forecasting methodology	Based on historical work efforts for maintenance activities, patching and upgrades. Guidelines from vendors.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $0.4M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 $17.5M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	To maintain our existing ICT bespoke applications and allow it to continually function to support the company and its business.
Benefits	To maintain and provide capabilities in Transgrid's bespoke application suite. Maintenance of the core functionality of Transgrid's application suite to allow staff to continue to perform day to day activities and service customers.

Customer Safety and Support (non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 3 Customer Safety and Support summary

Customer Safety and Support	
Description	Our current CRM system, Consultation Manager, is used by our Community Engagement team and contains information needed by our field staff, such as access permissions and conditions. However, our field staff do not use this CRM system due to limitations in its functionality. This results in inefficient practices in relation to making multiple visits to sites and in increased risk to the safety of our staff and community from a lack of accurate information on a site's situation. Further, we have identified the need to improve the functionality of our website.
Deliverables	We propose to enhance the customer experience through new digital services and enabling new customer and community communication pathways. This option proposes to implement the following capabilities: • Integrated Property and Consultation Management System*:* This solution would allow us to manage both information related to property and community in one system. It would leverage our existing property management/geo-spatial tool and implement additional module to provide functionality to manage and track customer engagements, communication and agreements. This will provide users with a holistic view of our interactions with stakeholders and land and property information in one centralised system. Our staff would have a greater view and access to information to assist with planning both operational and

Customer Safety and Support	
	maintenance work, property access plans, engaging with customers and ongoing relationship with landowners. • Property Information Aggregation System: Implement a tool that is able to aggregate information from source systems to provide access to all relevant information prior to seeking access to the property, such as geo-tech info, property agreements, heritage information, biosecurity measures, and native title. This solution would have an additional component, whereby it could replicate information captured internally, which could be made publicly available and displayed on our corporate website and other external facing digital channels, for use by customers.
Objectives	The objective of this initiative is to allow us enhance the customer experience through new digital services and enabling new customer and community communication pathways.
Main drivers of expenditure	To consolidate and make accessible accurate information between us and our customers, including land owners.
Historic and forecast expenditure	There is no historical and forecast expenditure for 2018 to 2023 because this OER is delivering new capability for our business. Forecast from 2023 to 2028 $1.0M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	See Description above.
Benefits	Improving Community and Landowner Management is critical to our ongoing success, business operations and for safely carrying out maintenance works.

Data and Decisioning (non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 4 Data and Decisioning summary

Data and Decisioning	
Description	There are increased compliance requirements stemming from the Critical Infrastructure Bills that require an improved data classification and governance.
Deliverables	Create an enterprise data model enabling an integrated view and understanding of how data is used across the business. Design and implement a holistic data governance framework across the business network to ensure consistency and integrity of the data into the future. It includes the connection of financial and asset information for regulatory reporting purposes, as well as ensuring availability of data to support field operations. It also includes the connection and utilisation of information from IoT to support Asset and Community Safety initiatives, leveraging a centralised reporting intelligence capability in a cloud-based reporting and analytics platform.
Objectives	Using data to enable us to provide timely, quality information to our staff and customers and leverage this to improve our decision making abilities across all areas and meet its obligations in relation to data integrity and security. These changes will enable us to meet our regulatory and compliance obligations under the new Critical Infrastructure Bills.

Data and Decisioning	
Main drivers of expenditure	Meet our regulatory and compliance obligations under the Critical Infrastructure Bills. Improve the data and reporting platform to provide more accurate reporting, better insights and decision making for the network business.
Expenditure forecasting methodology	Expenditure forecast methodology is based on bottom up costs using the previous data and reporting implementation costs as a reference.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $1.2M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 $6.3M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	Regulatory and Compliance Obligations under the Critical Infrastructure Bills by implementing a data framework to improve data classification, governance, compliance and management to both maintain and extent the flow of data between systems and inform business operations. Fix ongoing issues relating to the current state of data in our environment to increase accuracy, availability and efficiency. These benefits will flow onto the performance of our systems and information we provide to our customers and regulators and performance of our staff.
Benefits	See above.

