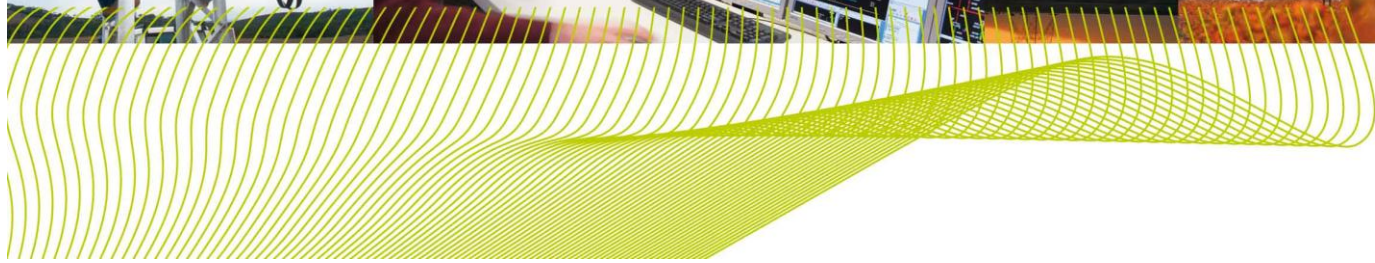




# Network Development Strategy

May 2012



## **ElectraNet Corporate Headquarters**

52-55 East Terrace, Adelaide, South Australia 5000 • PO Box, 7096, Hutt Street Post Office, Adelaide, South Australia 5000  
Tel: (08) 8404 7966 • Fax: (08) 8404 7104 • Toll Free: 1800 243 853

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## **1. Introduction**

South Australia's electricity transmission network is a strategic asset that underpins the State's economic and regional development. The network, which is illustrated in Figure 1, comprises approximately 5,600 kilometres of transmission lines connecting 88 high-voltage substations and covers a service area of approximately 200,000 square kilometres.

ElectraNet's Network 2035 Vision sets out a future vision of safe, secure and reliable transmission services delivered to customers at lowest long-run cost in a way that supports South Australia's economic development and contributes to reducing carbon emissions.

The Network Development Strategy focuses on meeting customer demand for transmission services and delivering net market benefits in the most cost effective manner, while meeting prescribed reliability and quality of supply standards. This includes consideration of non-network solution options, and the use of contingent projects to manage uncertainty.

The South Australian Electricity Transmission Code (ETC) prescribes reliability standards at a connection point level. Network development must also take account of other reliability and technical planning standards included in the ETC and the National Electricity Rules (Rules).

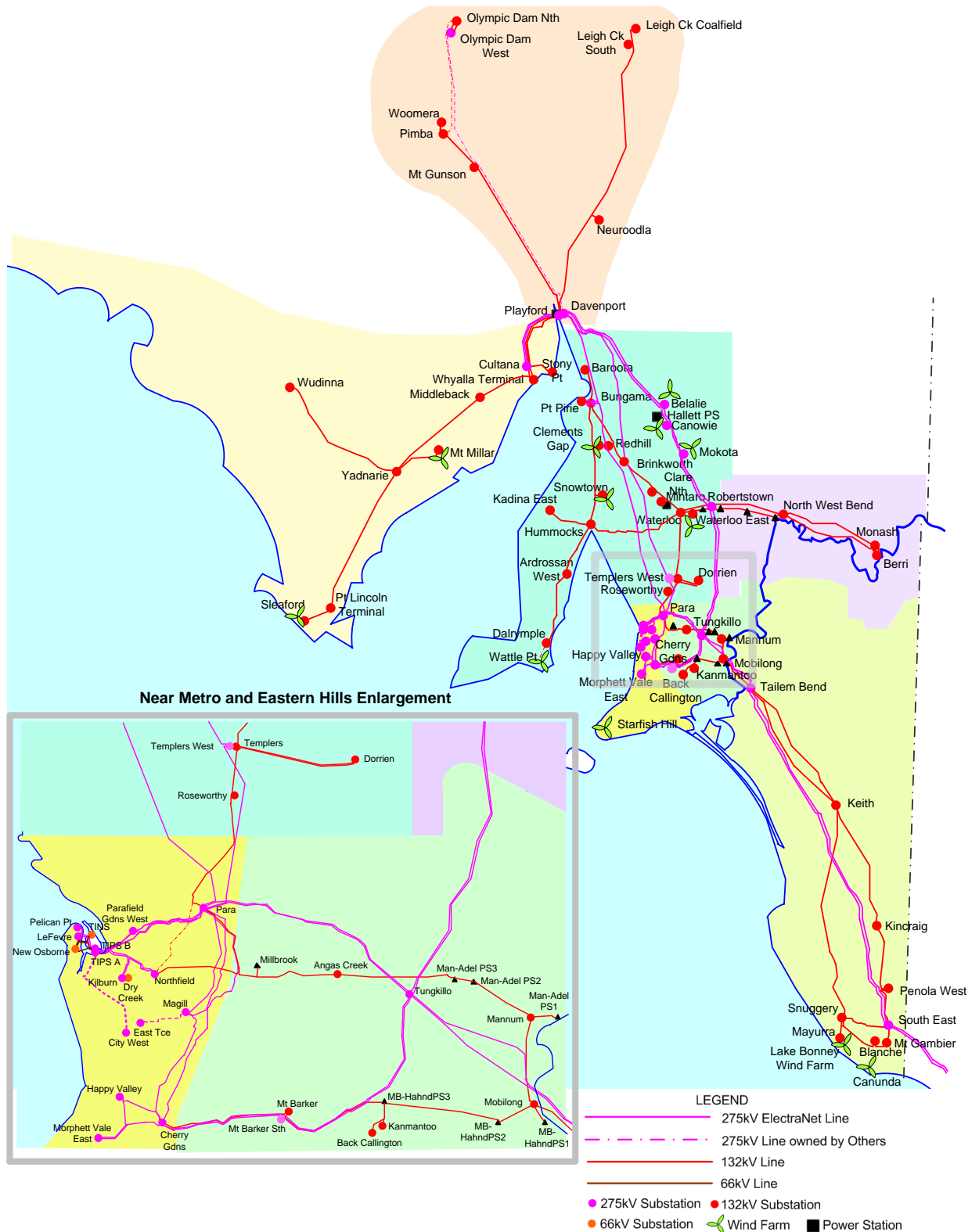
Execution of this Network Development Strategy and associated capital expenditure program will enable the South Australian transmission network to deliver the following benefits for customers:

- Provide ongoing reliability and security of electricity supply;
- Deliver transmission services at lowest long-run cost;
- Support economic development and community prosperity; and
- Support development of lower emission sources of energy.

