Network 2035 Vision Strategy

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Contents

1. Introduction

South Australia's electricity transmission network is a strategic asset that underpins the State's economic and regional development.

ElectraNet has developed the Network 2035 Vision as a collaborative exercise with stakeholders to set out a framework for the development and operation of South Australia's electricity transmission network over the next twenty-five years. This Strategy provides a summary of the Network 2035 Vision and the resulting strategic priorities for network development and asset management.

The Vision and associated objectives and guiding principles drive integrated decision making on the long-term management and development of the network at all levels. The relationship between our Network 2035 Vision and network planning and operational activities is represented in Figure 1 below.

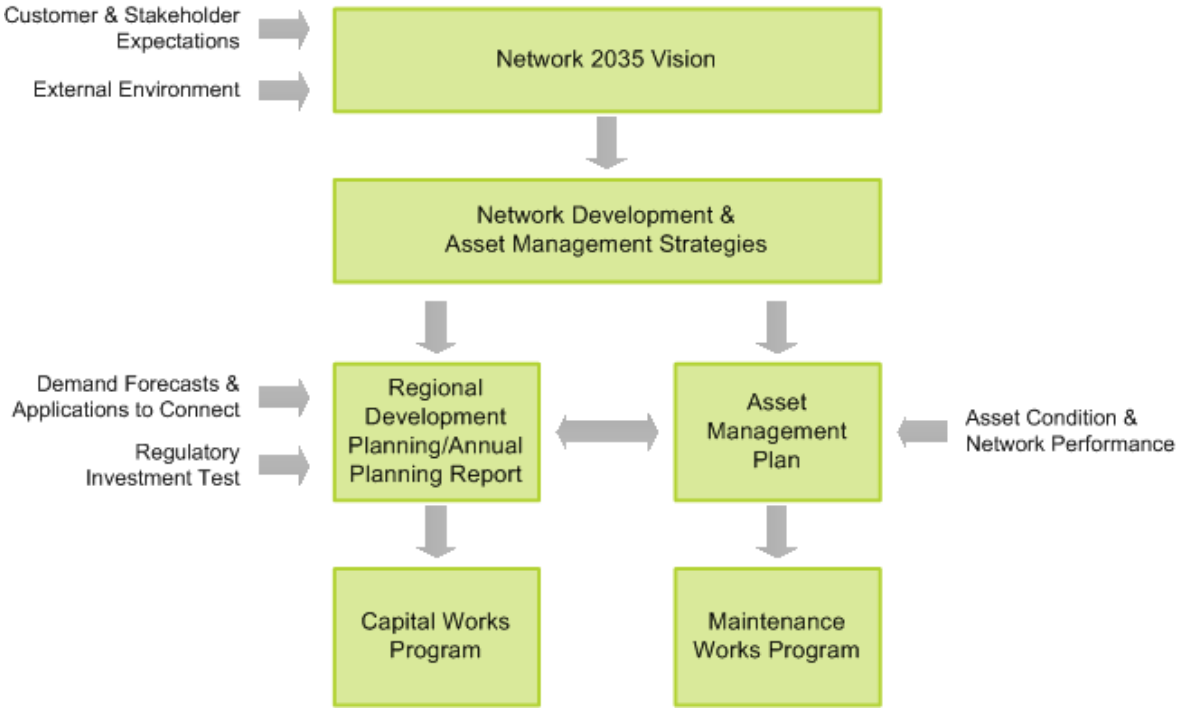

Figure 1: Network 2035 Vision – Strategic Framework

This Strategy briefly outlines the context for the Network 2035 Vision and the framework for implementation of the Vision, guiding principles and the resulting strategic priorities over the next regulatory period. It highlights that the transmission network is a critical asset for the South Australian community. It also highlights that the forthcoming period will not be 'business as usual' for operating and maintaining this asset; it will be characterised by significant uncertainty driven by political, economic, social and technological factors.

Development of the Vision involved initial stakeholder input on future development scenarios, followed by engagement on the proposed Vision itself in the final quarter of 2011 through public release of the document, individual briefings and stakeholder

submissions. Feedback from this process was taken into account in producing the final Vision.

2. Context

2.1 South Australia's electricity transmission network

South Australia's electricity transmission network is a strategic asset that underpins the State's economic and regional development. It comprises approximately 5,600 kilometres of transmission lines connecting 88 high-voltage substations and covers approximately 200,000 square kilometres.

The network provides reliability and security of supply

The network links multiple power generators to multiple load centres and connects the State to the rest of the National Electricity Market. The security this provides can be seen on the hottest days in summer, when transmission assets work at their limits as large amounts of electricity are imported from interstate to meet South Australia's power demand. At other times, the network carries electricity exports interstate.

