Transgrid

People. Power. Possibilities.

Transgrid ICT Strategy

2021

Considerations and Guidance for ICT Investment

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Foreword

Purpose

This strategy outlines the drivers for investing in and managing information, communication and security technologies at Transgrid. Due to the pace of technological change, this document does not recommend specific solutions. Instead it provides principles to guide how Transgrid ICT should prioritise resources and funding to:

- Partner with the business to meet its regulatory obligations by providing the continued availability of high-voltage power for the National Electricity Market (NEM)
- Support the business with evolving ICT capabilities as the energy market transitions to renewables

In this regard, Transgrid ICT's obligations, in order of priority, are to:

1. Ensure the prudent continuity and preservation of business-enabling technology to support core business activities
2. Help the business to meet Transgrid's compliance and security objectives
3. Identify options to help the business adapt to expected changes in the energy market and support evolving activities
4. Leverage additional opportunities that advances in technology and information management may offer while also managing emerging risks

Business consultation

The ICT Strategy 2021 has been compiled through a series of business consultations to determine how Transgrid's current ICT capabilities will mature in light of organisational objectives and challenges. These consultation sessions included business validation activities to assess the continued need for existing technologies supporting key business activities.

Context for Consideration

Transgrid's ICT capabilities must evolve to deliver:

Secure, accessible modern communication and collaboration technologies

Changing work habits resulting from the Covid-19 pandemic have revolutionised the way our employees consume and share information, significantly increasing demand for improved modern communication and collaboration technologies. Employees expect these services to be available almost anywhere, any time, on any device – while still meeting security and compliance obligations.

Information and having access to quality data is at the core of improved collaboration and decision-making. But as the volume of data continues to grow, so too does its value and potential risk. Transgrid is obligated to protect the integrity of data from increasingly sophisticated and numerous cyber-threats, while also improving authorised employee access to data. Emerging technologies will be required to securely and effectively manage the increasing data volumes expected in the business.

Continuity of service by prudently replacing legacy technologies with modern platforms

Availability of the high-voltage transmission network depends on the availability of our staff, who in turn depend on the availability of ICT solutions to perform their work. However, many of Transgrid's existing ICT solutions, including infrastructure, application services and security, are based on aging, legacy technologies, some of which are out of vendor support. These technologies may no longer be appropriate to meet evolving national and state based policies and compliance obligations – especially as market demand for renewable power grows. Scalability and elasticity on modern platforms, such as cloud, offer our business room to adjust as market volumes and consumer needs dictate.

To preserve critical business systems, all future ICT investments must deliver secure, fit-for-purpose ICT services with a product life-cycle roadmap with a continued system refresh, mature risk indicators and appropriate security controls. Existing ICT products and services that cannot offer this assurance should be replaced with modern products that can support continuity and appropriately manage risk. If possible, products should also have a progressive feature pipeline and compelling value proposition.

Increased value, faster adaptation and streamlined costs from standardisation and reusability

All solutions considered must take a standardised enterprise architecture approach, (unless for exceptional and governed reasons), rationalising where possible to increase value, minimise overheads and reduce risk. Transgrid ICT must increase the reuse of functional capabilities right across the business, including in Operational Technology (OT). Benefits within one part of the organisation should always be made available to other sectors of the business. Thus, all appropriate recommendations, guidance and aspirations within this document are also available (with the appropriate controls) to OT teams.

Evolving ICT capabilities in a scarce skills market

Modern secure, scalable and highly-available technologies require new skills and capabilities to assure appropriate levels of supportability and responsiveness. Given the pandemic has profoundly limited the availability of certain ICT skillsets, this is an additional risk element that should be considered in all future solution selection, design and cost models.

Executive Summary

Transgrid's external environment is changing significantly, as the grid evolves from a coal-based to a renewables-based power system, creating new challenges and opportunities to improve the way we operate. ICT investment will be critical to give Transgrid & Customers access to modern digital tools and capabilities needed to continue to meet its regulatory obligations and lead the transition to a clean energy future.

This document sets the direction for strategic solutions and investment in ICT from 2021, leading into Transgrid's 2023 to 2028 regulatory period. The principles and guidance in this document are the result of business consultation, taking into account energy industry trends and technology advances. They also take their direction from the Transgrid Corporate Strategy and various business unit strategies.