The scope of this strategy addresses the drivers for capital expenditure in the following categories:

- Connection and augmentation;
- Land/ easements; and
- Security/ compliance.

It also covers the use of contingent projects to manage uncertainty to the benefit of customers and ElectraNet (e.g. uncertainty in the scope and timing of potential new large loads).



**Figure 1: South Australian Transmission Network**

This scope of the strategy does not include any operating, maintenance and refurbishment expenditure or capital expenditure related to:

- Replacement;
- Business IT;
- Inventory/spares; and
- Buildings/ facilities.

The Asset Management Strategy and Information Technology Strategy address the drivers for expenditure in these areas (with the exception of inventory/ spares and buildings/ facilities).

## **2. Strategic Context**

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.

Growing stakeholder interest in getting more out of the existing transmission network is also driving a stronger ongoing focus on maximising network transfer capability, and minimising the extent of emerging network limitations or constraints.

The network is also operating in an increasingly dynamic and changing environment, and faces a range of future challenges. The next 20 years over which the planning horizon extends will not be 'business as usual' given the range of change drivers impacting on the future development and use of the transmission network to meet the increasing needs of the community and industry.

Future network development needs include investments in new transmission lines, which face significant challenges in obtaining planning approvals, increasing the project lead times.

The remainder of this section briefly describes the context for the Network Development Strategy, including planning arrangements in South Australia, regulatory requirements, and demand forecasts as well as other key drivers.

### **2.1 Network planning arrangements in South Australia**

Key features of the transmission planning arrangements currently applied in South Australia include:

- ElectraNet is responsible for investment decision making and service delivery and as a "for profit" entity responds to financial incentives to deliver efficient outcomes;
- Reliability standards are set independently of ElectraNet on an economic basis and expressed deterministically (thereby promoting both efficiency and transparency);
- Demand forecasts used for transmission planning are independently overseen by the Australian Energy Market Operator (AEMO); and

- AEMO provides independent planning oversight via the National Transmission Network Development Plan (NTNDP) and its involvement in joint planning, revenue reset and RIT-T processes.

AEMO provides advisory functions to the South Australian jurisdiction under the National Electricity Law.

In relation to the 2013-2018 regulatory period, the South Australian Government has specifically requested AEMO to assess:

- The validity of the individual augmentation capital expenditure projects proposed by ElectraNet;
- The need and triggers for contingent projects, and
- Whether the South Australian transmission network will meet the requirements set out in the ETC at the end of the regulatory period<sup>1</sup>.

This assessment includes consideration of shared network augmentations, connection asset augmentations and asset management (including replacement) capital expenditure, to the extent that the proposed work program may impact on longer term network developments.

ElectraNet has worked closely with AEMO during the course of the above assessment.

For each augmentation identified, AEMO has assessed that the need exists, that the timing is appropriate under the conditions assumed, and that the option being proposed appears reasonable. AEMO has also confirmed the consistency of the forecast with the NTNDP. AEMO's assessment also generally supports the identified needs and triggers for contingent projects.

## 2.2 Joint planning

ElectraNet works closely with South Australia's Distribution Network Service Provider (DNSP), ETSA Utilities, through a joint planning process to plan and implement new connection points or connection point upgrades between the transmission and distribution networks in a coordinated manner to maximise the cost effectiveness of our investments.

ElectraNet also works closely with AEMO and other TNSPs through a joint planning process to plan works required on major flow paths of the transmission network, including interconnectors.

## 2.3 Reliability standards and regulatory requirements

Under its licence conditions, as well as National Electricity Rules (NER) requirements, ElectraNet must meet statutory obligations such as:

- Maintain connection point reliability standards;
- Maintain regulated voltage levels and reactive margins;
- Manage fault levels;

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<sup>1</sup> The AEMO engagement letter can be found in Appendix A

- Manage equipment ratings;
- Manage system stability and security; and
- Manage Quality of Supply (frequency, harmonics and flicker).

Reliability standards in South Australia are determined by the Essential Services Commission of South Australia (ESCOSA) and published in the ETC.

ESCOSA completed a public review of the ETC reliability standards in March 2012. As part of this review, AEMO was engaged to undertake an economic assessment and, on the basis of this assessment, recommend any changes to reliability standards. The resulting ETC includes minor changes in reliability standards from 1 July 2013, which include:

- Re-categorising Dalrymple and Baroota connection points to Category 2;
- Increasing the fault restoration requirements; and
- Bringing forward required project delivery timeframes to within 12 months of the trigger date.

The new ETC specifies that required project timing is based on the agreed forecast maximum demand (contracted demand) for connection points (currently simply the agreed maximum demand or contracted demand).

The impact of this change is to reduce timing flexibility, and to bring forward the requirement for capital investments to meet the ETC reliability standards.

ElectraNet is also required by the ETC to:

- Plan, develop and operate the transmission network so as to avoid shedding load under reasonably foreseeable operating conditions; and
- Complete all necessary design work, planning approvals and acquire all necessary land and easements to ensure that it is in a position to meet its reliability obligations on the basis of projected demand.

A summary of the ETC reliability standards can be found in Appendix B.

