ElectraNet

TECHNOLOGY STRATEGY

ElectraNet

July 2020

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1   Executive Summary

The energy industry is in a period of unprecedented transformation, driven by social, political, environmental, economic and technological factors that are changing the way we generate, store, transmit, buy and consume electricity around the world.

South Australia is at the forefront of this transformation through its leadership in generation from renewables and grid scale storage, as well as market and regulatory reforms to deliver safe, reliable, affordable energy to customers.

This has required, and will continue to demand, innovation in the transmission network, as the upstream and downstream impacts of these changes are felt in the electricity supply system, many of which will be underpinned – or even made possible – by developing and maturing technologies such as process automation, advanced analytics, remote sensing and the Internet of Things (IoT), to name a few.

ElectraNet requires a Technology Strategy that plots a course for the technology changes that will be required to support the business as it transforms to meet the energy needs of its customers into the future.

The Technology Strategy

This Technology Strategy covers the period from 2020 (today) to 2028 (the end of the next regulatory period). It outlines ElectraNet's technology vision and objectives, in line with its Network Vision.

It proposes three time horizons, to deliver the required technology maturity to serve the needs of the business in 2028:

- **Initiating (2020-2021)**
  - o   Key architectural, governance and financial management practices put in place
  - o   Detailed Technology Roadmap and portfolio developed

- **Enabling (2021-2023)**
  - o   Foundation data, integration, geographic information system (GIS) and cybersecurity enablers put in place to fully support current business practices
  - o   Targeted proof of concepts and field trials of digitisation and IoT technologies to build knowledge and create a platform for future optimisation (and enhancement) of the network

- **Integrating and Optimising (2023-2028)**
  - o   Enhancement of data, integration, GIS and cybersecurity platforms to build new capabilities and drive future business operations
  - o   Scaling of digitisation and IoT technologies to become core to operational processes and maximise efficiencies

The Technology Strategy identifies five key technology domains – or "focus areas" – that will underpin ElectraNet's business operations, and its vision of an efficient, reliable, secure transmission network for South Australia:

- **Digitisation**
- **Data**
- **Integration**
- **Internet of Things**
- **Cybersecurity**

For the Technology Strategy to succeed, ElectraNet must also continuously and strategically invest in technology skills and capability especially in the areas listed above. This must be done across the business, not just in the technology group to drive cultural change based on a collaborative and shared understanding of technology and its value to ElectraNet.

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2   Introduction

2.1 Industry Context

The energy industry stands on the cusp of a period of unprecedented transformation, influenced by external social, political, regulatory, and environmental factors, as well as the rapid pace of technological change.

While ElectraNet's mission and purpose as the owner of South Australia's high-voltage electricity network - and its commitment to its customers to deliver safe, affordable and reliable transmissions services - remains clear, it operates in an increasingly volatile and complex context.

Whether this be increasingly activist policy making from governments seeking to legislate outcomes for consumers on decarbonisation, reliability and price; centrally driven regulatory reforms to open the market to new energy sources and providers; long term changes in consumer behaviour or increasingly unpredictable and volatile climate events; ElectraNet will be expected to plan ahead to respond to these challenges, while continuing to meet its commitments to its shareholders, customers and the South Australian community.

Exhibit 2.1 Impacts of industry trends on energy transmission companies
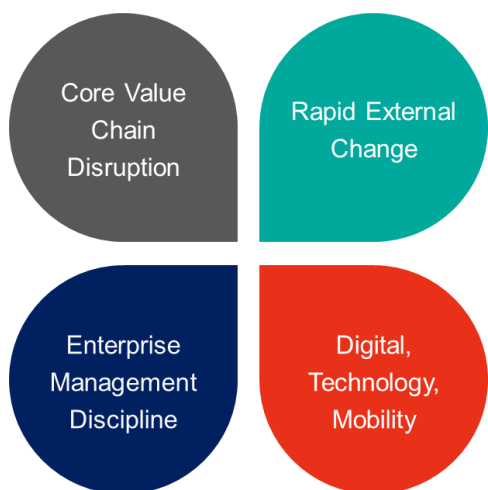
- **Core value chain disruption** either side of ElectraNet, in both generation and distribution, as well as consumer choices

- **Rapid external change** in social, political, environmental and economic factors

- **Enterprise management discipline** becoming an ever-increasing focus to deliver safe, affordable, reliable energy and stable shareholder returns

- **Rapid technological developments** opening new opportunities, but also creating new challenges in terms of integration, security and service management

ElectraNet will continue to play a fundamental role in providing security and reliability of supply; facilitating market competition; protecting the safe operation of the grid and appliances; ensuring continuous supply and market access for customers who wish to sell power back to the grid; despite the increasing complexity and interconnectedness of the environment around them.

This environment requires ElectraNet to create and maintain the highest levels of organisational responsiveness and agility and the Technology Strategy has been designed with this in mind.

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2.2 ElectraNet Business Drivers

ElectraNet will continue to pursue its aspirational goals in response to these market demands:

Aspirational Goal	Description	Possible Implication
Customers First	Our customers are at the heart of our decision making and we are trusted to deliver affordable and reliable energy solutions	Customer preferences and behaviours may change and their expectations on reliability and price are likely to increase
Operational Excellence	We are Australia's leading asset and network manager, delivering for the long term. Continuous improvement and quality underpin all that we do	Need to maintain safety, reliability, and security in increasingly complex and dynamic operating environment
Enabling Communities	We proudly support the communities in which we operate. We value landholder relationships and respect both the natural and cultural environments	Continue to serve the needs of all communities and maintain social license to operate
Driving Value	Our business is efficient, innovative and sustainable. We deliver value for our customers, shareholders and community	New challenges and opportunities for secure, efficient and cost-effective operation of the grid
Powered by People	We keep our people safe from harm every day. We employ great talent and invest in their future by helping them reach their full potential	Continue to invest in the people and skills that will enable ElectraNet to continue to thrive and operate safely into the future

2.3 Network Vision (2016)

ElectraNet's *Network Vision* describes how it intends to deliver a transmission network that is fit for the future and responds to these demands as it supports ElectraNet's corporate vision. It identifies a set of directions and priorities that will inform its vision and planning for the network, underpinned by four key strategic insights:

Exhibit 2.2 Network Vision Strategic Insights

1. The transmission network will continue to play an important role into the future to support safe, reliable and affordable electricity supply

2. The ongoing uptake of distributed energy resources by customers is changing the role of the grid

3. The generation mix is changing, creating new challenges for the secure and reliable operation of the grid

4. New technologies are changing the way some network services can be delivered

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The Network Vision provides the framework for how ElectraNet intends to deliver its operational imperatives as it continues to monitor emerging industry trends and developments. The primary role of this Technology Strategy in this context is to articulate a set of strategic technology choices that will support ElectraNet's operating model to deliver this vision.