The central objective of this ICT Strategy is to ensure continuity and build an increasing level of adaptability in ICT services to support Transgrid's ongoing and evolving transmission obligations. ICT must not only ensure continuity of services to operate the grid prudently, but it must also provide business with a cost effective, adaptive and resilient set of tools and capabilities to match new business conditions and needs.

ICT Strategic Focus 2021

To enable our organisation to deliver its corporate strategy effectively, the Transgrid ICT team in conjunction with our business has identified seven key criteria to guide us when selecting new technologies or replacing aging ICT assets. In the coming years, Transgrid ICT will focus on:

- Becoming resilient through the effective management and reduction of legacy risk
- Securing information assets to meet compliance obligations
- Building adaptability to facilitate the energy transition
- Unlocking scalability and opportunities through new technology
- Nurturing digital skillsets and increasing access to insights
- Facilitating toolsets for workforce mobility, productivity, engagement and increased sustainability
- Creating accessibility within OT for developments and advancements in ICT
- Building meaningful connections, transparency and engagement with our customers in the energy ecosystem

Our charter for this work will be to protect information and systems, invest in deliverability and compliance, apply an enterprise mindset and innovate to evolve.

The ICT solutions we invest in will be: connected, secured, value-led, insights driven and adaptable. This will help us to:

- Provide our staff with the necessary ICT support to perform their roles
- Meet our cyber security obligations
- Enhance our digital capabilities in key priority areas
- Improve transparency, safety, sustainability and customer connections
- Make best-fit solutions available to all teams within Transgrid

Transgrid's Corporate Strategy

Strategic narrative

Transgrid's external environment is changing significantly, creating opportunities to improve the way we operate.

The grid is evolving from a coal-based to a renewables-based power system, against the backdrop of a rapidly changing regulatory and political environment. As a result, major transmission projects are required to support the future grid and new generation (including growing renewable generation sources) will need to connect into the grid. At the same time, consumers remain at the forefront of the energy debate, with Transgrid focused on helping to achieve industry-wide efficiencies to improve end-user outcomes.

In response to these changes, Transgrid has defined the following set of strategic pillars / priorities:

1. Advocate for the energy system of the future.

- Deploy our engineering, regulatory and policy expertise to advocate for a sustainable energy future

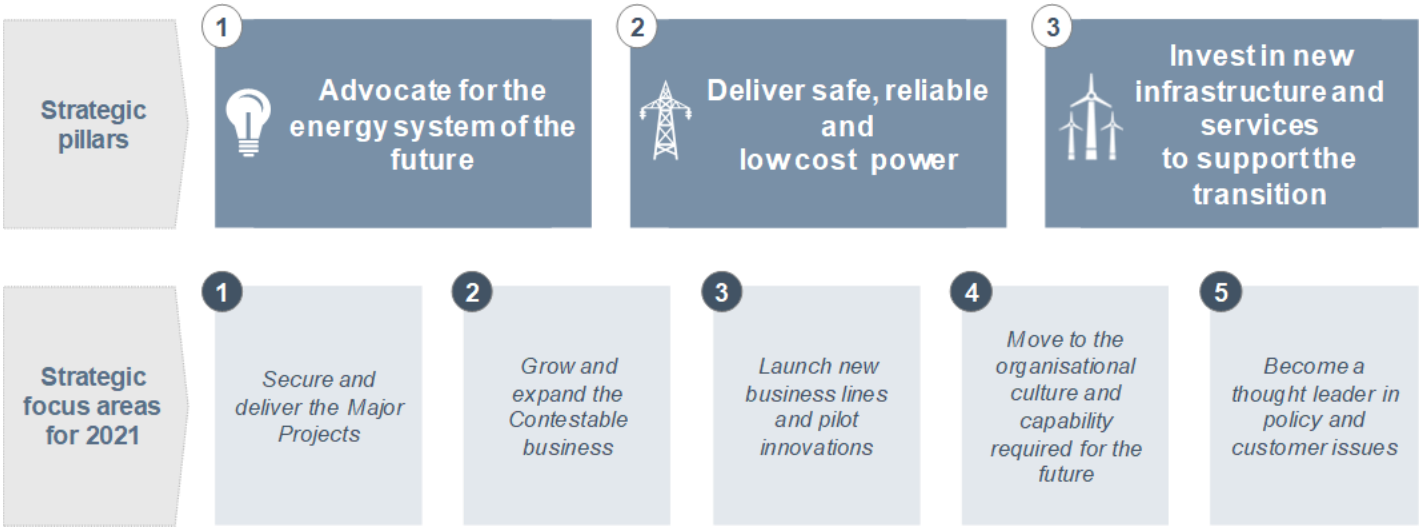
2. Delivering safe, reliable and cost-effective power.