## **2.4 Telecommunications requirements**

There are a number of drivers for developing increased capacity in the telecommunications network, including:

- An increase in the number of intelligent devices being deployed within substations. This results in more data to be measured, gathered and transmitted, and more devices that can be remotely controlled and managed. It also enables the remote configuration of those devices rather than configuration by visiting the site;
- Remote visual monitoring of substations via video surveillance;
- Increased demand as more monitoring equipment moves from analogue to digital technology; and
- An increase in the quantity and frequency of data required by AEMO to manage the National Electricity Market (NEM).



## 2.5 Demand forecasts

ElectraNet uses the AEMO state-wide diversified demand forecast to plan main grid augmentations as well as main grid reactive requirements.

AEMO publishes these forecasts in its South Australian Supply and Demand Outlook (SASDO) at the same time ElectraNet publishes the Annual Planning Report (APR). Table 1 sets out the AEMO 2011 medium growth 10% probability of exceedance forecasts which have been used to develop main grid augmentation plans including reactive requirements.

**Table 1: AEMO state-wide medium growth 10% probability of exceedance forecasts**

2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
3,570	3,630	3,700	3,780	3,840	3,920	3,960	4,030	4,090	4,170

Annual growth in the diversified connection point maximum demand is forecast at around 2.7% across the period, compared with a projected annual increase in energy consumption of around 1.6%, based on AEMO forecasts.

The AEMO state-wide forecasts are diversified, which means that they are top down forecasts that reflect the fact that peak demand does not occur at each connection point on the transmission network at the time of system peak demand. These forecasts are appropriate to be used for main grid planning based on the 10% probability of exceedance forecast being the accepted standard for main grid transmission planning.

However, peak demand forecasts at individual connection points are used for connection point planning (by necessity) and local regional planning based on the observation that there is minimal diversity at a regional level during peak demand times; i.e. in most cases heat wave conditions affect the whole region in question. This is in line with the ETC requirement that requires project timing to be based on the customer forecast maximum demand.

Peak demand forecasts at a connection point level are provided each year by ETSA Utilities (the distribution network service provider) and direct connect customers. These are aggregated to create undiversified demand forecasts for the various transmission planning regions within South Australia. Appendix C sets out the 2011 connection point peak demand forecasts that have been used for connection point and local regional planning.

It is important to recognise that there is an expectation that the summation of the peak demand forecasts used for connection point and regional development planning will be above the state-wide diversified 10% probability of exceedance forecasts.

ETSA Utilities submitted its 2012 demand forecasts to ElectraNet in April 2012. AEMO also has a National Electricity Forecasting Project underway which aims to develop independent electricity forecasts for the National Electricity Market (NEM) as a whole, and for each of the five NEM regions. This initiative is expected to result in the publication of a forecasting report, including revised SA load forecasts, by the end of June 2012.

ElectraNet's identification of network limitations and proposed capital expenditure projects to address these limitations has been reviewed, to the extent possible, prior to submission of its revenue proposal to the AER in the light of the 2012 demand forecasts.

The AER's revenue determination process also provides the opportunity for ElectraNet to submit a revised revenue proposal in early 2013.



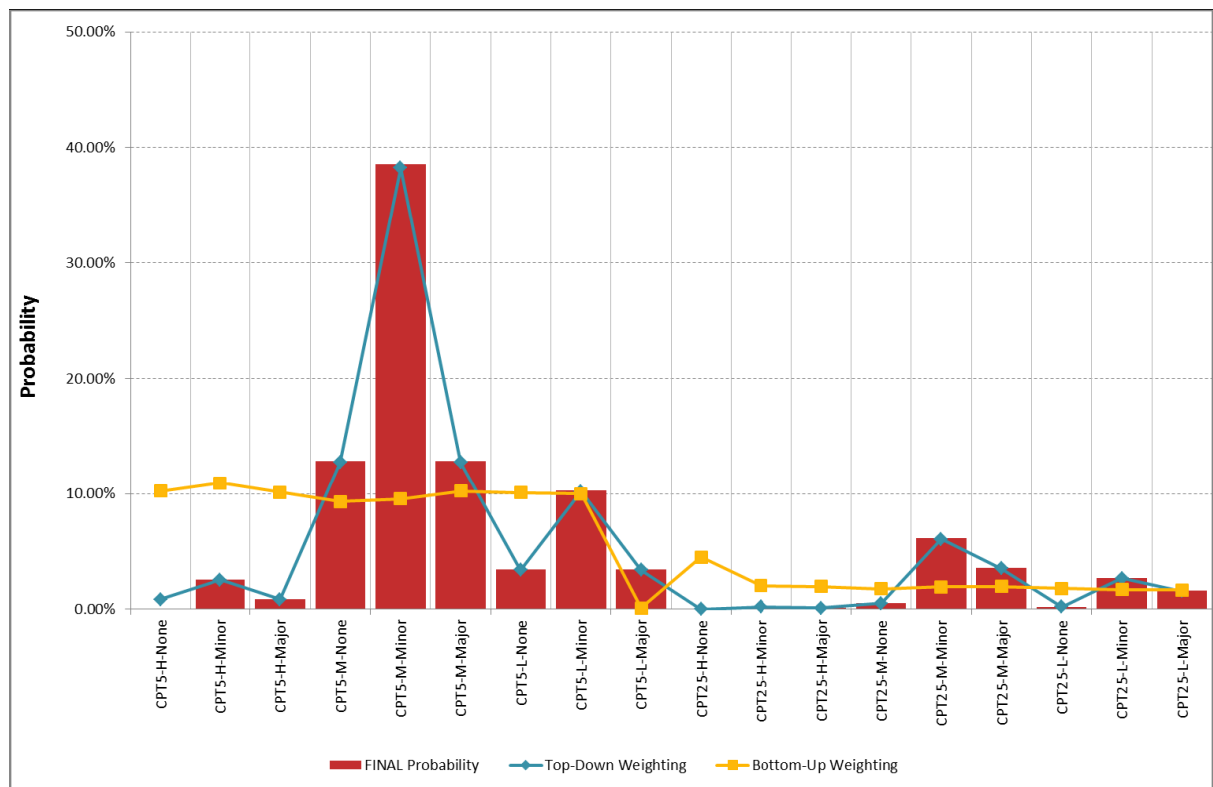
## 2.6 Future network development scenarios

ElectraNet engaged ROAM Consulting to conduct an assessment of potential generation and load developments for South Australia through the application of a probabilistic scenario analysis methodology.