When the Network Vision is refreshed, this Technology Strategy ought to be iterated to maintain alignment with it.

3   Introducing the Technology Strategy (2020-2028)

The purpose of this Technology Strategy is to describe a vision and strategy for technology that:

- guides ElectraNet's technology investment decisions, ensuring that we invest in the right things, in the right order, for the right reasons
- supports the business in adapting to emerging and future changes to our operating environment and competitive landscape
- informs technology proposals that will form part of a future regulatory investment proposal to the Australian Energy Regulator (AER)

The intention is to set a clear direction and basis against which emerging proposals for technology investment can be assessed.

The Technology Strategy seeks to connect the strategic imperatives and business drivers, via the priorities of each business function, to allow proposed technology initiatives to be prioritised, co-ordinated and resourced efficiently, to deliver maximal stakeholder value for planned investments.

3.1 Time Horizon

The time horizon for the Technology Strategy encompasses the remainder of the current regulatory period (to 2023), and the whole of the following regulatory period (from 2023 to 2028). It recognises that several technology initiatives are currently 'in flight' and form part of the approved regulatory investment proposal for the current period (from 2018 to 2023).

3.2 Scope

The scope of this Technology Strategy covers all technology and systems including those managed and operated outside of the Technology Group within Corporate Services.

This Technology Strategy is premised on an enterprise wide governance arrangement to manage all technology solutions.

Where appropriate, interdependencies and touchpoints between different technology domains are referenced within the Technology Strategy for the purpose of alignment and to encourage efficient co-operation between these domains.

Examples of these domains include:

- Core business IT (finance, human resources, supply chain)
- Asset management
- Works management
- Project management
- Geographic Information Systems (GIS)
- Operational Technology, including Supervisory Control and Data Acquisition (SCADA)

- Secondary Protection Systems

- Telecommunications

- Cybersecurity

3.3 Business Maturity Roadmap (2023)

The Business Maturity Roadmap (and supporting Capability Model) incorporates 25 inflight or approved initiatives and forms part of ElectraNet's Business Plan. The roadmap encapsulates the activities that will be undertaken to achieve ElectraNet's corporate goals and objectives to 2023.

It is likely that the Technology Strategy will have multiple touchpoints with the Business Maturity Roadmap and therefore its initiatives have been reviewed to ensure the Technology Strategy is aligned. Progress made by the Roadmap will be monitored to ensure the Technology Strategy is planned and enacted in a way that is consistent with the Roadmap.

3.4 Cybersecurity Strategy

ElectraNet is on par with industry peers in relation to its cyber security maturity and recognises the growing cyber threat landscape. To tackle this, ElectraNet is developing a Cybersecurity Strategy, with the following objectives:

- Maintain robust risk mitigation and impact reduction practices commensurate with the risk appetite of our key stakeholders

- Provide a mechanism for continual improvement of the cyber security practices at ElectraNet

- Streamline security practices to minimise the operational impact on our people, enabling them to focus on what matters most

- Ensure the safety of our people, our customers and the general public, and protect the information they entrust to us, in alignment with legal, regulatory and contractual requirements

- Lead the industry through demonstrating a focus towards innovative approaches to security practices

- Provide assurance to the South Australian community and other interested parties of the reliable supply of electricity services

- Maintain the reputation of ElectraNet and our related parties

The Technology Strategy is a key enabler of these Cybersecurity objectives, and there are several areas of mutual interest between the two. These include, among others:

- Remote sensing

- Grid communications

- Asset visualisation

- Data and technology infrastructure

- Extended electricity value chain and suppliers

- Training and skills development

The Technology Strategy also highlights high level objectives and milestones for Cybersecurity, as these underpin characteristics required to achieve the desired level of technology maturity described in this Strategy.

Several joint review sessions have been held with the Cyber Security Manager and Business Resilience team during the development of the two strategies, to ensure alignment between them.

This should continue during the implementation of the strategies to ensure this alignment is maintained.

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4 Aligning the Technology Strategy with the Network Vision

To ensure alignment with the Network Vision (2016), the Technology Strategy was developed using the energy industry Smart Grid Maturity Model (SGMM).

The SGMM allows a common way of describing how ElectraNet intends to increase organisational maturity over the next eight years in line with the Network Vision.

The following section describes how aspirational business maturity was translated into the basis of the Technology Strategy by explaining:

1. the SGMM and how it aligns to the directions and priorities of the Network Vision

2. how target levels of maturity for the business domains and technology were determined

3. how these target maturity levels form the basis of the Technology Strategy

4.1 The Smart Grid Maturity Model

The SGMM was developed by Carnegie Mellon University's Software Engineering Institute (SEI) in conjunction with electric power utilities.

Exhibit 4.1 shows that the model comprises of:

- eight business 'domains' that incorporate ElectraNet's key business functions

- five maturity 'levels' for each of those domains

Exhibit 4.1 Smart Grid Maturity Model
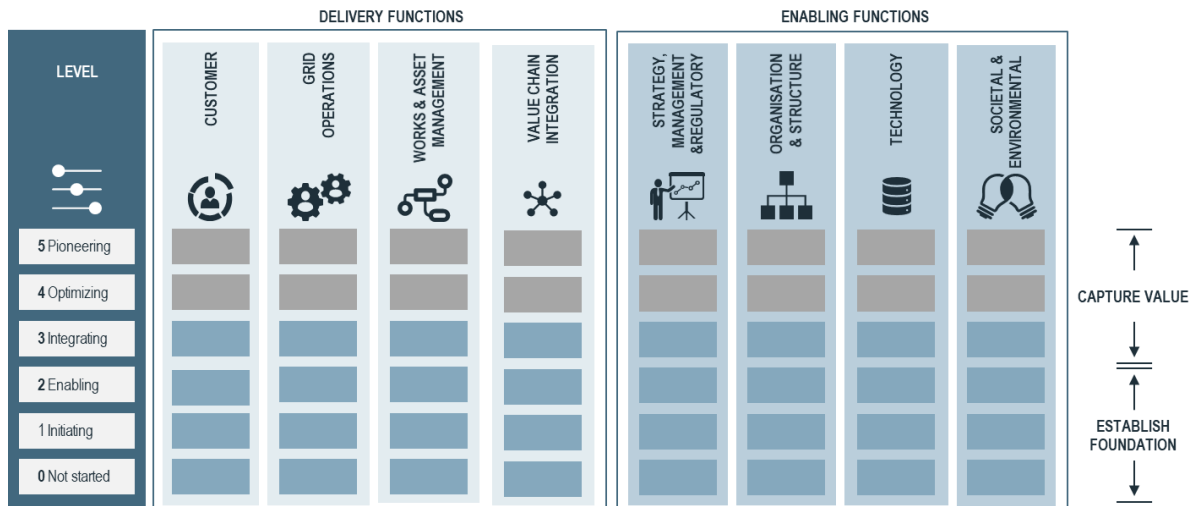
The model has been aligned to the Network Vision. As shown in exhibit 4.2, the Network Vision's directions and priorities are nested within each of the domains of the SGMM to evidence how they align.