Employee Enablement (recurrent and non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 5 Employee Enablement summary

Employee Enablement	
Description	Employee enablement OER involves providing our staff with the necessary ICT devices (e.g. laptops and iPads), Microsoft Office software and telephony services to enable them to do their work and collaborate effectively.
Deliverables	Procurement of ICT devices, migration to Microsoft Office 365, Exchange Online and SharePoint Online, and replace soon to be decommissioned telephony solution.
Main drivers of expenditure	Modernising the workplace to enable staff to work from anywhere at any time.
Expenditure forecasting methodology	Estimates based on workload reduction through automation. The implementation of industry standard tooling that is available through references and knowledge base. Device management will be a step change from capex to opex, calculated by user base population as a service.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $1.9M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 $12.2M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	Targeted investment in modern end user tools will enable more effective and efficient collaboration between our employees and our partners.

Employee Enablement	
	Moving to as a subscription model for Microsoft Office software, which allows us flexibility, scalability and better responsiveness for an on demand workforce.
Benefits	Modernising the workplace, see above.

Infrastructure and Network (recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 6 Infrastructure and Network summary

Infrastructure and Network	
Description	The recurrent infrastructure and network OER covers the work need to maintain and replace our core ICT infrastructure backbone. The Corporate Data Network (CDN) allows our staff to access internal documents, the corporate information, our intranet and internet, and essential tools, such as Microsoft Office and Exchange, and communication and collaboration facilities, such as video conferencing. The CDN comprises of Cisco Switches, Routers, Wireless Controllers, Proxy Servers, Firewalls/ Intrusion Prevention System (IPS), Umbrella DNS filtering appliances, and F5 load balancers. [redacted]
Objectives & Deliverables	There is a need to replace the CDN assets [redacted] that will reach their end of life during the 2023-28 regulatory period.
Main drivers of expenditure	We must maintain a continuous service to the network business so that the business can continually provide services to customers. As applications transition to a cloud service, we will leverage cloud-based platforms, where applicable.
Expenditure forecasting methodology	Based on historical work estimates. Capital costs for hardware and equipment available.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $12.7M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 $17.8M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	Ageing infrastructure [redacted]
Benefits	The CDN needs to be maintained to support our day to day services, its employees and customers. The platform needs to be maintained and updated to function. This includes allowing us to meet its security and regulatory requirements.

Operational Evolution (recurrent and non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 7 Operational Evolution summary

Operational Evolution	
Description	This OER involves replacing our current project management system, Microsoft Project and Portfolio Management (PPM) with a modern project management solution [redacted]. This will help us deliver our forward work program, which has several large, complex projects, on time and on budget. This OER will also expand our digital core capabilities to allow us to better optimise inventory, asset and workforce management.
Deliverables	A new project management solution Improved capability to optimise inventory, asset and workforce.
Objectives	Extensions to Oracle ERP allow us to add on standard capabilities such as EPM and Project Management capabilities, providing industry standard tools to the benefit of our workforce and asset/inventory management.
Main drivers of expenditure	Provide project management capability to enable us to deliver all types projects and scale.
Expenditure forecasting methodology	Based on historical estimates for similar activities.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $0.3M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 is $1.9M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	Improve capabilities and build on the current platform capabilities implemented in the 2018-23 regulatory period.
Benefits	Building on the 2018-23 regulatory period investment to cater to changing processes which will be reflected in implementing new capability.