The key inputs to this analysis built on the scenarios developed by AEMO in its NTNDP analysis and comprised:

- Carbon price assumptions (5% and 25%);
- Peak demand assumptions (high, medium and low); and
- Interconnector expansion assumptions (none, minor and major).

These variables were assigned various probabilities which in combination provided a range of 18 plausible market development scenarios. These were combined with a bottom-up generation planting assessment to provide a final set of weighted scenarios representing different patterns of generation and load development across the South Australian transmission network, as shown in Figure 2 below.



**Figure 2: Final Scenario Probabilities (Roam Consulting)**

These scenarios have been applied as a sensitivity to test the robustness of the demand driven network project forecast.

A notable feature of the transmission network capital expenditure forecast for 2013-14 to 2017-18 is that the augmentation and distribution connection point projects identified are largely independent of the generation development and demand forecast assumptions considered in the various scenarios modelled.

The large majority of network projects included in the capital expenditure forecast are required to be completed within the forthcoming regulatory period irrespective of whether demand growth follows the high, medium or low demand forecast and irrespective of where new generation sources locate to meet the growth in demand. This demonstrates the robustness of the forecasts to a range of reasonable scenarios.

## 2.7 Economic and political drivers

Despite various government initiatives, which primarily impact energy consumption rather than peak demand (solar PV, demand management and energy efficiency initiatives), there is a continuing need for transmission investment driven by forecast economic growth and policy changes.

### Economic outlook

The 2011 Resources and Energy Infrastructure Demand Study published in November 2011 by the Resources and Energy Sector Infrastructure Council (RESIC) highlighted a positive economic outlook in the medium to longer term with the real prospect of significant new mining loads connecting to the transmission network. It found that the 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. The survey data estimates that about 450 MW of additional total peak load electricity will be required by 2017 in this region. The provision of electricity will assist the establishment of mines and supporting mining infrastructure to enable the delivery of estimated iron-ore export tonnages of around 50 mtpa by 2017, and estimated capital investment of between \$4 billion and \$6 billion over the next 10 years. The internationally recognised Fraser Institute continues to rank South Australia highly for its mineral resource development potential.

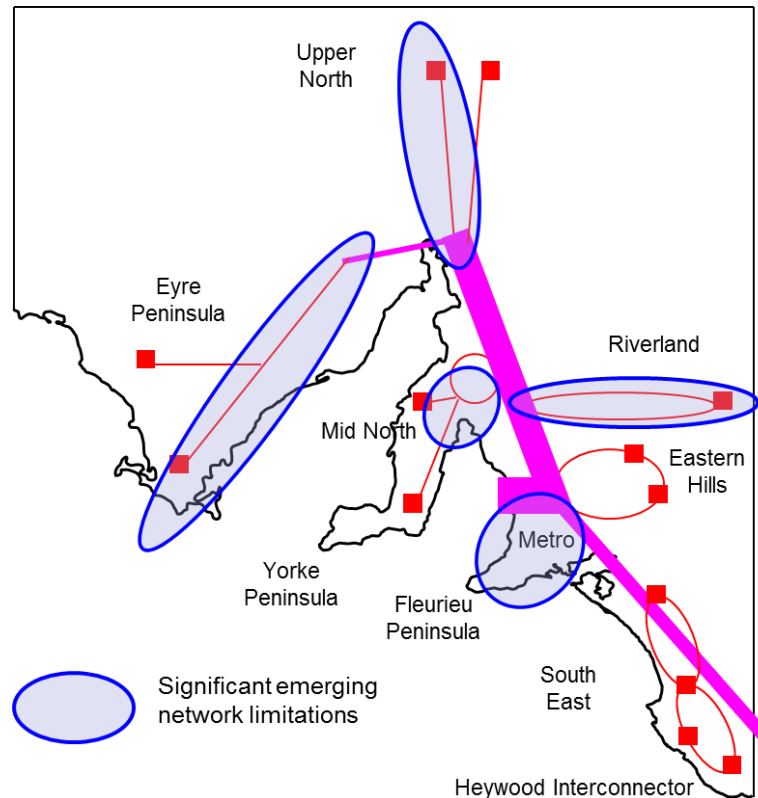
### Clean Energy Future

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 may also encourage further investments in alternative fuel sources such as wind farms that would require investments in transmission flow paths where economic.

## 2.8 Emerging network limitations

Major transmission network augmentations tend to be “lumpy” in nature, i.e. a significant investment may be required to address a certain limitation or constraint, but this investment then reinforces the network for many years to come. Where it is feasible and economic to do so, these major investments are deferred for as long as possible by operational measures, non-network solutions (e.g. Port Lincoln generation network support contract) or smaller network investments (e.g. capacitor banks). There are several locations in South Australia where the transmission network is approaching its installed capability. Most of these are at the extremities of the transmission network, and hence solutions are relatively more costly. Some of these locations also have potential resource developments that would result in step increases in electricity demand.

Figure 3 illustrates the most significant emerging limitations.



**Figure 3: Significant emerging network limitations**

### 3. Strategic Implications

Transmission network development is an issue of community concern. To meet customer expectations, the development of the transmission network requires a balance between the provision of the reliability and security of supply, and minimisation of the cost of installing and maintaining infrastructure, through the application of a risk-based approach. The continuing growth in peak demand as opposed to energy growth is decreasing network utilisation and therefore placing upward pressure on unit costs, while there is also increasing community and political sensitivity to rising electricity prices driving an even stronger focus on efficient network utilisation, development and delivery of lowest long-run cost solutions.