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Exhibit 4.2 Aligning the SGMM to the Network Vision *(see Exhibit 4.1 for full domain titles)*
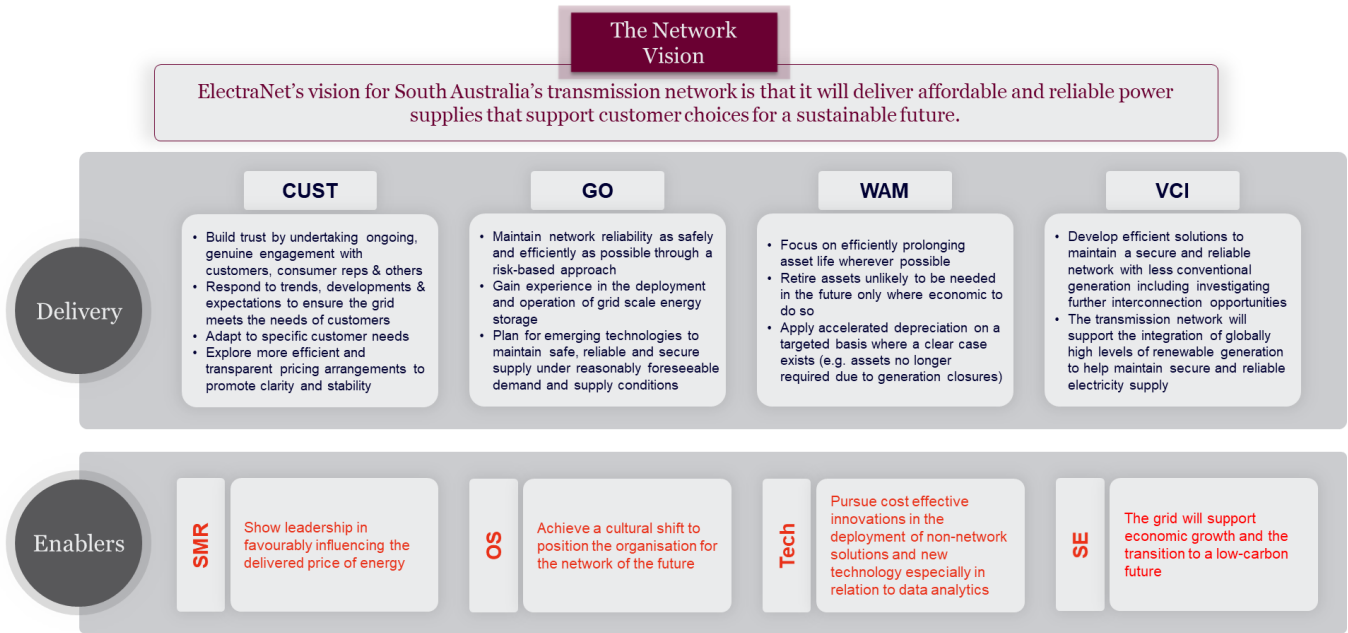
4.2 Determining Business and Technology Maturity

Once alignment with the Network Vision was established, a current state assessment was conducted across the business domains followed by a future state scoping exercise. This established the desired level of maturity that the business wants to achieve over the next eight years (using the SGMM) and equally what level of technology maturity is required to support this.

4.2.1 Current State Assessment (2020)

The current level of organisational maturity in each of the SGMM domains was determined through a documentation review and working sessions with nominated representatives of each business function.

In relation to the Works and Asset Management domain, a recent maturity review conducted by AMCL[1] was used as a basis to evidence maturity in that domain. See appendix A to understand how the AMCL maturity model aligns to the SGMM[1].

In several cases, it was identified that a lack of maturity in the technology domain was a key constraint in the other business functions' ability to demonstrate the characteristics required to achieve higher levels of maturity. The assessment of the technology domain resulted in the lowest maturity level rating (level 0) because fundamental technology artefacts were not evidenced.

The outputs of the current state assessment are described in detail in the supporting deliverable *ElectraNet Current State Insights*,[2] which provides the baseline (or starting point) for this technology strategy.

4.2.2 Future State Insights

A Future Cast workshop was then held with nominated representatives from each business function on 18th March, 2020, to determine the desired level of maturity in each of the SGMM domains that ElectraNet should seek to achieve by the end of the next regulatory period in 2028. These stakeholders are shown in appendix C.

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[1] Asset Management Consultancy Limited

[2] ElectraNet Current State with Insights v1.0

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The outcome of the workshop is shown in exhibit 4.3 which illustrates the desired levels of maturity across the eight domains from today's current maturity, to aspirational 2028 maturity.

A description of the activities undertaken in the workshop can be found in the supporting deliverable *ElectraNet Journal*,[3] and a detailed analysis of the outputs of this session in the *ElectraNet Future State Insights[4]* report.

Exhibit 4.3 Desired level of maturity in each organisational domain of the SGMM by 2028
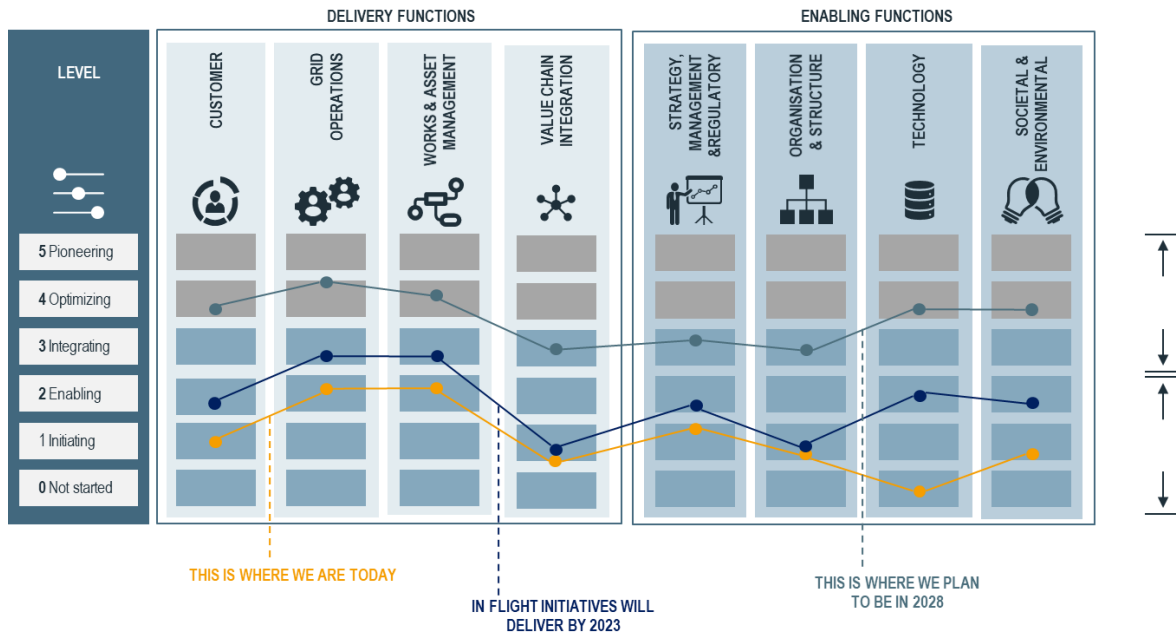
The outputs of the Future Cast form the basis for this technology strategy, by articulating the level of maturity that each business function wishes to achieve by the end of the next regulatory period, as well as the technology characteristics that they believe will be necessary to support this.

