TransGrid

ELECTRICITY NETWORK PERFORMANCE REPORT

2010/11

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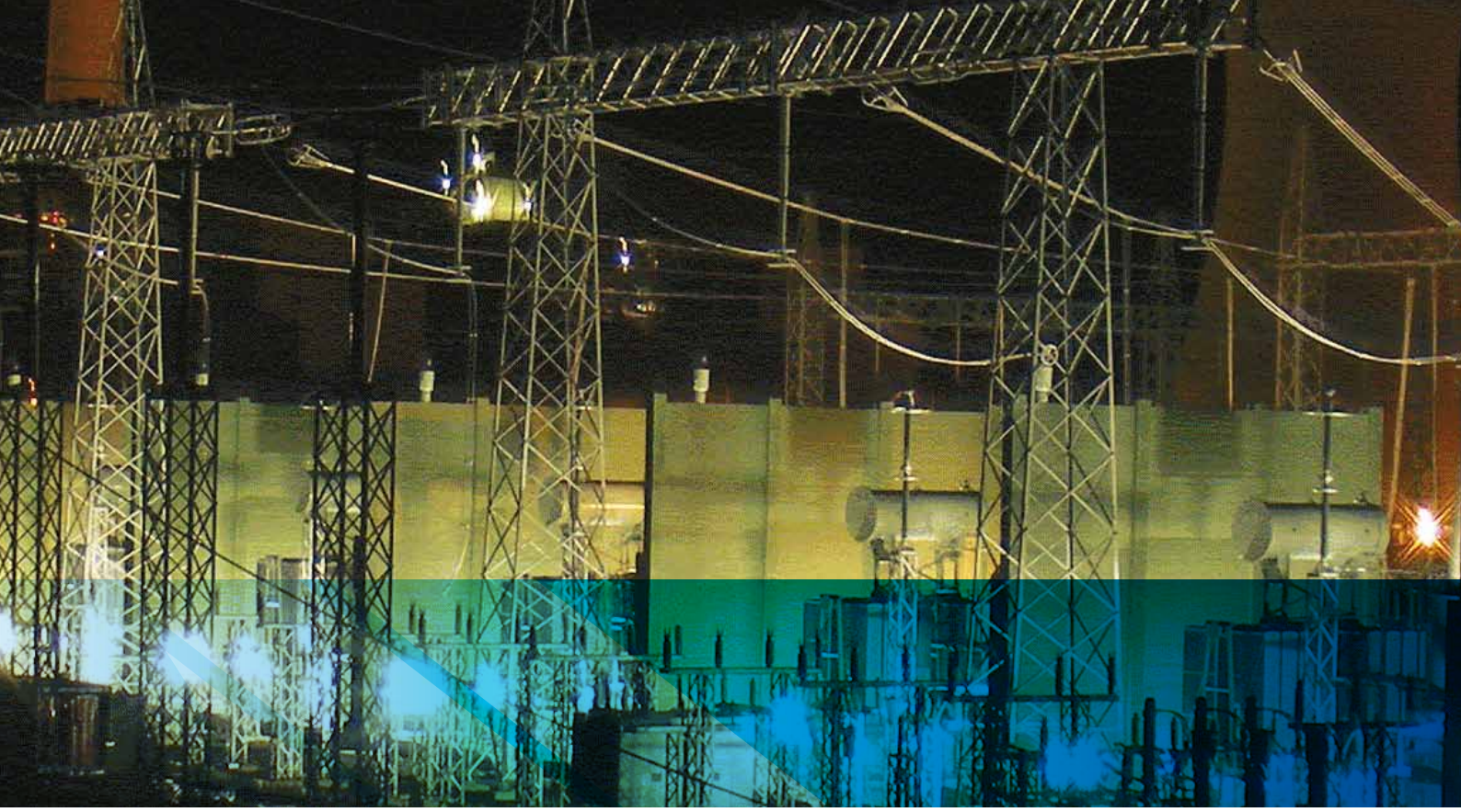


INTRODUCTION

This Electricity Network Performance Report has been prepared by TransGrid to fulfil the requirements of the Electricity Network Operator reporting regime and the Electricity Supply (Safety and Network Management) Regulation 2008.