In that context, the government of South Australia has a keen interest in ElectraNet's network development, and has engaged AEMO to review and assess key aspects of ElectraNet's revenue proposal, as discussed above.

ElectraNet's Network Development Strategy focuses on:

- A robust approach to minimise capital expenditure while meeting prescribed reliability standards;
- Deferral of significant capital expenditure for as long as feasible, whilst still meeting prescribed reliability and quality of supply standards; and

- Flexibility to respond in a timely manner to major economic developments; e.g. Eyre Peninsula mining loads.

## **4. Strategic Priorities**

The Network Development Strategy focuses on meeting customer demand for transmission services and delivering net market benefits in the most cost effective manner, while meeting prescribed reliability and quality of supply standards. This includes consideration of non-network solution options and the use of contingent projects to manage uncertainty (e.g. in relation to the cost and timing of augmentations to serve potential new large loads).

Key aspects of the Network Development Strategy include:

- Apply future network development scenarios (including load and generation) consistent with the NTNDP to model and assess network capability to meet forecast demand increases;
- Identify emerging electricity and telecommunications network limitations and develop lowest long-run cost solution options including non-network options;
- Defer capital investments for as long as possible by adopting, where feasible and economic, operational, non-network (e.g. demand side response or generation network support) or lower cost network solution options;
- Maximise efficiency by aligning replacement capital expenditure with connection and augmentation requirements, wherever possible;
- Acquire strategic land and easements in advance of when they are required (consistent with ETC requirements) in order to enable timely delivery of future new lines and substations; and
- Ensure adherence to regulatory obligations with regard to security and compliance are (e.g. control schemes and substation upgrades to reduce outage impacts).

Where network development requires large capital expenditures and there is material uncertainty in the required timing, scope/ cost and/ or market benefits of the development, then this uncertainty is managed by treating the project as a contingent project for regulatory purposes.

The use of contingent projects reduces risk for both ElectraNet and South Australian customers by not committing major investment funds until the need for this investment has reached a sufficient level of certainty. At the same time, this approach enables timely development once that level of certainty has been reached.

## **5. Delivering on the Strategic Priorities**

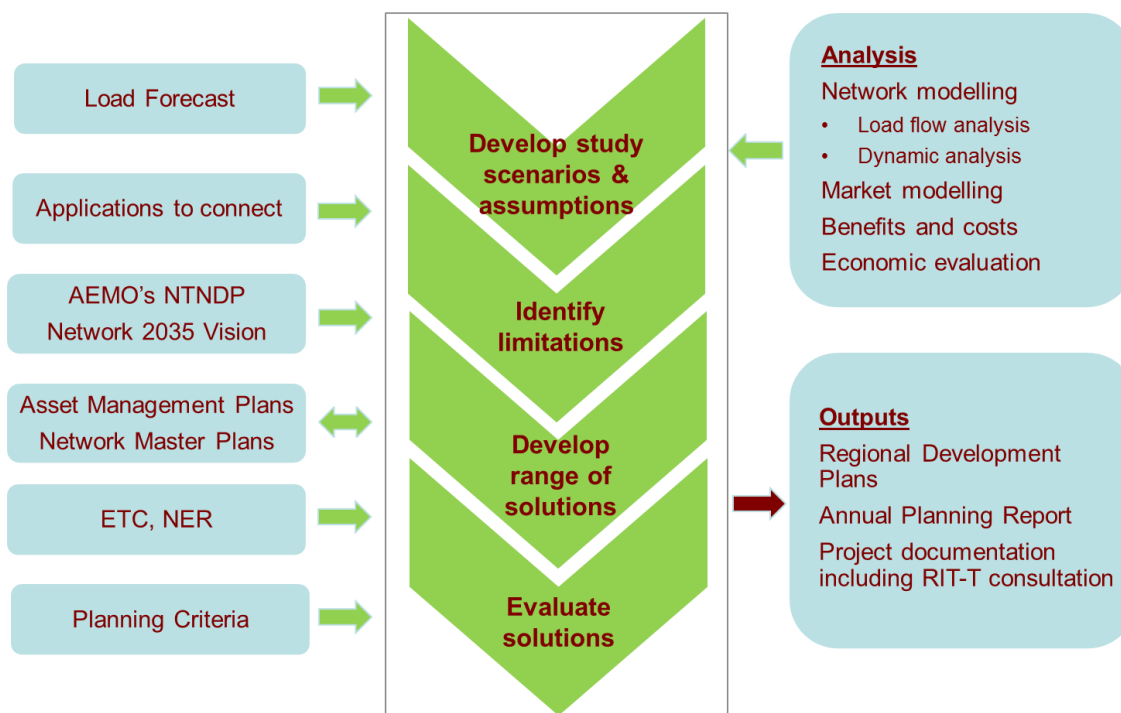
ElectraNet follows an established planning process to develop plans and initiate projects for a reliable, secure and sustainable transmission network to meet customer demand and increase net market benefit. The network development process operates within a strategic framework informed by industry planning documents prepared by AEMO (e.g. the NTNDP<sup>2</sup>)

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<sup>2</sup> See [www.aemo.com.au/planning/NTNDP2011\\_CD/ntndp.html](http://www.aemo.com.au/planning/NTNDP2011_CD/ntndp.html)

and ElectraNet’s Network 2035 Vision<sup>3</sup>, reflecting a risk-based approach to network development decision making.

Figure 4 provides an illustration of the ElectraNet planning process. As outlined in the diagram, key inputs to the network development process include demand forecasts and planning criteria including those derived from ETC and NER requirements. The network development planning process closely interacts with the development of the Asset Management Plan (AMP) and Network Master Plans (NMP). Where assets are identified in the AMP nearing end of life, the Regional Development Plan (RDP) focuses on timing asset replacements so they align with network augmentations.