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[3] ElectraNET Journal final

[4] ElectraNet Future State Insights v1.0

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4.3 2028 Business and Technology Characteristics

The characteristics in the table below are determined using the desired level of business maturity and articulates how technology will support the business across each domain.

SGMM Domain	2028 Business Characteristics	Key Technology Characteristics
All Domains	• **An organisation configured for the future** • **Evidence based decision making, powered by data**	• **The right data, in the right systems with proper training & skills to enable the best decisions**
Strategy, Management & Regulation	• A shared Network Vision • A clear organisation governance framework	• A vison & framework visualised & communicated via a common online platform e.g. a defined KPI Dashboard
Organisation & Structure	• An empowered & skilled workforce whose performance incentives are aligned to the Network Vision • Organisational integration	• Agile, flexible & secure solutions that talk to each other & allow collaboration across teams • Performance data clearly visualised & accessible
Grid Operations	• Efficient, reliable & intelligent grid operations • Real-time event management	• Automated network operations including no operator switching, automatically planned outages & plant optimisation through automated maintenance plans • Real-time data via a network of smart devices e.g. sensors
Works and Asset Management	• Asset management excellence • Asset lifecycle optimisation	• Automated data capture & condition-based maintenance • Visualisation of defects & work in progress • Access to timely & quality data for all key decision makers
Customer	• Delivering value & an excellent service	• Empowered customers who can access their energy data & manage their energy consumption. They are also enabled to manage & understand their environmental & societal footprint (links to SE)
Value Chain Integration	• ElectraNet positioned at the centre of the value chain	• Real-time data from across the value chain that can be analysed
Societal & Environmental	• An improved environmental & social footprint	• Improved field inspection & land management through new technologies e.g. Lidar, VR, AR • Integration of incident management data & processes

The technology characteristics above have been grouped into themes that form the basis of the Technology Strategy.

The Strategy intends to bridge the gap between the current level of organisational capability in each SGMM domain and the desired target state in 2028.

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5 The Technology Vision

"Technology will be a strategic enabler for ElectraNet by supporting maturity across the business to achieve the corporate vision backed by the Network Vision. It will deliver the right data, in the right systems with the training and skills to enable the best decisions"

This supports:

The ElectraNet Vision:

"By 2025 we are an Australian leader in enabling the transition to a low carbon economy by expanding our role as a provider of network solutions."

5.1 The Levels of the Technology Strategy

Supporting the Technology Vision are three strategy levels that define how the Technology Strategy is structured and what it covers. Exhibit 5.1 illustrates how the Vision is:

- driven by three key technology **objectives**
- underpinned by a set of technology **principles**.
- organised into technology **themes** that are defined as either enablers or focus areas
- delivered sequentially through three high level technology **time horizons**

Exhibit 5.1: Technology Strategy Levels
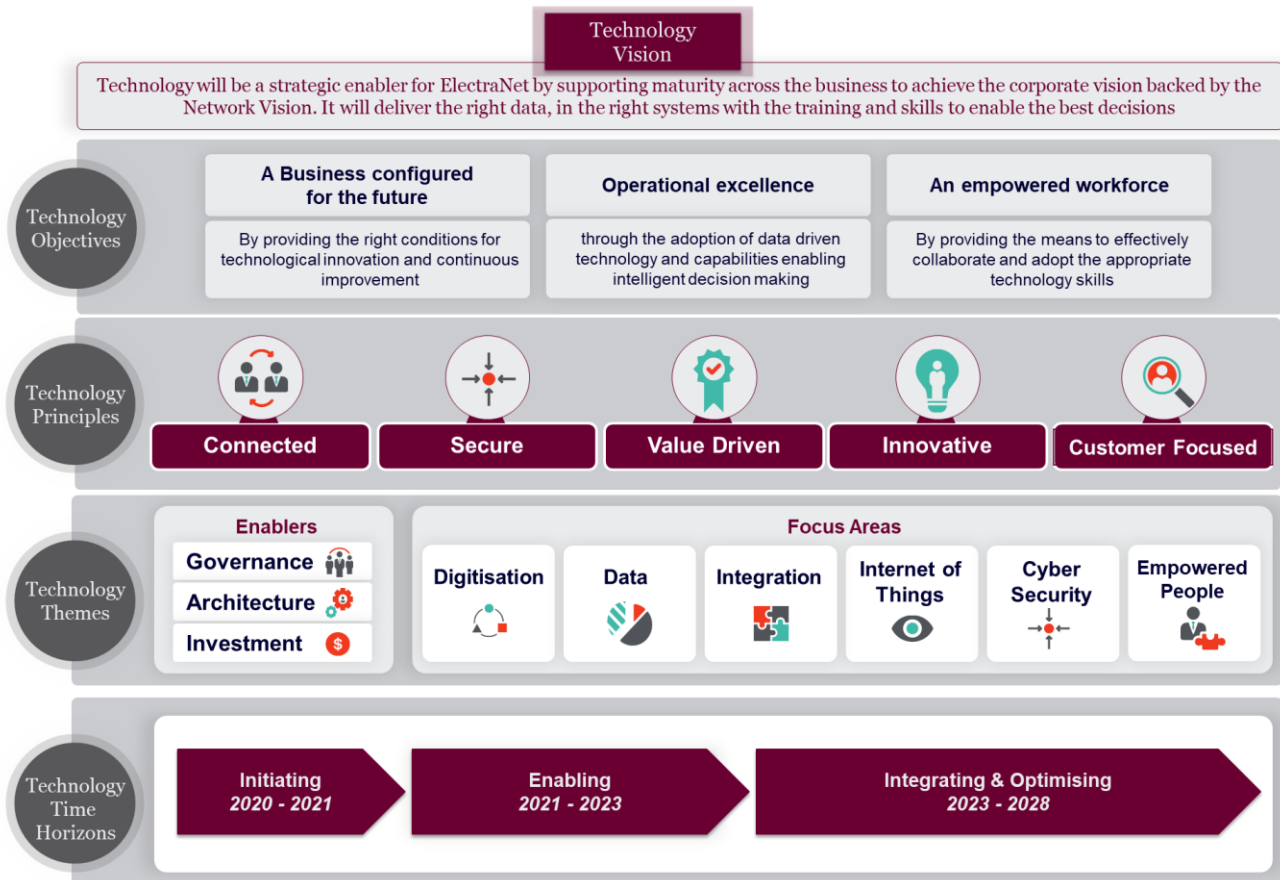
6   Technology Objectives

This strategy is driven by ElectraNet's Network Vision and an agreed future state developed with key stakeholders from across ElectraNet:

- A Business **configured for the future** by providing the right conditions for technological innovation and continuous improvement

- **Operational excellence** through the adoption of data driven technology and capabilities enabling intelligent decision making

- **An empowered workforce** through enabling collaboration and delivering the skills required to effectively harness technology

7   Technology Principles

The Technology Strategy is underpinned by five key principles and are based on the feedback from ElectraNet staff. They provide a common thread through the sections of the strategy and help demonstrate how the strategic themes are based on the views of stakeholders across the business.