- Maintain high standards of system reliability as the system transitions, for the benefits of consumers, while in turn ensuring safety is paramount for our workforce and the public

3. Invest in new infrastructure and services to support the energy transition.

- Pursue new transmission projects, including interconnectors and renewable energy zones
- Capitalise on new growth opportunities that align with our competitive advantage

Transgrid 2021 Corporate Strategy



Source: [Transgrid Corporate Strategy 2021]

IT linkage to Transgrid's strategic pillars

To support Transgrid's strategic corporate pillars ICT will:

1. Assist our business to advocate for the energy system of the future by providing access to efficient, transparent and collaborative toolsets and platforms that permit improved engagement within the energy sector, including with the energy regulator and appropriate government agencies.

2. Support the delivery of safe, reliable and low-cost power by ensuring priority ICT service availability, reliability and security. Ensure the business can effectively scale key systems in a prudent manner, using the most assured and cost effective paths to increase safety and optimise value for consumers, the energy value-chain, and for our business, partners and employees.

3. Ensure all new technology investments are scalable and adaptive to business change as Transgrid invests in new infrastructure and services to support the energy transition.

Transgrid's Strategic Focus Areas

1. Secure and deliver major projects

Position Transgrid to lead the energy transition through effectively delivering and managing large-scale transmission projects.

2. Grow and expand the contestable business

Grow the connections business to help support the pipeline of new generation coming online and move into supporting service areas

3. Launch new business lines and pilot innovations

Exploring, developing and incubating strategic growth options and innovations from new products or new markets aligned to the energy transition

4. Move to the organisational culture and capability required for the future

Effectively scale systems and processes and grow workforce capabilities to deliver on our growth agenda. At the same time, create an agile, customer-centric and high performing culture and support our people throughout the changes occurring

5. Become a thought leader in policy and customer issues

Use our know-how and expertise to drive optimal outcomes for consumers throughout the energy transition.

IT linkage to Strategic Focus Areas

To support Transgrid's Strategic Focus areas, ICT will provide modern tools and capabilities to help build a progressive, high-performing culture focused on growth and innovation. This includes providing technologies that enable our employees and workforce to embrace modern ways of working and increase both collaboration and the ability to adapt and pivot to emerging challenges. Legacy toolsets constrain our business from being effective and ultimately reduce time to value or time to outcome. Future investments must focus on overcoming toolset limitations and encouraging modern, outcome-focused work practices.

Technology must encourage experimentation and innovation to help meet the challenges of adding increasing renewable generation to the grid. This will require on-demand, pay-per-use solutions to help the business test concepts and run pilots. We recommend increasing accessibility to cloud services (including IaaS, PaaS and SaaS) under secure constructs to allow our business to test the feasibility of different options before making major investment decisions.

Transgrid's Business Drivers

Business narrative

As Australia moves towards net zero carbon outputs for 2050 and makes advances towards the 2030 interim reduction targets, Transgrid's business drivers include:

- The continuing pace of the energy transition, creating both opportunities and threats for Transgrid's business
- Regulatory and policy headwinds threaten the investment appetite of the Prescribed business, requiring new strategic responses
- Contestability and competition are increasing across Transgrid's regulated and non-regulated businesses
- Transgrid's culture and capability are not yet optimised to support the execution of its emerging strategy.