This report outlines TransGrid's performance in meeting its NSW regulatory objectives for the 2010/11 Financial Year.

1. PROFILE

1.1 OVERVIEW

TransGrid is Australia's largest electricity transmission company with its network comprising some 12,656 kilometres of high voltage transmission line and underground cables, as well as 91 substations and switching stations, worth over $5.2 billion.

TransGrid is responsible for planning and developing the New South Wales transmission system to meet the requirements of customers within NSW and the ACT and to facilitate operation of the National Electricity Market.

The TransGrid network operates at voltage levels of 500, 330, 220 and 132 kilo volts (kV). TransGrid's substations and power station switchyards are located on land owned by TransGrid. Transmission lines are generally constructed on easements acquired across private or public land.

TransGrid has a number of key challenges including the management of a large capital works program for the 2009-2014 regulatory period aimed at meeting the increasing peak demand for electricity and thereby securing the energy future of NSW.

TransGrid has staff strategically based at locations throughout NSW. They are responsible for the day to day operation and maintenance activities along with emergency response capability. The main administrative office is located at 201 Elizabeth Street, Sydney. Field staff are co-ordinated from major depots located in Tamworth, Newcastle, Orange, Western Sydney, Yass and Wagga Wagga.

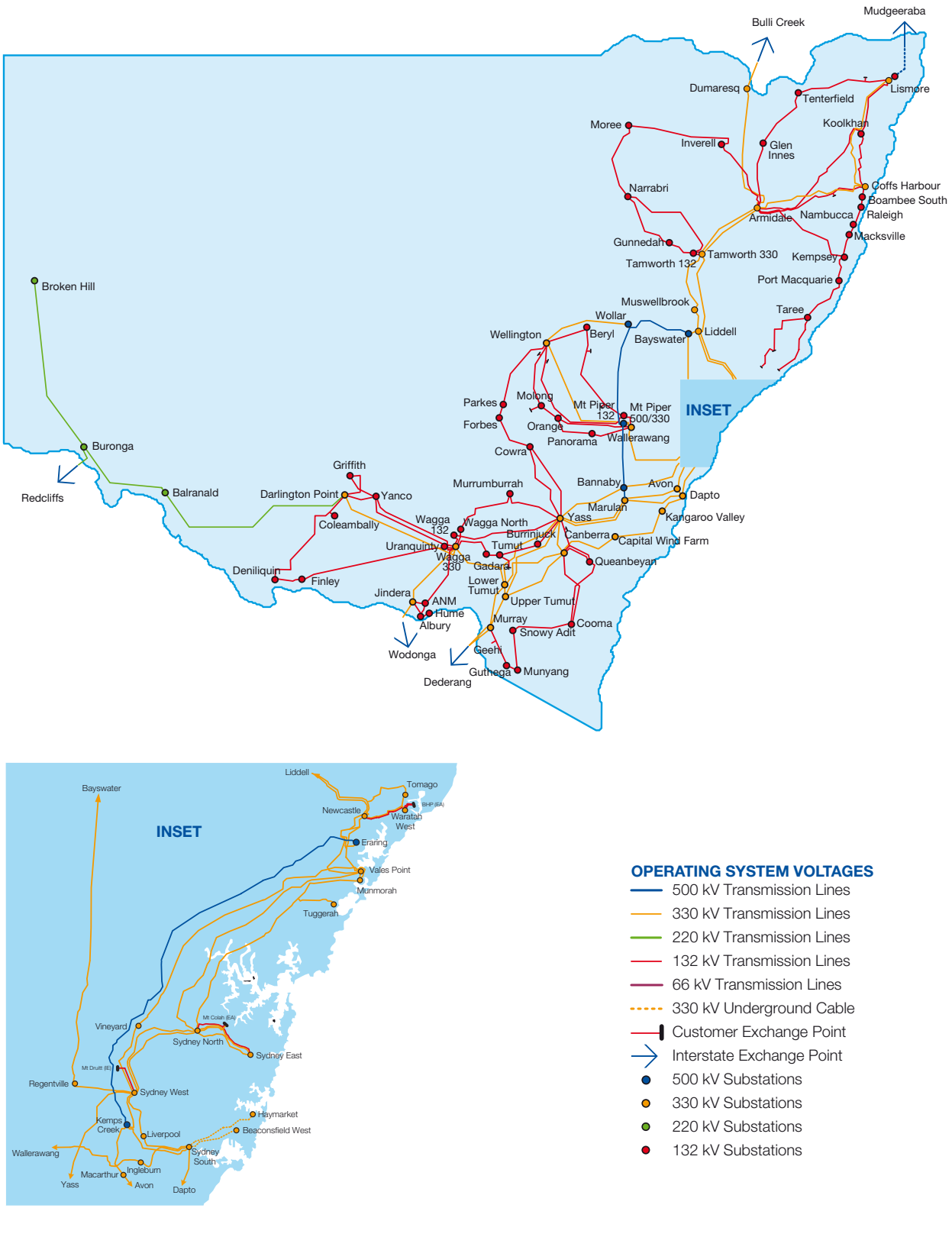
Table 1.1 Network Operator Statistics

	Number at end of 2009/10	Number at end of 2010/11
Customer Numbers (Total)	13	14
Maximum Demand (Aggregated System MW)	14,051	14,820
Energy Received to Year End (GWh)	72,814	71,916
System Loss Factor (%)	3.1%	4%[1]
High Voltage Overhead (km)	12,609	12,610
High Voltage Underground (km)	47	47
Substation (Number)	91	91
Structures (Number)	36,483	36,349
Poles (Number)	38,480	38,440[2]
Employees (Full Time Equivalent Number)	1,017	1,027
Contractors (Full Time Equivalent Number)	287	387[3]

Notes:

1. The difference in the System Loss Factor figure between the previous reporting year and the current year is due to a change in the definition of the energy transmitted parameter used in the System Loss Factor calculation. TransGrid has modified its definition to take into account only the energy that passes through TransGrid's system. It includes embedded generation directly connected to TransGrid's network as well as energy delivered to auxiliary loads.
2. Existing wood pole structures are typically constructed of multiple poles. When they are replaced a single concrete pole is used.
3. Contractor numbers are largely dependant on capital works projects and vary depending on the number and type of projects being undertaken.

Figure 1.1 Network Map



1.2 CAPITAL WORKS PROGRAM

Peak demand on the NSW electricity transmission network is growing. February 2011 saw a new all time peak demand of 14,820 MW. TransGrid's large capital works program is needed to ensure the NSW electricity transmission network continues to deliver the secure, reliable and safe supply of electricity to businesses and consumers in the NSW and ACT. TransGrid also has an ongoing program of refurbishment and replacement of ageing assets to ensure reliable supply to all customers.

Between 2009 and 2014 TransGrid will undertake more than 88 projects across NSW as part of a $2.6 billion capital works program. For the 2010/11 financial year TransGrid's capital expenditure was $378.6 million.

Table 1.2 shows TransGrid's capital expenditure in the last 5 financial years.

1.2.1 RECENTLY COMPLETED PROJECTS

Western 500 kV Conversion Project

To meet limitations in the main transmission network supplying the Newcastle/Sydney/Wollongong load area TransGrid undertook:

- Development of non-network projects to provide 350 MW of network support capability for the Newcastle – Sydney – Wollongong area for summer 2008/09; and
- Conversion of the existing Bayswater – Mount Piper and Mount Piper – Bannaby lines, which operated at 330 kV, to operate at their design voltage of 500 kV.

These works did not entail major line works but involved significant 500 kV and some 330 kV substation works at Bayswater and Mount Piper Power Stations and the establishment of new 500/330 kV Substations at Bannaby and Wollar. It also involved the reconnection of two generating units at Bayswater from the 330 kV switchyard to the new 500 kV switchyard.