**Figure 4: Network Development process**

The development of study scenarios and assumptions take account of NTNDP scenarios, demand forecasts, planning standards and criteria and other relevant inputs.

Network limitations are then identified by various means including:

- Future modelling of the power system (typically using PSS/E) based on an established network model (as provided to AEMO) and relevant plant data;
- Evaluating NER/ ETC requirements; and
- Reviewing electricity market constraints (drawing on NTNDP assumptions and PLEXOS modelling).

A hierarchy of solutions is considered to address identified network limitations and, where feasible and economic, to defer the need for major capital investments for as long as possible.

<sup>3</sup> Refer to the Network 2035 Vision Strategy.

### **Operational solutions**

Where operational solutions are feasible they are often the lowest cost option e.g. in the Western Suburbs, a solution was found whereby the splitting of the TIPS 66 kV bus under high load conditions prevents network constraints, thereby deferring the need to reinforce the TIPS – New Osborne 66 kV network.

Switching of distribution loads may also defer or even avoid larger scale transmission investments in relation to connection point reinforcement.

### **Smaller network investments or non-network solutions**

In some cases, smaller investments can effectively be used to defer major augmentations. A good example is capacitor banks providing reactive support to the network, thereby increasing the utilisation of the network closer to its thermal limits. Smaller investments in the distribution network may also defer larger scale transmission investments in relation to connection point reinforcement.

Non-network solutions to defer the need for network augmentation are considered by investigating the following options:

- Support from existing generators;
- Contract for the installation of new small localised generation (5-10 MW); and
- Demand side response from demand aggregators or larger demand ETSA Utilities customers.

Non-network solutions tend to become competitive in circumstances where the load at risk is relatively small and growing slowly, or where the network augmentation is relatively high cost (e.g. if long distances of new transmission line would be required).

### **Significant network augmentation solutions:**

When feasible cost-effective operational, smaller network investments or non-network solutions have been exhausted, more significant network augmentation is required, e.g. new transformers, substations or transmission lines. These projects are usually more complex and require longer lead times, especially when new transmission lines are involved, mainly due to the more stringent land use planning approvals required.

Network solutions are based on a comprehensive set of design and construction standards developed to comply with legislated safety and technical obligations. These solutions are based on scopes of work which identify all known requirements to deliver each project, and project cost estimates based on a detailed database of updated transmission construction costs.

## **6. Capital Investment Overview**

The result of adopting the Network Development Strategy is a requirement for capital investment in the next regulatory period of the order shown in Table 2 and Table 3. Table 2 includes capital expenditure with proposed ex-ante regulatory treatment while Table 3 sets out the most significant contingent projects reasonably likely to proceed in the next regulatory period.

**Table 2: Network Development capital expenditure overview (with proposed ex-ante regulatory treatment)**

Investment Category	Description	Comments	2013-18 Indicative (\$12-13m)
Augmentation	As defined in the Rules, works to enlarge or increase the capability of the network to transmit active energy. Projects generally involve the construction of new transmission lines or substations, and reinforcement of the existing shared network and may be either a reliability augmentation or a market benefits augmentation.	Decrease from current period reflecting uncertainty in major connection activity and focus on smaller investments such as capacitor banks to defer major augmentations and significant line projects	120
Connection	Works to either establish new customer connections or to increase the capacity of existing customer connections based on a specific customer requirement. Under recent changes to the Rules only connection works between regulated networks are treated as prescribed services.	No significant variation from current period based on ongoing demand growth and ETC driven upgrades  Significant projects include the Munno Para, Dalrymple and Baroota connection points	135
Land/ easements	Strategic land and easement acquisitions for future augmentation, connection and replacement requirements.	Increase of over 100% from current period driven by projected need for future major new transmission line projects	65
Security/ compliance	Projects required to ensure the physical security of critical infrastructure assets.	No significant variation from current period. Key drivers include: <ul style="list-style-type: none"> <li>• upgrades to key nodal substations</li> <li>• regional control schemes</li> <li>• radial supply reliability improvement</li> </ul>	60
<b>Total</b>			<b>380</b>

Note: The above table does not include all categories of ex-ante forecast capital expenditure; e.g. replacement capital expenditure is addressed in the Asset Management Strategy and business IT in the Information Technology Strategy.



**Table 3: Significant emerging network limitations (with proposed contingent project regulatory treatment)**

Name	Description	Estimated Timing	Indicative 2013-18 Cost (\$12-13m) <sup>4</sup>	Indicative Total Cost (\$12-13m) <sup>5</sup>
Lower Eyre Peninsula	Emerging limitation is 132 kV network and generation support reaching capacity. Potential significant mining loads would require reinforcement at 275 kV from Cultana. A RIT-T process has commenced.	2015-17	600	600-1000
Heywood Interconnector	Expected to increase net market benefit by increasing transfer capacity on the interconnector. A RIT-T process has commenced.	2015	100	100
Yorke Peninsula	Required due to 132 kV network reaching capacity. Reinforce from 275 kV west circuit running between Adelaide and Port Augusta. The required timing for this augmentation could be advanced by potential mining load.	2018	115	190
Fleurieu Peninsula	Required due to ETSA Utilities 66 kV network reaching capacity. Likely development is a 275 kV injection from Kanmantoo. Reduced ETSA Utilities demand forecast and short term fixes have deferred need for this transmission augmentation to at least 2019.	2020	10	200
Riverland	Required due to overload of 132 kV network under contingency conditions and reducing capability of Murraylink to support SA. Likely ultimate development is reinforcement of the Riverland at 275 kV from Robertstown.  However, ElectraNet has initiated work with AEMO and Murraylink to investigate optimal solutions for the Riverland taking into account potential developments in Victoria – the estimated timing assumes that this work will lead to deferral of the major investment requirement to 2024	2024	0	400

<sup>4</sup> Indicative prescribed services costs (\$nominal).