The network also plays a vital role in the State's water security by supplying power to SA Water pumping stations along the River Murray.

The network facilitates sourcing of least-cost electricity

The electricity transmission network enables competition in the National Electricity Market operated by AEMO. Electricity retailers can buy power from competing generators to constrain the price of electricity even when supply is short.

The network supports economic development and community prosperity

An efficient and reliable electricity transmission network is one of the reasons South Australians can enjoy a high level of prosperity and quality of life. All South Australians rely on the safety, quality and cost-efficiency of our services.

The network supports economic development and employment in remote and regional areas by transporting electricity over long distances across South Australia. Without it, many regional locations would have to resort to more costly on-site local power generation. Many regional industry projects would not proceed without direct access to the transmission network.

The network supports development of lower emission energy sources

South Australia has some of the best low emission energy resources in Australia, mostly in remote locations. Wind power is already a major industry and development of geothermal power is a promising longer-term prospect. The transmission network connects these and other generators to the National Electricity Market.

2.2 The External Environment

Development of the transmission network has previously been managed in an environment that is largely predictable. A recent review of this environment indicates a less predictable, more dynamic environment. In short, the next 25 years will not be 'business as usual'.

Four change drivers in particular are likely to have a strong influence on development of the transmission network over the longer term. These include:

Political and Legislative

- The Australian Government has introduced the Clean Energy Plan which includes a carbon pricing mechanism and investments in renewable energy sources. While this may increase electricity prices and slightly reduce electricity demand, it also may encourage further investments in alternative fuel sources such as wind farms that would require investments in transmission flow paths.
- Moves towards national regulation of the National Electricity Market and the creation of national standards have been central to electricity market development over the past decade and regulatory certainty is required moving forward.

Economic

- Studies suggest a positive economic outlook in the medium to longer term with the real prospect of significant new mining loads connecting to the transmission network. Proposed mines on the Eyre Peninsula will require electricity for their large scale crushing plants, pumps for slurry pipeline operations and the desalination of water. Further development of the State's mining sector has the potential to significantly influence network investment plans.

Social

- Transmission network development is an issue of community concern. There is continuing growth in peak demand as opposed to energy growth and the community expects a reliable and secure electricity network. Moreover, there is increasing community and political sensitivity to rising electricity prices driving an even stronger focus on efficient network development and delivery of least long-run cost solutions.
- The pressure of increased competition for skilled workers and increasing need to manage competency and knowledge in an environment of rapid change creates challenges for workforce management.

Technological

- Technological change in transmission, power generation and patterns of end-use will influence the network directly (i.e. smart grid technology) and indirectly (i.e. new forms of electricity generation and end-use and possible large-scale and local energy storage).
- Small-scale solar PV generation has the potential to slightly reduce summer maximum demand.
- Plug-in electric vehicles may have an impact on demand if there is sufficient uptake. Although there are currently few plug-in electric vehicles in Australia, several major car companies are planning to release all-electric models in the next few years.

- Increasingly ubiquitous IP connectivity has created a rapid increase in availability of data and information underpinned by advances in telecommunication, computing, geospatial, automation, protection and asset management technology.
- Computer networks and computer systems are under increasing attack from terrorist, criminal and ideological groups with operational risks amplified by the increasing amount of Operational Technology that is connected to IP-based computer networks.
- Data and software integration standards and technologies have matured sufficiently to enable reliable and transparent exchange of data between disparate systems in near real time to present an Integrated Information Environment
- More and more work is being done outside of work places and work hours resulting in increasing demand for mobility at all hours, while user expectations with respect to convenience and ease of use are increasing due to sophisticated user interfaces of mobile devices

3. Network Vision

ElectraNet's Vision for the network to 2035 sets out the following four objectives to meet South Australia's needs in an increasingly dynamic and changing environment:

- **Ensure safe, secure, reliable supply** - A safe, secure and reliable network focused on resilience against natural disasters and extreme weather events that assures both community safety and secure electricity supply for South Australia.
- **Deliver transmission services at lowest long-run cost** - Continued delivery of lowest long-run cost network services by intelligent network planning and use of smart grid technology to increase network asset utilisation. ElectraNet will manage input cost pressures and work with others to seek ways to reduce the growing gap between base-load and peak power demand.
- **Support South Australia's economic development** - Economically efficient network investment that supports South Australia's development. ElectraNet will align its plans with industry needs and continue to explore opportunities for more interstate interconnection to increase price competition in the local electricity market.
- **Support development of lower emission energy sources** - A network to support the continued development of South Australia's low emission energy resources by providing the link between remote generation sources and major load centres.