The rapidly changing energy environment is creating promising strategic growth opportunities, but there is a short window for Transgrid to pursue them, making now the time to invest in synergistic growth and innovation. The most compelling characteristics of the energy market transformation include:

- A new smart energy ecosystem putting customers at the heart; within which both networks and customers will deploy smarter management systems.
- The accelerating change in generation mix as distributed renewables replace centralised thermal generation. This will increase demands for connection capacity at previously remote parts of the network.
- Advances in battery storage technologies, which will increase energy storage potential.

- Requirements for large-scale storage through batteries and/or pumped storage place additional requirements on the capacity or components of the network.

The pace and scale of these trends will depend on a combination of economic, government policy and technology drivers. Whatever the outcome, we can assume the future of energy supply will be more complex, smarter, greener, with more local embedded generation and storage throughout the system.

As increasing rates of technological advancement shape the grid and in light of growing cyber-compliance obligations, Transgrid will need a rapidly evolving technical capability to respond to consumer needs and market dynamics.

Thus, ICT must not only ensure continuity of services to operate the grid prudently, but it must also provide business with a cost effective, adaptive and resilient set of tools and capabilities to match new business conditions and needs.

Strategic Charter for ICT

From 2021, four strategic themes will underpin our charter to guide future investment in ICT:

1. **Protect information and systems** – We are an essential services provider with responsibility for sensitive data. We will take appropriate steps to protect the confidentiality, integrity, authenticity, availability and reliability of our information and systems.

2. **Invest in deliverability and compliance** – We will prioritise and justify every investment by deliverability and compliance. This will ensure we meet the expectations of our customers, community and security holders to allocate our resources efficiently and prudently.

3. **Apply an enterprise mindset** – We will prudently invest in our future performance so we can meet the needs of the energy market and its customers. Our approach will reduce the technology risk profile and provide the business with capability to adapt to the requirements of the energy market.

4. **Innovate to evolve** – We will prudently invest in recognising, developing and optimising technology solutions that advance our employees, our organisation and the services we provide.

ICT Objectives

Effective investment in ICT is required to ensure our business continues to operate reliably and we can appropriately service business needs during the energy transition. Our future investment will focus on the following objectives:

- **Provide our staff with the necessary ICT support to perform their roles** – Staff need fast and flexible access to our online services and applications to help them give great customer service and fulfil our obligations to consumers and the NEM.

- **Meet our cyber security obligations** – The maturing cyber security landscape, including the proposed 2021 Federal government Critical Infrastructure Bill, requires us to enhance our cyber security capabilities. Threat mitigation is imperative, including ensuring that all applications and service are able to receive vendor support and security updates.

- **Enhance our digital capabilities in key priority areas** – In response to industry drivers and business needs, all future ICT investments should search for improved capabilities to effectively deliver our forward work program and support our strategic corporate objectives.

- **Improve transparency, safety, sustainability and customer connections –** ICT investments must improve transparency and engagement with customers and stakeholders while supporting safety and sustainability.

- **Make the best-fit solutions available to all teams within Transgrid** – The evolution of converging capabilities between OT and IT means that advances in the corporate business need to be available (with the appropriate security controls) to Core Transmission Network teams. For example, collaborative endeavours on ‘systems of innovation’, such as modelling out Digital-Twins to pre-empt the impact of renewables in the grid, should support accelerated benefits in OT.

The following characteristics of ICT solutions will underpin our objectives:

- **Connected** – ICT seeks to further connect consumers, our employees and energy market stakeholders with quality information to progress the energy transition.

- **Secured** – ICT must evolve appropriate security controls 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 including those defined in the Critical Infrastructure Act 2018 (CI Act), the proposed Critical Infrastructure Bill 2021 and AEMO's Australian Energy Sector Cyber Security Framework (AESCSF).

- **Value-led** – ICT will increase the value derived of ICT, through standardisation and reusable components, to improve efficiency. Rather than the previous approach of using point solutions (solving one business problem at a time), ICT will deliver value by pursuing a modern, agile, flexible ICT environment that aspires to solve a number of problems by uplifting capability across the business.

- **Insights-driven** – In a smart grid, data is a strategic asset. ICT seeks to provide Transgrid's decision-makers with quality, integrated data offering timely, consumable and contextual insights.