Technology will enable ElectraNet to become more:

1. **Connected**

   (a) Technology will enable the business to be more connected whether that is connecting data across systems, connecting assets across the network providing collaboration tools to connect people and teams or developing better ways to connect with external partners.

2. **Secure**

   (a) Technology will ensure that as more diverse and complex assets and operational methods are introduced into the network, the appropriate security is implemented to protect systems, data and processes.

   (b) Technology will ensure that it aligns and complies with the Cyber Security Strategy that is being developed using the AESCSF Framework.

3. **Value driven**

   (a) Technology will be driven by a focus on business priorities. First and foremost, technology exists to support and mature business capability.

   (b) Technology investment will be guided by the value provided to the customer, the business and regulatory requirements.

   (c) Technology investments will prioritise the removal of unnecessary cost and prevent duplication across the business.

4. **Innovative**

   (a) Innovation will drive technology maturity through exploring and embracing emerging technology such as automation and artificial intelligence

   (b) Technological innovation will help solve challenges across the business by both providing the tools to foster successful innovation and by introducing new ways of managing the network and our assets.
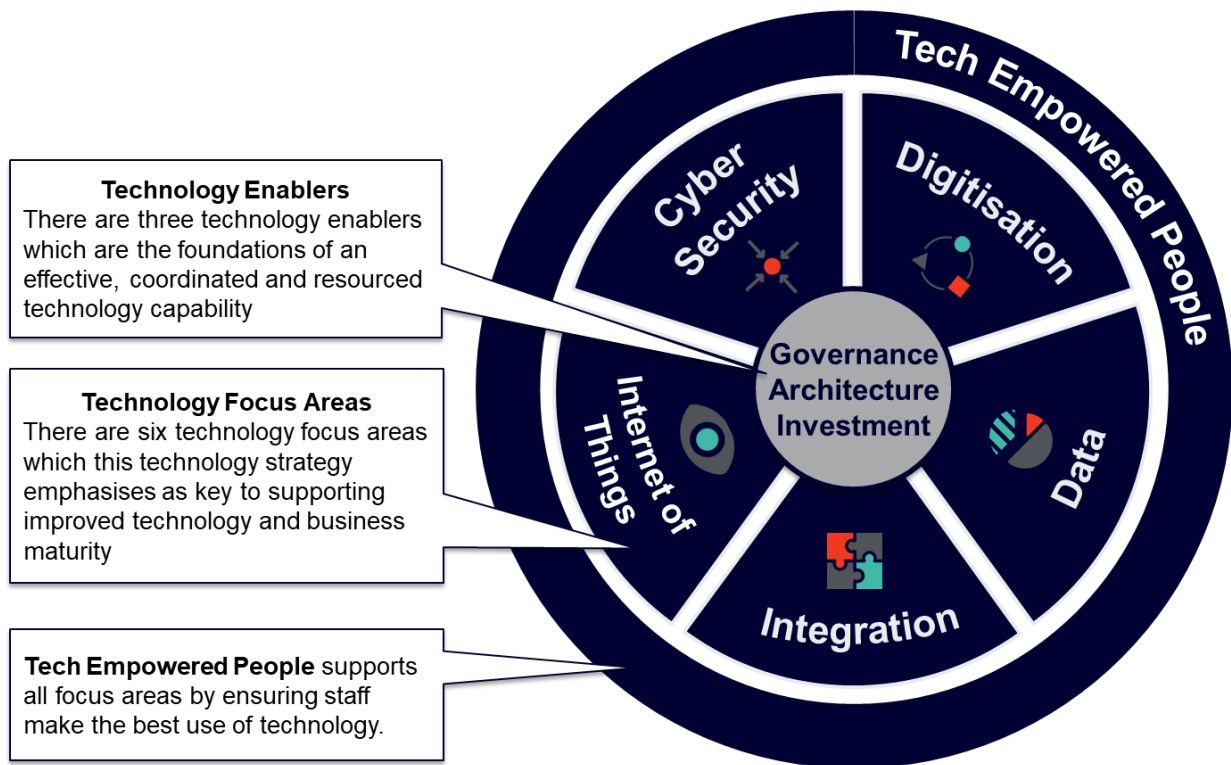
5. **Customer focused**

   (a) Technology will enable the business to be more customer focused by supporting better interactions with direct connect and other customers, enabling them to access their own energy data and positively influence their energy usage.

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8   Technology Strategy Themes

This section describes the key technology enablers and focus areas that were developed following insights from stakeholder sessions.

They form the core of the technology strategy and are the guide in helping to develop the technology initiative roadmap.

Exhibit 8.1: Technology Strategy Themes

Technology Enablers
There are three technology enablers which are the foundations of an effective, coordinated and resourced technology capability

Technology Focus Areas
There are six technology focus areas which this technology strategy emphasises as key to supporting improved technology and business maturity

Tech Empowered People supports all focus areas by ensuring staff make the best use of technology.

8.1 Technology Enablers

8.1.1   Governance

To support a coordinated and business focused technology capability, ElectraNet will:

1. Establish a robust governance framework to guide technology developments

2. Ensure Technology governance mechanisms are focused on enabling technology to deliver business solutions (not technology for technology's sake)

3. Introduce robust and comprehensive governance controls in key technology areas such as data management.

8.1.2   Architecture

To develop an organised and structured technology landscape, ElectraNet will:

1. Build and manage a comprehensive enterprise architecture that includes technical standards and principles that will articulate how technology is organised and structured to support technology governance and decision-making

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8.1.3   Investment

To ensure that the best value technology investment decisions are made, ElectraNet will:

1. Create an investment framework that takes a strategic view of technology investments and places customers, business capability and regulatory requirements at the heart of decision-making.

2. Investment prioritisation will be agreed through technology governance arrangements using these principles.

3. Ensure that technology investment is considered holistically so that the combined value from business cases across the business can be accounted for.