Cyber Security (Recurrent and non-recurrent over 2023-28, expected recurrent in subsequent periods)

Table A2 - 8 Cyber Security summary

Cyber Security	
Description	Organisations like Transgrid are becoming more and more reliant on technology, adopting cloud services and including the automation of processes. With this greater adoption of technology, the cyber risks to the organisation increases. Cybersecurity related attacks have not only become more commonplace, complex and diverse, but also more damaging and disruptive. The Federal Government has new legislation creating an enhanced regulatory framework, via the Critical Infrastructure Bills, that increases the security and resilience requirements of Australia's critical infrastructure. Transgrid's security strategy had already resulted in the implementation of controls and capabilities to assist with managing the changing threat landscape. [redacted]

Cyber Security	
	[redacted]. [redacted] the Critical Infrastructure Bills will require us to achieve an AESCSF Security Profile (SP) rating of 3 and a MIL rating of 3. [redacted]
Deliverables	Our existing systems need to be refreshed or replaced with current technology in the 2023-28 regulatory period to meet new regulatory obligations to mitigate against emerging cyber security threats that have the potential for catastrophic failure of high voltage network assets and/or major loss of supply.
Objectives	We continue with running and maintaining the current investments in security and investigate and enhance a number of security solutions to assist in meeting the proposed legislative changes.
Main drivers of expenditure	The Critical Infrastructure Bills embed preparation, prevention and mitigation activities into the business-as-usual operation of critical infrastructure assets. The Critical Infrastructure Bills, together with AEMO's AESCSF, imposes positive security obligations and defines the cyber maturity level to be reached by us as a Critical Infrastructure Provider of National Significance. The NSW State Government legislated the Energy Legislation Amendment Bill 2021 (NSW Bill). It is anticipated that the NSW Bill will bring forward the AESCSF compliance timeframe requirements of part 2 of the Federal Critical Infrastructure Bill by 12 months. An overhaul of current cyber capabilities (process and technology) is required to align maturity across our cyber capabilities and to remain compliant with changing regulatory obligations.
Expenditure forecasting methodology	Expenditure forecast methodology is based on bottom up costs using the similar security implementation costs and 3rd party expertise as a reference.
Historic and forecast expenditure	The historical and forecast expenditure for 2018 to 2023 is $10.1M (Real $2022-23, excluding overheads). Forecast from 2023 to 2028 is $11.9M (Real $2022-23, excluding overheads).
Principal reasons for proposed expenditure	To continue to perform, maintain current security functions while also being able to enhance, upgrade and implement solutions to keep our ICT environment secure, to guard against malicious activities and meet current and future government mandated regulations.
Benefits	Compliance with new regulatory obligations including alignment with proposed levels of maturity (MIL ratings). Ongoing compliance with licence obligations. Avoidance of regulatory breaches and associated non-compliance fines and penalties. Avoidance of penalties associated with breach of licence conditions. Improved speed in identifying and remediating vulnerabilities, protecting our network and our customers.

Cyber Security	
	Reduction in risk of interruption of electricity supply to Eastern Australia due to cyber security incidents. Enabling more efficient, secure business outcomes by the adoption of cloud-based services and other initiatives.

Attachment 3 - ICT package interdependencies

For each ICT package, we have examined the importance of other ICT packages using the following definition:

- High – indicates that the OER is essential from a functional or compliance perspective to another OER
- Medium – shows that the OER is required to fully realise the benefits of an OER or would result in a change in scope of the OER
- Low – indicates that the OER is has a low level of dependency to another OER.

We note that the interdependencies between packages is not symmetric. For example, our staff can only gain access to bespoke applications and other applications if they have a laptop, which is part of the employee enablement OER. Given this, we consider that the bespoke application/application maintenance OERs are highly dependent on the employee enablement OER. However, the bespoke application and application maintenance OERs have minimal/no implications for the employment enablement OER.

The matrix below sets out the interdependencies between the different ICT packages.