- **Adaptable** – Agile ICT helps our business to adapt as we address risks and uncertainties driven by industry changes and technology disruptions. Future ICT investments must be able to prudently scale and evolve to support our journey in the transitioning energy market.

Strategic ICT Principles

The technology-based guiding principles in this section were developed in direct response to the evolving energy marketplace and rapid advances in technology innovation. To enable our organisation to deliver targeted outcomes effectively, the Transgrid ICT team in conjunction with our business has identified seven key criteria to guide us when selecting new technologies or replacing aging ICT assets:

Principle 1	**Risk Managed Resilience**
Objective:	Become resilient through the effective management and reduction of legacy risk
Methods:	• ICT solutions must align with and contribute to the increasing maturity of our risk culture • Increased risk tracking will be prioritised within investments to effectively manage and mitigate priorities linked with aging ICT asset modernisation • Solution design must ensure minimum business impact in the event of an IT service disruption or change

Principle 2	**Secured Compliance**
Objective:	Ensure the security of information assets to meet compliance obligations
Methods:	• ICT will improve the visibility and traceability of our security posture • Investments will aspire to tangible improvements in our compliance maturity • All solutions will be secure by design and provide traceability on usage • All investments will adhere to ISO27001 and ISO55001 guidelines

Principle 3	**Progressive Adaptability**
Objective:	Build adaptability to facilitate the energy transition
Methods:	• ICT will consider and, where possible, enable progressively adaptive technologies to better facilitate the energy transition • All ICT solutions will be flexible and progressive to prepare our workforce for future capabilities and emerging industry demands • ICT solutions will encourage prudent iterative evolution and value driven innovation to address the challenges emerging from the current unparalleled rate of change

Principle 4	**Value Led Scalability**
Objective:	Make growth and scalability more cost effective through new technology
Methods:	• ICT investments will provide options to improve efficiencies while scaling for increased use • ICT solutions will consider the potential for re-use, minimising the need for recurring foundational investment

Principle 5	Informed Capability Modernisation
Objective:	Give the business data-based insights and the digital skills and tools to interpret them
Methods:	• Data will be regarded as a strategic asset to inform prudent, evidence-based decisions within our business • Where feasible, ICT will facilitate increased access and security for cloud based solutions. These models offer cost controls facilitated by pay-for-use and minimise time and risk in developing or deploying traditional solutions • Given technology will be an increasingly important enabler, goals will be set to improve our technology and digital capabilities in alignment with modern product strategies

Principle 6	Productive and Sustainable
Objective:	Provide modern toolsets to support workforce mobility, productivity, engagement and increased sustainability
Methods:	• ICT will provide employees with the modern toolsets they expect to improve engagement and collaboration and ensure business resilience during social disruption • ICT will advocate for increased sustainability and evangelise sustainable working practices • ICT solutions will minimise power consumption wherever possible, limiting waste and ensuring ethical and sustainable choices are prioritised
Principle 7	Transparent and Engaged
Objective:	Build meaningful connections, transparency and engagement with our customers and partners in the energy ecosystem
Methods:	• ICT solutions will leverage lessons learned in the broader energy industry as we partner for more standardised outcomes • Given increased visibility and transparency is now a market expectation, ICT will improve its communication and engagement within our company, the sector and with consumers

The efficient delivery of ICT services, together with the innovation cloud services can provide, will be critical to successfully delivering against these desired outcomes.

Focused ICT Category Criteria

Cyber Security Technologies

All investments in Cyber Security will:

- Secure company assets
- Adhere to ISO27001 specifications
- Protect Transgrid data
- Ensure compliance
- Protect the NEM, business and customer interests.

Application Management

Commercial Off-the-Shelf Software

Investments in any revised or refreshed COTS software must:

- Improve the customer and staff user experience when working with Transgrid applications
- Ensure ongoing supportability, including patching and version updates
- Offer adaptability to meet emerging business needs
- Deliver vendor released enhancements via a strategic product roadmaps
- Drive towards increased symmetry with energy industry participants
- Remove legacy constraints

Bespoke Applications

Maintenance, development and refresh of Transgrids bespoke applications must:

- Improve the customer and staff user experience when working with Transgrid applications
- Ensure ongoing supportability and vulnerability management of the platform and code
- Build solution adaptability to accommodate rapid market changes
- Focus on differentiation, where non-differentiating replace with COTS products
- Constantly track, own and manage technology debt and remove existing risks