8.2 Technology Focus Areas

8.2.1   Digitisation

To support efficient and effective operations and processes across the business, ElectraNet will:

1. Deliver end to end digitisation of business processes through automation, AI and intelligent business process design

2. Prioritise for the best returns and efficiencies across the business when identifying opportunities for digitisation and enhancement initiatives.

8.2.2   Data

To deliver accurate, reliable, and accessible data across the business, ElectraNet will:

1. Support and align with the Information Management Strategy

2. Establish an agreed single source of truth for specific data types across all platforms and applications

3. Structure data repositories to allow that data to be queried, visualised and interrogated so that the business can derive intelligent insights with confidence

4. Prioritise data skills as a core competency across the business.

8.2.3   Integration

To achieve the integration of processes and data across system solutions ElectraNet will:

1. Prioritise the integration across IT and OT in a way that supports better business processes, data and collaboration.

2. Identify and realise opportunities to implement process automation and artificial intelligence across existing and future platforms.

3. Securely improve connections with external systems and data sources across the value chain, especially with respect to partners who help deliver works management across the network.

8.2.4   Internet of Things

To orchestrate and optimise operations and to drive efficiency, ElectraNet will:

1. Deliver a comprehensive deployment of sensor technology to support smart grid maturity

2. Connect operations to facilitate machine learning capabilities and enable self-healing

3. Scope and implement enabling technologies

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8.2.5   Cyber Security

To ensure secure and comprehensive cyber security controls across the business, ElectraNet will:

1. Develop a comprehensive Cyber Security Strategy using the AESCSF Framework and ensure this is aligned with the objectives and principles of the Technology Strategy

2. Employ security by design principles to ensure that cyber security is an integrated part of enterprise and system architecture.

3. Enable cyber security to provide systematic detection, notification and responses to threats.

8.2.6   Technology Empowered People

To ensure we develop our people and provide the skills and the collaborative culture we need for the future, ElectraNet will:

1. Undertake a technology-based skills analysis across the business, focused on identifying skills gaps across the workforce

2. Ensure that training requirements are incorporated into enterprise architecture and system design activities.

3. Prioritise data competency as a key skill set to support technology maturity.

4. Ensure technology competency is a key consideration for recruitment

9   Technology Time Horizons

ElectraNet categorises the technology strategy in three time horizons that begin in 2020 and end in 2028. Each horizon includes a set of initiatives based on achieving a target level of technology maturity using the SGMM.

Target maturity for each time horizon is determined based on what is needed to support ElectraNet's business priorities and the Network Vision as shown below:

▪   **Horizon 1** will achieve level 1 technology maturity defined **Initiating** in the SGMM

▪   **Horizon 2** will achieve level 2 technology maturity defined as **Enabling** in the SGMM

▪   **Horizon 3** will achieve level 4 technology maturity defined as **Integrating & Optimising** in the SGMM

Exhibit 9.1: Technology Time Horizons
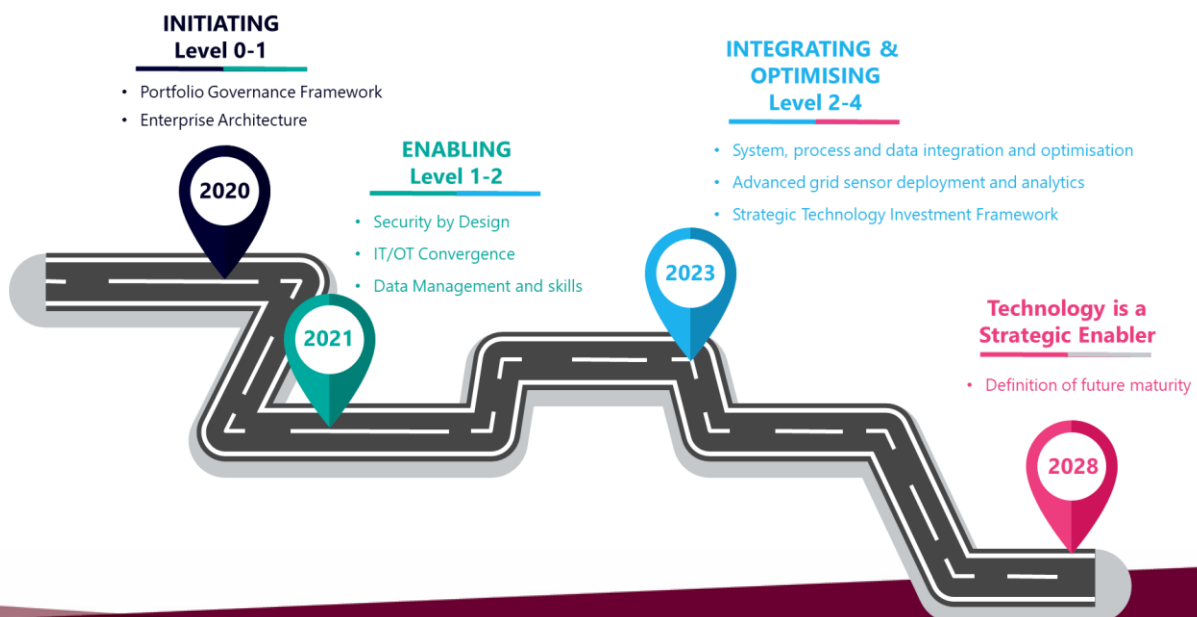
Investments to achieve these outcomes will involve capital and operational expenditure based on robust business cases and assessed by strong governance arrangements. The next step in the planning process will be to deliver an initiative roadmap with high level business cases, based on these three phases.

9.1 Current and Target Levels of Technology Maturity

Technology Time Horizons describe the stages of the strategy and the below table articulates the current and aspirational levels of technology maturity to be achieved across each of the focus areas:

Focus Area	Today (Level 0)	Target Capability by 2023 Initiating & Enabling (Level 2)	Market Opportunity by 2028 Integrating & Optimising (Level 4)
Digitisation	Network planning and orchestration is carried out across multiple systems with many handoffs and workarounds	Business processes are beginning to be automated on a use case-by-use case basis as vendor solutions mature	Core operational processes are largely automated with human intervention and oversight for planning and optimisation of grid operations and asset efficiency
Data	Data is collected (at substantial cost) but not aggregated, analysed or visualised across systems or functional siloes. Information Management Strategy is at early stages of implementation.	Common data platforms, analytics and visualisation (including geospatial) technologies are in place to inform real time decision-making	Data platforms support geospatial analysis and decision automation. Predictive modelling allows for scenario analysis and management of complex events
Integration	Systems landscape constrains interoperability with no common architecture or standards to enable processes across business functions	Integration frameworks and architectures are in place to allow data to be passed between systems without the need for point-to-point interfaces or connectors	Highly interoperable and modular architectures allow integration services to be reused to develop new functional capabilities internally
IoT	Sensor technology has been deployed opportunistically across the network without an overarching strategy to exploit potential cost and operational benefits	Cross-functional sensor strategies are in place and maturing COTS platforms are beginning to form the basis of an integrated approach to smart grid technology	Self-healing and semi-organic continuous improvement and operation of the grid through Artificial Intelligence and Machine Learning capabilities
Cyber	Cyber Security maturity is aligned with industry peers and a programme is in place to address the increasing cyber threat landscape.	Cyber function has standards and policies in place as defined by the Cyber Security Strategy and these are applied in the design and operation of all technology, grid operations and asset management solutions	Security by Design is common practice throughout business and operational systems with ability to systematically detect, notify, and respond to threats
Technology Empowered People	There is no coordinated approach to technology skills development or learning management and there is not a clear view of where skills gaps occur regarding technology	Training is a fundamental consideration for technology implementations. A holistic analysis of competency gaps has identified technology training requirements across the business with particular attention paid to data competency.	Staff across the business are enabled to make the best use of technology to support them and their teams. Data is accessible and well understood which allows for effective decision-making.