Table A3 - 1 ICT package interdependencies

ICT Package	Importance of the package to the package on the left						
	Bespoke/ App maintenance	**Customer Safety and Support**	**Data and Decisioning**	**Employee Enablement**	**Infrastructure and Network**	**Operational Evolution**	**Cyber Security**
Bespoke / App maintenance		Low	Medium – benefits	High – functional	High – functional	Low	High – compliance
Customer Safety and Support	Medium – benefits		Medium – benefits	High – functional	High – functional	Low	High – compliance
Data and Decisioning	Low	Low		High – functional	High – functional	Low	High – compliance
Employee Enablement	Low	Low	Medium – benefits		High – functional	Low	High – compliance
Infrastructure and Network	Medium – Scope	Low	Medium – Scope	High – functional		Low	High – compliance
Operational Evolution	Low	Low	Medium – benefits	High – functional	High – functional		High – compliance
Cyber Security	Low	Low	High – functional	High – functional	High – functional	Low	

Attachment 4 - High level explanation of ICT capex projects in current regulatory period

The work packages we used in our 2018-23 submission is different to the work packages

The table below Table A4 - 1 shows how we have spent or plan to spend ICT capex over the 2018-23 regulatory period.

Table A4 - 1 Actual / estimated ICT capex over 2018-23 ($Million, Real 2022-23)

$Million, real 2022-23	2018-19	2019-20	2020-21	2021-22	2022-23	Average Annual	Total 2018-23
ICT							
Digital Enterprise	4.3	7.8	10.1	0.4	0.2	4.6	**22.8**
Digital Field Force	0.2	1.9	5.9	3.6	-	2.3	**11.6**
Intelligent Operations Centre	3.1	1.3	0.3	-	-	1.0	**4.8**
Intelligent Asset Design	0.5	1.2	0.5	-	-	0.5	**2.3**
Pervasive Security	3.7	4.3	2.5	-	-	2.1	**10.5**
Enterprise Analytics Platform	0.1	0.6	0.6	-	-	0.2	**1.2**
Information Infrastructure Refresh	7.2	2.3	(0.0)	-	-	1.9	**9.5**
Corporate Data Network Refresh	3.0	1.5	0.0	-	-	0.9	**4.6**
Total ICT	**22.2**	**20.9**	**20.0**	**4.1**	**0.2**	**13.5**	**67.3**

In completing Table 4-2, we applied the following assumptions to allocate our actual and estimated ICT capex over the 2018-23 regulatory period into our new ICT packages of work used to develop our forecast ICT capex over the 2023-28 regulatory period:

- Digital Enterprise and Digital Field Force packages significantly align with the Application Maintenance package because Digital Core applications are being upgraded and maintained.
- Intelligent Asset Design and Intelligent Operations Design packages completely align with the Application Maintenance package because our integration platform, Transgrid's Spatial System (TSS) and Electronic Document Management System (EDMS) applications are being upgraded and maintained.
- The Digital Field Force and Bespoke Application packages align, however there has been minimal investment in Asset Inspection Manager (AIM) and Public Easement Enquiry Management (PEEM) applications. The minimal spend from 2019 to 2023 is due to bespoke applications having a 10 year asset life, hence there will be a significant investment in bespoke applications during 2023 to 2028.

- The Customer Safety and Support package is new in 2023 because we are enhancing our customer engagement capability.
- Enterprise Analytics Platform package completely aligns with the Data and Decisioning package because they are building and maintaining data solutions. We will be investing in a data warehouse from 2023 which is reflected in the capital spend.
- Information Infrastructure Refresh package partially aligns with the Employee Enablement package as they are both replacing and maintaining user devices.
- Information Infrastructure and Corporate Data Network Refresh packages completely align with the Information and Network package except for the user device component as previously mentioned. There is a significant capex spend from 2023 because assets have been extended beyond their useful asset life during 2018 to 2023.
- Digital Enterprise and Digital Field Force packages partly align with the Operational Evolution package as they are enhancing and maintaining project management, Digital Core and revenue management capability.
- Pervasive Security and Cyber Security packages completely align as they are enhancing and maintaining security and compliance obligations.