These objectives support ElectraNet's central purpose to deliver reliable and value for money electricity transmission services to support a sustainable and prosperous South Australian community, as depicted below.

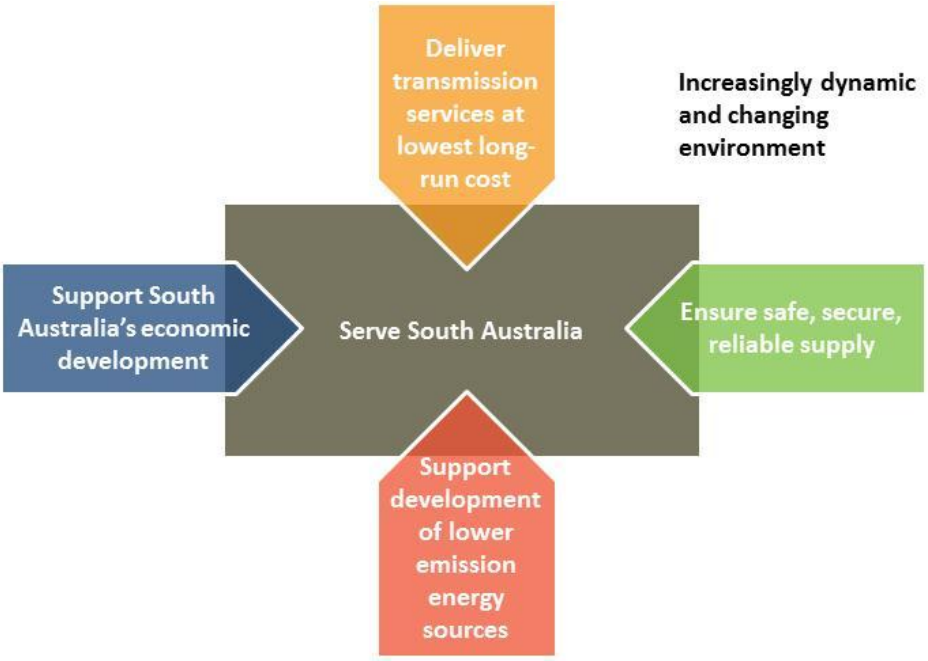

Figure 2: Network 2035 Vision Objectives

4. Guiding Principles

Associated with the network vision is a set of guiding principles which guide network development and asset management strategy and associated plans. The guiding principles are stated as follows:

Table 1: Guiding Principles

Our Customers	
Consultation	Consult with our stakeholders, customers and the community in order to continually improve our long term plans in an increasingly dynamic and challenging environment
Responsiveness	Continue to develop a network that is responsive to customer expectations and to meet future environmental challenges
Delivery	Service delivery will be based on innovative and flexible solutions
Price	Deliver reliable transmission services at the lowest long-run cost to customers
Our Network	
Optimisation	Optimise the capacity, flexibility and performance of the network over a 20 year horizon
Performance	Embed quality and performance monitoring; find opportunities for best practice; share information with customers; and work with regulators to set clear and meaningful performance targets
Investment	Align investment with customer demand for transmission services and mandated reliability and quality of service obligations
Technology	Use new technology (including embedded intelligence) to fully utilise the capacity of the existing network and improve value for money
Security	Build physical and network security over the long term

Our Assets	
Plan	Whole of asset thinking, rather than component level; take a broad view to find the least cost option; maximise synergy between new capacity and renewal of existing plant
Design	Design for high performance and value for money; based on standardised components that maximise plant and easement utilisation and exploit the benefits of modern digital technology and secure digital networks
Construct	Work closely with the local community and use modules assembled off-site to minimise local disturbance and overall cost; where possible avoid the complexity risk of brown-field projects by finding simpler greenfield alternatives; buy wisely, leverage common specifications and maximise competitive pressure on suppliers to get best value
Operate	Preserve safety and build security; use remote monitoring and control via secure digital systems for performance and flexibility; identify spare capacity for contingencies
Maintain	Minimise requirements to work on site or take assets out of service

5. Strategic Priorities

The Network 2035 Vision and guiding principles provide direction and guidance for development of the transmission network and asset management. Figure 3 sets out the strategic priorities for achieving the objectives of the vision now and during the next five-year regulatory period.