Infrastructure Management

Physical infrastructure, including data center technology, servers, storage, network communications and cloud hosted infrastructure, must:

- Track and address all aged platform and legacy system risks
- Ensure business critical systems offer inherent solution resilience
- Advocate for diverse paths to support increased availability
- Provide scalability to enable growth, and contract to remove cost burdens when not in use
- Offer choice for different business use cases on either physical hardware, virtualised hardware or cloud options
- Provide configurability to modernise performance in accordance with demand

Employee Technologies

Technology directly provided from ICT to employees must:

- Facilitate improved modern working practices allowing ease of use
- Create increased employee flexibility to work remotely due to pressures from the pandemic and employee expectations
- Advocate for a positive productive employee experience
- Encourage adoption of modern toolsets to stimulate modern mindsets and innovation

Enterprise Application Services

Scaled enterprise solutions, including our ERP, Asset Management, Worker Safety systems, must:

- Be hosted on modern scalable platform-based products where possible to address aged system risk
- Ensure commercial support arrangements include version maintenance obligations
- Leverage SaaS products with actively managed product and enhancement roadmaps relevant to business goals
- Offer adaptability where the business ideally pays for essential and used items only including volumes of activity
- Ensure connectedness to the energy ecosystem, including other utilities where we can benefit from their progress and knowledge
- Remove the constraints inherent in existing legacy systems

Data Management

Given data is increasing becoming a strategic enabler, we must:

- Advocate for improved data custodianship, governance and quality
- Focus on increasing opportunities for enabling increased insight and expediting decision-making
- Underpin broad organisational goals to champion accessibility, truth and accuracy
- Promote a modern, fact-based digital culture

Stakeholder Engagement Platforms

With customers at the core of our industry, we must:

- Create increased opportunities to demonstrate advocacy and care for our customers and stakeholders
- Improve customer transparency and visibility of Transgrid's activities through online channels
- Ensure systems prioritise employee, partner and customer safety
- Facilitate effective and simplified collaborating with energy ecosystem participants

Appendices – Target ICT Investment Timings

Security initiatives	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Package 1: Situational Awareness and Incident Response.							
Package 2: Identity and Access Management							
Package 3: OT Integration							
Package 4: Threat and Vulnerability Management, including External Dependency Management.							
Package 5: Workforce Management							
Package 6: Application Security Integration							
Operational Evolution	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Digital Core Phase 1							
PPM/PDGS Replacement							
WAM & Inventory							
Digital Core Phase 2 Major Upgrades							
Bespoke Application Refresh	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Design and Deploy Devekopment Tools							
Development and Deployment							
Application Maintenance	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Design and Deploy							
Customer Safety and Support	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Design and Deploy							
Infrastructure and Network	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Project - Initiative A - CDN Firewall Refresh							
Project - Initiative B - Refresh CDN Campus network							
Project - Initiative C - Refresh Substation CDN Infra							
Project - Initiative E - Refresh Proxy Server Infra							
Project - Initiative F - Refresh Unified Comms Infra							
Project - Initiative G - Refresh BIG IP Load balancer Infra							
Project - TIER 4 Upgrade							
Project - Backup Platform (Backup Storage and Infra)							
Project - Microsoft Operating System Upgrade (2012+2016)							
Project - Hyper converged Infrastructure Hardware Upgrade 2023							
Project - Hyper converged Infrastructure Hardware Upgrade 2024							
Project - Hyper converged DMZ Infrastructure Uplift							
Project - VMWARE							
Project Citrix XenApp							
Project - Managed Print Services (FUJI XEROX)							
Project - Mobile Iron to Intune							
Project - Windows Active Directory Re-architecture							
Project - Migration of 10 Applications to the Cloud							
Employee Enablement	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Recurrent Device expenditure							
SharePoint Online							
Office 365 Collaboration							
ISDN to SIP Migration							
Customer Safety	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
Replace existing Customer Safety CRM solution							
Data and Decisioning	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
R&A Core							
Data Ingestion							
ORA Decommissioning							
Data Governance							