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9.2 Initiating 2020 – 2021

To achieve a maturity level of 1 using the SGMM, fundamental governance and architectural enablers will be established including:

Enabler	Initiative	Principles
Governance	1. Establish clear portfolio governance to ensure alignment with Network Vision and allocation of resources in line with corporate goals and objectives	
Architecture	1. Establish strategic architecture to guide technology decisions, avoid duplication, reduce 'shadow IT' and ensure cost efficiency across the technology landscape	

9.3 Enabling 2021 – 2023

To achieve a maturity level of 2 using SGMM, the roadmap will build on the technology enablers to deliver the following initiatives:

Focus Area	Initiative	Principles
Digitisation	1. Establish a common framework for digitisation/automation of operational processes on an opportunistic basis	
	2. Build towards an integrated, digital view of grid operations, assets and workforce in their geospatial context	
Data	1. Align existing data platform(s) towards a more considered architecture and apply common standards and policies to maintain it, in line with the Information Management Strategy	
	2. Establish governance and leverage the Information Management Governance Group to ensure interoperability and prioritise investment towards highest value data assets	
	3. Build skills and capabilities to aggregate, manipulate and visualise available data sources to systematically identify efficiency/optimisation opportunities	
Integration	1. Establish common integration standards, patterns and solutions to reduce dependency on point-to-point integrations between legacy systems	
	2. Tactically/opportunistically optimise legacy systems towards this common integration framework with a set of foundation platforms (such as SAP and EMS) as the backbone	
Internet of Things	1. Establish governance to align IoT proof of concepts and pilots with Network Vision, in alignment with the strategic architecture	
	2. Evaluate suitability of deployed remote sensing network to act as a suitable foundation for automation of control and protection schemes, and condition-based/predictive maintenance	
Cyber	1. Establish suite of security policies and standards as defined in the Cyber Security Strategy that are applied consistently across the business	
	2. Embed Security by Design practices in all new technology initiatives	
	3. Incorporate grid and asset data from remote sensors into security operations without manual oversight	
Technology Empowered People	1. Incorporate technology disciplines into role descriptions & competency frameworks: e.g. process automation, business analytics, geospatial analysis, & cybersecurity	
	2. Incorporate training and development in new technologies and systems into capex budgets for new projects	

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9.4 Integrating and Optimising 2023 – 2028

To achieve a maturity level of 4 using SGMM, the roadmap components become more complex and transformational:

Focus Area	Initiative	Principles
Investment	1. Move towards a 'whole of business' governance model for technology investments that aligns Cybersecurity, GIS & Secondary Protection Systems to reduce risk & increase capital efficiency	🏅
	2. Move towards a more flexible technology funding and sourcing model that enables ElectraNet to shift 'heavy lifting' between Capex and Opex according to external demands	🏅
Digitisation	1. Establish a program of end-to-end visualisation, digitisation (and, where appropriate) automation of operational processes across the business	🏅 🔍
	2. Embed real time geospatial analysis capabilities to enable wide area monitoring and identify process optimisation/cost reduction opportunities (inc. extended value chain and land management)	👥 🔍
Data	1. Develop data platforms to incorporate, analyse and visualise large volumes of real time analytical data gathered from internal and external sources	👥 🏅
	2. Build advanced analytics capabilities to build towards real time intelligence/decision automation and predictive modelling to simulate and respond to complex scenarios	💡
	3. Invest in AI/ML trials to unlock greater efficiency, safety, reliability and security opportunities	🏅 💡
Integration	1. Move towards unified, digitised business process flows across IT/OT and Telco, and converge towards common integration platforms that allow these processes to be modelled, orchestrated and automated end-to-end	👥 🔍
	2. Establish common architectural standards that support interoperability, modular solution components & frictionless traversal of processes and data across the systems landscape	👥
Internet of Things	1. Establish strategic IoT platform(s) and architecture to enable end-to-end monitoring, control & optimisation of grid operations, fixed & mobile assets and workforce in real time	👥 💡
	2. Build towards self-healing and semi-organic continuous improvement and operation of the grid (including distributed energy management solutions) through Artificial Intelligence and Machine Learning capabilities	👥 💡
Cyber	1. Mature Security by Design as a core element of business and operational systems with ability to systematically detect, notify, and respond to threats	⊹
	2. Implement security management and monitoring processes and technologies to protect interactions with an expanded portfolio of value chain partners	⊹
	3. Continually evolve security strategy and tactics based on real time intelligence and wide area situational awareness	⊹
Technology Empowered People	1. Embed a strategic view of required technology competencies across all roles across the business (not just IT, OT or Telco) as part of an overall workforce development plan	🏅
	2. Establish relationships with education and training providers to develop integrated training and development programs for the workforce, including graduates/apprentices	🏅

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APPENDICES

Appendix A   AMCL Asset Management Excellence Model™

AMCL's Asset Management Excellence Model™ (AMEM) has been used within the current regulatory period to assess the maturity of ElectraNet's Asset Management capability and develop the Business Maturity Roadmap, with the objective of meeting the requirements for ISO 55001 compliance.

To ensure alignment and avoid duplication, a short exercise was undertaken to overlay the 39 subjects of the AMEM onto the SGMM and draw on the findings of the AMCL review to benchmark ElectraNet's current Asset Management capability and alignment with the ISO 55001 standard.[5]

The Technology Strategy has been developed to support the delivery ElectraNet's desired level of organisational maturity against both the SGMM and AMEM.