Establishment of Tomago Supply Point

To meet present and emerging limitations in the network supplying the Newcastle and lower mid north coast areas TransGrid and Ausgrid completed the following works:

- Establishment of a 330/132 kV substation at Tomago adjacent to Tomago 330 kV Switching Station with two 330/132 kV 375 MVA transformers;
- Construction of three short double circuit 132 kV lines between Tomago and suitable points in Ausgrid's 132 kV network north of Tomago and rearrangement of that network;
- Installation of a 330 kV busbar and a second 330/132 kV 375 MVA transformer at Waratah West 330/132 kV Substation;
- Conversion of the Newcastle – Waratah West 132 kV circuit 95N to 330 kV operation; and
- Installation of 330 kV and 132 kV switchgear to support the above.

Other Projects

- Upgrading of 86 Tamworth-Armidale 330 kV Line.
- Sydney South-Beaconsfield West 330 kV Cable series reactor replacement.
- Completed line switchbays for distributor requirement at Port Macquarie 132 kV Substation.
- Completed fault rating upgrade at Dapto 330 kV Substation.
- Transformer replacements and capacity upgrades at Sydney North and Sydney South 330 kV Substations.

Table 1.2 Capital Works Program Trend

	Previous Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Capital works program ($m)	218.2	355.0	619.9[1]	428.7	378.6

Notes:

1. The peak in capital expenditure during the 2008/09 period was due to the completion of the major components of the Western 500 kV project, the completion of Macarthur 330 kV substation, and Wagga North 132 kV substation.

2. NETWORK MANAGEMENT

2.1 OVERVIEW

In the 2010/11 financial year TransGrid has commenced a number of new initiatives related to improving the management of the transmission network. These include:

- The introduction of a Portfolio Management Office to manage the project portfolio through the planning process until a defined project is assigned to a project manager. Following handover to a project manger the Portfolio Management Office will monitor the progress of projects through the construction phase. The Portfolio Management Office will also be responsible for optimising the delivery of augmentation and asset replacement projects.
- Commencement of Project Symphony, a business transformation project to further integrate the way TransGrid conducts its business. The upgrade of the Ellipse and Oracle corporate information systems are part of this project.
- At the 2010 SAI Global Systems Excellence Awards TransGrid was the winner in two categories, Environmental Management Systems and Integrated Management Systems.

2.2 NETWORK COMPLAINTS

There were 3 complaints registered during the reporting period that directly related to TransGrid.

One complaint claimed that TransGrid had not notified the National Parks & Wildlife Service of works on the Illawarra escarpment in accordance with the terms of the agreed MOU. Further investigation showed that appropriate processes had been followed and that correct notifications had in fact been made.

A second complaint related to paperwork for the transport of PCB free waste oil not being supplied by a TransGrid contractor to the ACT Department of the Environment, Climate Change, Energy and Water.

The third complaint related to outstanding superannuation payments by a contractor to a sub-contractor and was raised with TransGrid as the Principal. The TransGrid project manager confirmed that appropriate quality processes were in place relating to the TransGrid contract and referred the complainant to the appropriate avenue to raise the issue.

All of these issues have been addressed.

The complaints performance data is set out in Table 2.1. The higher levels experienced between 2007/08 and 2009/10 are linked to complaints regarding transmission line developments, and usually arise during the community consultation and route selection phase of the project.