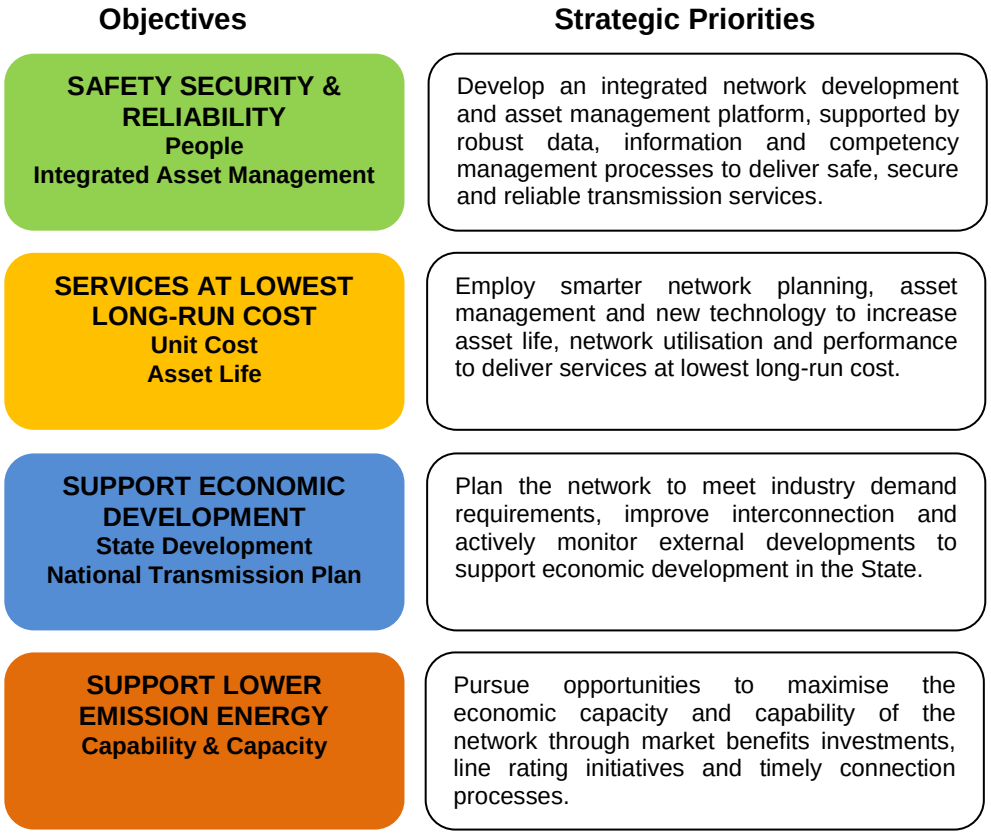

Figure 3: Network Vision Strategic Priorities

The progressive implementation of these strategic priorities over time is illustrated in Figure 4. A more detailed explanation of the strategic priorities is provided in the sections that follow.