<sup>5</sup> Indicative total project costs (\$ nominal) (for Eyre Peninsula and Yorke Peninsula these costs will or are likely to include negotiated and non-regulated components).

In addition to the emerging limitations in Table 2, significant works are also likely to be required to service growing mining demand at Olympic Dam. A new double circuit 275 kV line from Davenport to Olympic Dam is expected to be required by 2016-17 at an indicative cost of up to \$480 million.

Should this proceed, it is intended to be the subject of a separate revenue proposal to the AER closer to when the development is required.

## 7. Benefits for Customers

Execution of this Network Development Strategy and associated capital expenditure program will provide the following benefits for customers – linked to the Network 2035 Vision objectives:

### **The network provides ongoing safety, reliability and security of supply**

This strategy underpins network safety, reliability and security of supply through integrated long-term network development planning and by investing in transmission network capacity, non-network solutions, telecommunications infrastructure and smarter technology to continue to meet growing customer demand and supply quality requirements and to be able to respond to network outages to restore supply in an acceptable timeframe.

### **The network delivers transmission services at lowest long-run cost**

This strategy supports the delivery of network services to customers at lowest long-run cost through the use of options to defer major network augmentations, alignment of network replacement and augmentation projects, and strategic purchase of land and easements to enable more efficient and timely future network development. This reflects a risk-based approach to investment decision making. Use of innovative solutions and new technology can also assist in improving network utilisation and providing more cost effective supply options.

The use of contingent projects also reduces the risks and up-front price impacts for South Australian consumers by not committing major investment funds until the need for investment has reached a sufficient level of certainty in relation to need, timing and cost. At the same time, this approach preserves the capability for timely delivery when that level of certainty is reached.

### **The network supports economic development and community prosperity**

This strategy supports economic development and community prosperity by promoting an efficient and reliable electricity transmission network. The network also facilitates economic development and employment in remote and regional areas by transporting electricity over long distances across South Australia. In particular, this strategy includes contingent projects for significant investments on the Eyre Peninsula, Yorke Peninsula and at Olympic Dam to address future demand created by forecast mining growth.

### **The network supports development of lower emission energy sources**

This strategy supports development of a lower emission energy future by developing the network in a flexible way to enable the connection of lower emission generators, e.g. wind farms.

## Appendix A SA Government Engagement Letter to AEMO

# 5836381



**Government of South Australia**  
Department for Transport,  
Energy and Infrastructure

Mr Matt Zema  
Chief Executive Officer  
Australian Energy Market Operator  
GPO Box 2008  
MELBOURNE VIC 3001

attention: Mr Tim George

ENERGY DIVISION  
Level 8  
11 Waymouth Street  
Adelaide SA 5000  
  
P O Box 1  
Walkerville SA 5081

Telephone: 08 8226 5500  
Facsimile: 08 8204 1730

ABN 92 386 286 135

### ELECTRANET REVENUE CAP - SCOPE OF AEMO ENGAGEMENT

Dear Mr Zema

I write to you requesting the engagement of the Australian Energy Market Operator (AEMO) as described in the attached *scope of AEMO engagement* document in regards to ElectraNet's upcoming revenue proposal to Australian Energy Regulator for the 2013-2018 Regulatory period.

The Energy Division of the Department for Transport, Energy and Infrastructure has reviewed the document, version dated 22 September 2011, and is supportive of AEMO's role in seeking to influence the following aspects of ElectraNet's Revenue proposal:

- Shared transmission network augmentations
- Connection asset augmentations
- Asset management (including replacement) capital expenditure, to the extent that the proposed work program may impact on longer term network developments.

Further, the document indicates that AEMO will be assessing both:

- The validity of the individual augmentation capital expenditure projects proposed by ElectraNet; and
- Whether the South Australian transmission network meets the requirements set out in the South Australian Electricity Transmission Code at the end of the Regulatory period.

The former Electricity Supply Industry Planning Council undertook similar independent advice in preparation for the current ElectraNet 2008-2013 regulatory control period.

I note that AEMO is proposing to undertake a desktop review of the proposed augmentation projects. It is critical that the analysis undertaken by AEMO identifies those areas of the network that are likely to require attention over the next regulatory

~~period to ensure that the network continues to meet the requirements of the Electricity Transmission Code and the National Electricity Rules.~~

Should the desktop review identify outcomes requiring further analysis, it is understood that AEMO could undertake some limited load-flow studies to identify cases of any network limitations so as to highlight the constraints identified and the capital expenditure work program proposed by ElectraNet. Considering that no market modelling is proposed, analysis of the projects that are considered to be strategically important would be highly desirable.

Further, there is value in the longer term strategic planning of the network to assess whether the need or trigger for proposed contingent projects is reasonable and whether other contingent projects should be included in ElectraNet's revenue proposal.

Yours Sincerely



Vince Duffy  
EXECUTIVE DIRECTOR  
ENERGY DIVISION

31 / 10 / 2011

## Appendix B Summary of ETC Reliability Requirements

Load Category	1	2	3	4	5
Generally Applies to....	Small loads Country radials Direct Connect Customers	Significant country radials	Medium sized loads with non-firm back up	Medium sized loads and large loads	Adelaide CBD
<b>Transmission line capacity</b>					
'N'	100% of Agreed MD				
'N-1' (any combination of Transmission, Distribution, Generation, Load interruptability)	Nil	100% of Agreed MD			
'N-1' continuous capability	Nil			100% of Agreed MD for single credible contingency event	
Restoration time to 'N' standard after outage	2 days (ASAP - best endeavours)		1 hour	12 hours, after multiple contingency events	4 hours for 65% of 'N' standard, after multiple contingency events
Restoration time to 'N-1' standard after outage	N/A		ASAP - best endeavours		
<b>Transformer capacity</b>					
'N'	100% of Agreed MD				
'N-1' (any combination of Transmission, Distribution, Generation, Load interruptability)	Nil	100% of Agreed MD			
'N-1' continuous capability	None stated			100% of Agreed MD for single credible contingency event	
Restoration time to 'N' standard after outage	8 days (ASAP - best endeavours)		1 hour	12 hours, after multiple contingency events	4 hours for 65% of 'N' standard, after multiple contingency events
Restoration time to 'N-1' standard after outage	N/A	ASAP - best endeavours			
Spare transformer requirement	Sufficient spares of each type to meet standards in the event of a failure				
Allowed period to comply with required contingency standard	N/A	12 months			