Table 2.1 Complaint Performance Data

	Previous Years				Current Year
Years	2006/07	2007/08	2008/09	2009/10	2010/11
Complaints Total	9	27	92	20	3
Complaints regarding Vegetation Management	2	4	1	1	1

3. NETWORK PLANNING

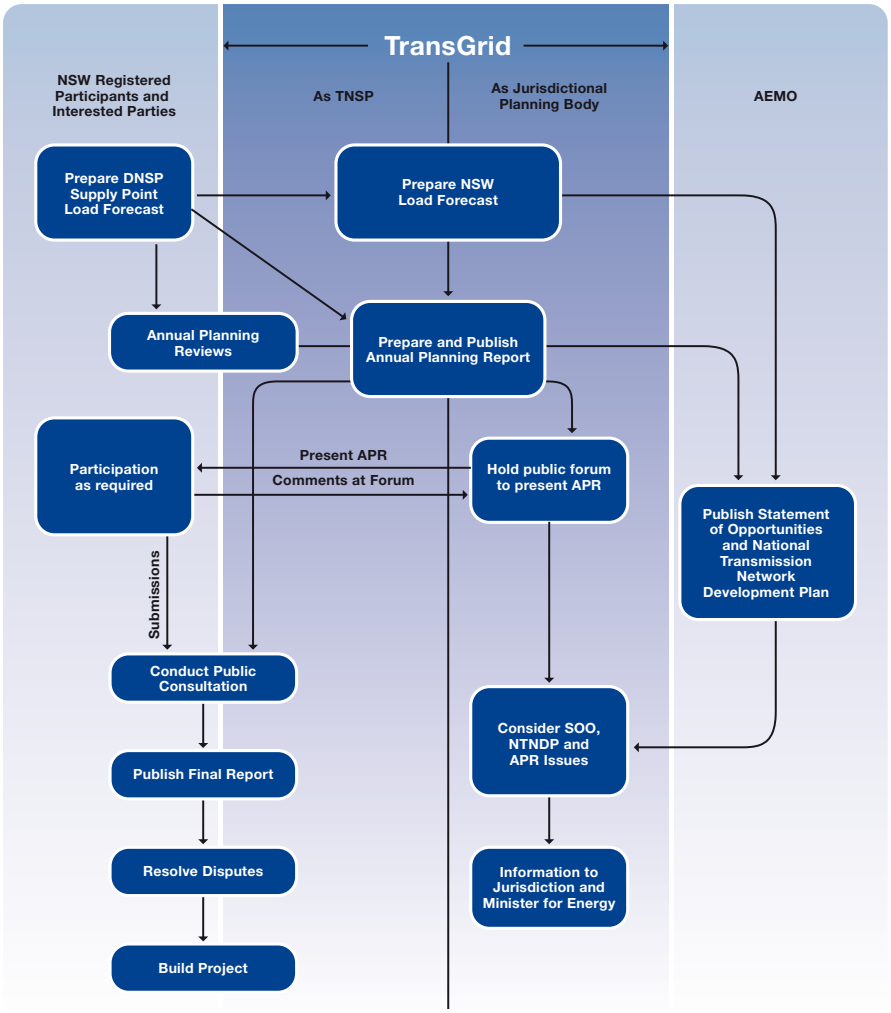
3.1 OVERVIEW

TransGrid carries out planning in accordance with its regulatory obligations under the National Electricity Rules (NER), Jurisdictional requirements and customer expectations. As the Jurisdictional Planning Body (JPB) for NSW, TransGrid works with the Australian Energy Market Operator (AEMO) to provide input to the Electricity Statement of Opportunities (ESOO) and National Transmission Network Development Plan.

As a registered Transmission Network Service Provider (TNSP) in the National Electricity Market (NEM), TransGrid is required to perform a yearly planning review and produce an Annual Planning Report (APR 2011) with information relevant to supply demand balance, transmission network planning and distribution network planning.

The roles of AEMO, TransGrid and other parties in the planning process are set out in Figure 2.1.

Figure 3.1 TransGrid's Planning Roles



3.2 SYSTEM DESIGN CRITERIA (PLANNING STANDARDS)

Under NSW legislation, TransGrid has responsibilities that encompass the planning for future NSW transmission needs, including interconnections with other networks. The NSW Government has specified the Transmission Network Design and Reliability Standard to be applied by TransGrid.

In addition, as a TNSP in the NEM, TransGrid is obliged to meet the requirements of Schedule 5.1 of the NER. In particular, TransGrid is obliged to meet the requirements of clause S5.1.2.