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[5] ElectraNet SGMM-AMEM Analysis Report v1.0

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Appendix B Glossary

ID	Term	Description
1	Technology	Within this Strategy it describes both Information Technology (IT), Telecommunications and Operational Technology (OT) that ElectraNet uses to manage the SA transmission network and supporting operations.
2	Operational Technology (OT)	A category of computing and communication systems to manage, monitor and control industrial operations with a focus on the physical devices and processes they use.
3	Information Technology (IT)	The use of systems (especially computers and telecommunications) for storing, retrieving, and sending information.
4	Smart Grid Maturity Model (SGMM)	A business tool stewarded by the Software Engineering Institute at Carnegie Mellon University. It was originally developed by electric power utilities for use by electric power utilities. The SGMM has been used to help develop this Technology Strategy.
5	SGMM Domain: Strategy, Management & Regulation (SMR)	This domain covers capabilities and characteristics that enable vision and strategy, establish processes, and promote collaborative relationships with stakeholders.
6	SGMM Domain: Organisation and Structure (OS)	This domain covers capabilities and characteristics that focus on communications, culture, structure, training and education, and knowledge management.
7	SGMM Domain: Works & Asset Management (WAM)	This domain covers capabilities and characteristics that support the optimal management of assets and workforce resources.
8	SGMM Domain: Grid Operations (GO)	This domain covers capabilities and characteristics that supports reliable, secure and efficient operation of the electrical grid.
9	SGMM Domain: Customer (Cust)	This domain covers capabilities and characteristics that enable customer participation toward achieving the benefits of smart grid transformation.
10	SGMM Domain: Value Chain Integration (VCI)	This domain covers capabilities and characteristics that underlie an electric utility's ability to achieve its goals by successfully managing organisational interdependencies with both the supply chain to produce electricity and the demand chain for its delivery.
11	SGMM Domain: Societal and Environmental (SE)	This domain covers capabilities and characteristics that contribute to achieving societal goals for the reliability, safety, and security of electric power infrastructure, the quantity, and sources of the energy used, and the impact of infrastructure and energy use on the environment and quality of life.
12	SGMM Domain: Technology (Tech)	This domain covers capabilities and characteristics that enable effective strategic technology planning for smart grid capabilities and the establishment of rigorous processes for the evaluation, acquisition, integration, and testing of new technology.
13	Asset Management Consultancy Ltd (AMCL)	A leading specialist Asset Management consultancy providing independent advice, tools and training to asset dependent businesses across the world.
14	Asset Management Excellence Model (AMEM)	A leading Asset Management assessment methodology
15	Business Maturity Roadmap (2023)	An inflight Roadmap that incorporates 25 ElectraNet initiatives to be undertaken to achieve ElectraNet's corporate goals and objectives up to 2023.
16	The Australian Energy Sector Cyber Security Framework (AESCSF)	A framework developed and tailored to the Australian energy sector. The Framework's purpose is to assess, evaluate, prioritise, and improve their cyber security capability and maturity.

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Appendix C Stakeholder List

Table 1: List of Stakeholders that were consulted regarding the:

1. **The Current State Assessment**
2. **The Future State Determination (including the Future Cast Event)**

ID	Attendee	Role / Title	Division	Current State Analysis	Future State
1	Bill Le Blanc	Head of Technology	Corporate Services	✓	✓
2	Michael Dobbin	Manager Asset Lifecycle	Asset Management	✓	✓
3	Rohan Fernandez	Manager Strategic Asset Management	Asset Management	✓	✓
4	Frank Maio	Asset Information Manager	Asset Management		✓
5	Sam Ballantine	Asset Administrator – Spatial GIS	Asset Management		✓
6	Gary Adkins	Manager Asset Eng & Maintenance Delivery	Network Services	✓	✓
7	Sageran Naicker	Manager Project Engineering	Network Services	✓	✓
8	Kevin Oon	Secondary Systems Engineering Manager	Network Services		✓
9	Doug Deans	Manager Network Operations	Network Services	✓	✓
10	Kong Foo	Power Systems Manager	Network Services	✓	✓
11	Duncan Ramsay	Planned Outage Manager	Network Services	✓	✓
12	Duane Brooks	Transmission System Operator	Network Services	✓	✓
13	Phil Watson	Manager Operational Technology	Corporate Services		✓
14	Brenton Aardenburg	Principal Engineer Digital Technology	Asset Management		✓
15	David Schutz	Telecommunications Manager	Corporate Services		✓
17	Hugo Klingenberg	Manager Network Development	Asset Management	✓	✓
18	John Haddow	Customer Connection Planning Manager	Asset Management	✓	✓
19	Brad Harrison	Power System Planning Manager	Asset Management	✓	✓
20	Jo Watkins	Technology Partner & Service Lead	Corporate Services		✓
21	Steve Sturm	Manager Information Technology	Corporate Services	✓	✓
22	Ren Gentilcore	IT Solution Architect	Corporate Services	✓	✓
23	Yadu Nambisan	Team Lead SAP Solutions	Corporate Services	✓	✓
24	Mark Jones	Solutions Analyst	Corporate Services	✓	✓
25	Steve Calabro	IT Infrastructure Manager	Corporate Services	✓	✓
26	Mick Zoyke	Cyber Security Manager	Corporate Services	✓	✓
27	Mark Cannadine	Manager Business Resilience	Corporate Services	✓	✓

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ID	Attendee	Role / Title	Division	Current State Analysis	Future State
28	Sarah Burton	Manager People Operations	Corporate Services	✓	✓
28	Sophie Holdstock	Manager People Partnering	Corporate Services	✓	✓
29	Steve Porter	Head of Safety & Sustainability	Corporate Services	✓	✓
30	Scott Haynes	Land Services Manager	Corporate Services	✓	✓
31	Brad Parker	Principal Engineer Power Systems	Asset Management		✓
32	Mark Harris	Lead HSE & Sustainability Advisor	Corporate Services	✓	✓
33	Kokila N Admanathan	Design Manager	Network Services		✓
34	David Malovka	Project Controls Manager	Network Services		✓
35	Simon Appleby	Manager Regulation & Investment Planning	Asset Management	✓	✓
36	Bill Jackson	Pricing Manager	Asset Management	✓	✓
37	Paul Wilkinson	Manager Change and Transformation	Corporate Services	✓	✓
38	Mitchell Baker	Business Development Advisor	Corporate Development		✓
39	Shane Bewry	Head of Supplier Relations	Finance	✓	✓
41	Claire Whittington	Legal Counsel	Legal and Governance		✓
42	Nick Gaeta	Senior Portfolio Analyst	Finance	✓	✓
43	Ann Perriam	Enterprise Portfolio Partner	Corporate Services	✓	✓
44	Declan Lammers	Lines Engineer	Network Services		✓
45	Asha Donga	Substation Engineer	Network Services		✓
46	Senthil Arumugam	Lead Automation Engineer	Network Services		✓
47	Danny Chu	Asset Engineering & Standards Manager	Asset Management		✓
48	Jock Baker	Power System Capability Manager	Asset Management		✓
49	Andrew Wilkinson	Asset Performance and Investigations Mgr	Asset Management		✓
50	David Braham	Senior Treasury Analyst	Finance		✓

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