## Appendix C Connection Point Peak Demand Forecasts

**Table C.1: ETSA Utilities 2011 medium growth meshed connection point forecasts (MW)**

Connection Point	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EASTERN SUBURBS	781	798	858	877	896	916	936	956	977	999	1021
ADELAIDE CENTRAL REGION	228	233	242	247	256	266	271	277	283	289	295
SOUTHERN SUBURBS	812	861	844	865	886	907	929	952	974	996	1019
WESTERN SUBURBS	479	490	507	521	535	549	559	568	576	585	594
NORTHERN SUBURBS	380	392	412	433	451	469	488	511	531	551	572
PORT PIRIE SYSTEM	86	87	88	89	90	91	92	93	94	96	97

Note: The Eastern Suburbs load forecast incorporates the Adelaide Central Region.

**Table C.2: ETSA Utilities 2011 medium growth unmeshed connection point forecasts (MW)**

Connection Point	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
ANGAS CREEK	20.8	21.4	22.0	22.6	23.3	23.9	24.6	25.3	26.0	26.7	27.4
ARDROSSAN WEST	14.6	15.1	17.7	18.3	18.9	19.5	20.2	20.9	21.6	22.3	23.1
BAROOTA	8.9	9.0	9.2	9.4	9.5	9.7	9.8	10.0	10.2	10.4	10.5
BERRI	95.9	97.8	99.7	101.7	103.8	105.9	108.0	110.1	112.3	114.6	116.9
BLANCHE	36.7	37.5	38.4	39.2	45.1	46.1	47.1	48.1	49.2	50.2	51.3
BRINKWORTH	5.2	5.7	5.8	5.8	5.8	5.8	5.9	5.9	5.9	6.0	6.0
CLARE NORTH	13.4	14.0	14.6	15.3	16.0	16.7	17.5	18.2	19.1	19.9	20.8
DALRYMPLE	10.0	10.3	10.6	11.0	11.3	11.7	12.1	12.4	12.8	13.2	13.7
DAVENPORT WEST	32.9	33.6	34.2	34.8	35.5	36.2	36.9	37.6	38.3	39.0	39.7
DORRIEN	68.3	70.4	72.5	74.7	76.9	79.2	81.6	84.0	86.5	89.1	91.8
HUMMOCKS	14.7	14.9	13.5	14.1	14.7	15.4	16.1	16.9	17.6	18.4	19.3
KADINA EAST	27.6	28.9	30.2	31.5	32.9	34.4	36.0	37.6	39.3	41.1	42.9
KANMANTOO	1.9	2.0	2.2	2.4	2.5	2.7	3.0	3.2	3.5	3.7	4.0
KEITH	30.4	31.7	33.0	34.4	35.8	37.3	38.8	40.4	42.1	43.9	45.7
KINCRAIG	23.0	23.7	24.4	25.2	25.9	26.7	27.6	28.4	29.3	30.2	31.2
LEIGH CREEK SOUTH	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7

Connection Point	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
MANNUM	14.3	14.4	14.5	14.6	14.6	14.7	14.8	14.9	14.9	15.0	15.1
MOBILONG	42.5	44.2	45.8	47.6	49.4	51.3	53.2	55.2	57.3	59.5	61.8
MT BARKER	107.2	113.2	119.6	126.3	133.4	140.8	148.7	157.0	165.8	175.1	184.9
MT GAMBIER	27.9	28.3	28.8	29.2	24.6	25.0	25.4	25.8	26.1	26.5	26.9
MT GUNSON	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
NEUROODLA	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
NORTH WEST BEND	29.0	29.1	29.3	29.4	29.6	29.7	29.9	30.0	30.2	30.3	30.5
PENOLA WEST	13.7	14.0	14.2	14.5	14.8	15.1	15.4	15.6	15.9	16.2	16.6
PORT LINCOLN TERMINAL	44.7	46.5	48.4	50.4	52.5	54.6	56.9	59.2	61.7	64.2	66.9
SNUGGERY INDUSTRIAL	41.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
SNUGGERY RURAL	17.1	18.1	19.2	20.3	21.5	22.8	24.2	25.7	27.2	28.8	30.6
STONY POINT	0.6	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
TAILEM BEND	27.1	27.3	27.4	27.6	27.7	27.8	28.0	28.1	28.2	28.4	28.5
TEMPLERS	32.5	34.1	35.8	37.6	39.5	41.4	43.5	45.7	48.0	50.4	52.9
WHYALLA TERMINAL	91.9	92.6	93.3	94.0	94.7	95.4	96.2	96.9	97.7	98.4	99.2
WHYALLA LMF	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WUDINNA	15.7	15.9	16.1	16.4	16.6	16.9	17.1	17.4	17.7	17.9	18.2
YADNARIE	11.8	12.1	12.4	12.7	13.1	13.4	13.8	14.1	14.5	14.9	15.3

**Table C.3: 2011 direct connect customer connection point peak demand forecasts (MW)**

Connection Point	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
AGGREGATED TOTAL	303	308	318	374	412	450	456	456	456	456	456

Note: Excludes power station house supplies and potential major demand increases that would result in significant emerging limitations (e.g. Eyre Peninsula mining developments).

Source: ElectraNet Annual Planning Report, June 2011