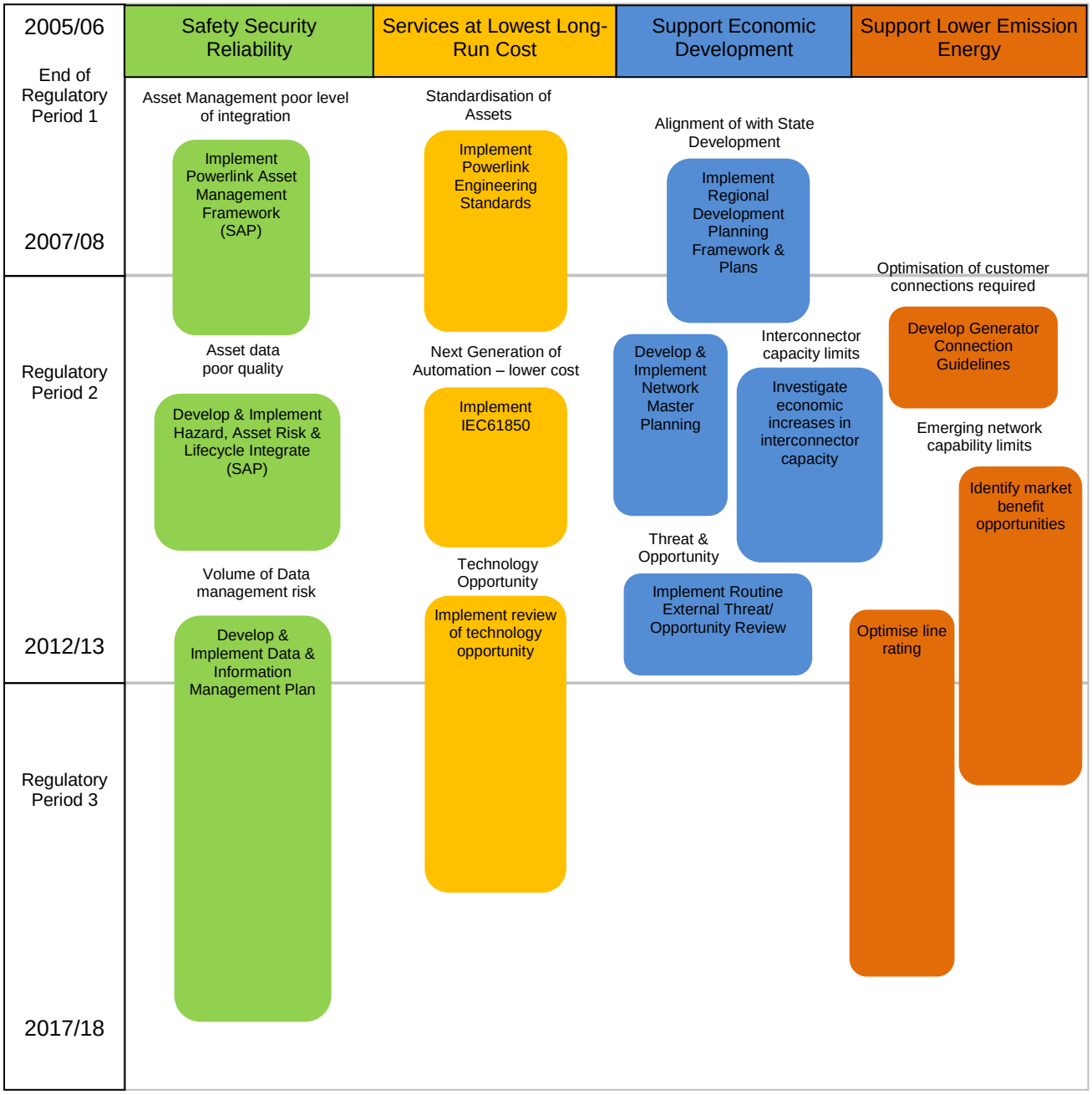

Figure 4: Implementation of Strategic Priorities

5.1 Ensure safe, secure and reliable supply

The safety, security and reliability of supply is dependent on the development of a core network development and asset management framework and supporting systems that are fully integrated to ensure the most efficient decision making processes.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Implement and maintain an integrated asset management framework and supporting system to ensure the ability to manage safety, security and reliability of supply.
- Develop and maintain frameworks for hazard, defect and life cycle management that are fully integrated with the asset management system, to provide high quality asset data to support timely decision making regarding safety, security and reliability.
- Implement a data and information management plan to manage the volume and complexity of data, information and competency requirements to deliver safe, secure and reliable transmission services.

5.2 Deliver transmission services at lowest long-run cost

Delivering transmission services to customers at lowest long-run cost requires a focus on smarter network planning, asset management and use of technology to efficiently promote longer asset lives and improved network utilisation.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Implement recognised engineering design standards to standardise substation and line design to support an optimum network lifecycle.
- Implement the IEC 61850 design standard for substation automation to provide a platform for more flexible control automation to provide opportunities for cost optimisation through improved network performance.
- Undertake regular review of emerging technology threats and opportunities to capitalise on new innovations and improvements available to reduce life cycle cost.

5.3 Support economic development

Supporting economic development is aimed at doing those things that maximise the likelihood of the best long run economic outcomes being realised. The key to the strategy is to create strong linkages with state and national planning frameworks.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Develop and implement regional development plans to align with longer term development plans for the network.
- Implement network master plans to provide high level blueprints for the development of the network on a region by region basis.

- Undertake interconnector studies to explore and pursue opportunities for increased inter-regional transfer capacity to maximise opportunities for market access and benefits for consumers.
- Develop and implement an annual review of the external environment to identify key threats and opportunities to incorporate into business planning processes.

5.4 Support development of lower emission energy sources

The delivery of the lower emission energy objective recognises the need to remove as many entry barriers to low emission energy connections as possible and maximise network capability while maintaining security and reliability of supply to other transmission customers.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Develop and maintain streamlined connection processes and connection configuration guidelines to lower potential entry barriers and facilitate timely customer connection to the network.
- Undertake market benefit studies to systematically identify and assess opportunities to improve network transfer capability and alleviate congestion.
- Improve the rating methodology for transmission lines to release capacity and maximise the utilisation of the network.

These response strategies are technology neutral and will equally benefit generation connections of all kinds.