The NER sets out the required processes for developing networks as well as minimum performance requirements of the network in a range of areas some of which are contingency events, power transfer capability, power, voltage, frequency, supply quality, line ratings and protection systems. It also requires TransGrid to consult with AEMO, Registered Participants, and interested parties and to apply the AER's Regulatory Investment Test for Transmission (RIT-T) to development proposals.

In meeting these obligations TransGrid's approach to network planning is socially and economically based and is consistent with both the NER and the RIT-T. It includes consideration of non-network options such as demand side response (DSR) and demand management (DM) and/or embedded generation, as an integral part of the planning process. Joint planning with Distribution Network Service Providers (DNSPs), directly

supplied industrial customers, generators and interstate TNSPs is carried out to ensure that the most economic options, whether network options or non-network options are identified and implemented to meet customer, community and regulatory requirements.

In addition to meeting requirements imposed by the NER, environmental legislation and other statutory instruments, TransGrid is required by the NSW Government to plan and develop its transmission network on an "n-1" basis. That is, unless specifically agreed otherwise by TransGrid and the affected distribution network owner or directly connected end-use customer, there will be no loss of load (other than load which is interruptible or dispatchable) following the occurrence of a credible contingency on the network, during periods of high load. In fulfilling this obligation, TransGrid must recognise specific customer requirements as well as AEMO's role as system operator for the NEM.

TransGrid's planning obligations are also interlinked with the licence obligations placed on DNSPs in NSW. TransGrid must ensure that the system is adequately planned to enable their licence requirements to be met. For instance, if the mandatory DNSP license obligation is an "n-1, 1 minute" reliability standard for sub-transmission lines and zone substations supplying loads greater than or equal to specified minimums, eg 15 MVA in urban and non-urban areas, the requirement imposes a consequential obligation on TransGrid to provide a commensurate level of reliability in its network supplying the sub-transmission line or zone substation. In addition to adherence to NER and regulatory requirements, TransGrid's transmission planning approach takes into account the historical performance of the components of the NSW system, the sensitivity of loads to supply interruption and asset maintenance procedures. It has also been recognised that there is a need for an orderly development of the system taking into account the long-term requirements of the system to meet future load and generation developments.

3.3 DEMAND MANAGEMENT

The primary driver for investment in new assets on the NSW transmission network is the increase in peak demand. As demand increases, system constraints emerge as the maximum capability of existing assets is reached. Traditionally, to relieve constraints investments in new transmission assets have been made. However, if the peak demand can be managed, it is possible to reduce, defer or eliminate the need for new transmission investment and thereby reduce the costs and environmental impacts associated with construction of new assets.

During the assessment of options to address an emerging constraint, demand management is referred to as a non-network option. Non-network options are broadly defined under the four categories of demand management, demand side response, embedded generation and local generation.

Demand Management or Demand Side Reponses

DM or DSR options may include, but are not limited to, combinations of the following:

- Reduction in electricity demand at points of end-use by using energy efficiency systems, renewable and reticulated energy sources, etc.
- Reduction in peak electricity consumption at points of end-use through tariff and load curtailment incentives, energy storage systems, standby generators, power factor correction, etc.

Embedded or Local Generation

Embedded or local generation options may include generation or cogeneration facilities located on the load side of a transmission constraint. Alternative energy sources such as bagasse, biomass, gas, hydro, solar, wind, etc

TransGrid actively promotes these non-network options by informing the market on constraints via the APR, external consultations, joint planning and reviews with distributors and joint sponsorship of research projects.

3.3.1 CONSIDERATION OF NON-NETWORK OPTIONS BY TRANSGRID

The Annual Planning Report provides advance information to the market on the nature and location of emerging network constraints. This is intended to encourage interested parties to formulate and propose feasible non-network options to relieve emerging network constraints.

TransGrid considers non-network options on an equal footing with network options when planning its network augmentations and applying the AER's regulatory investment test.

For a non-network option to be considered during the evaluation and analysis process, it must be feasible and capable of being implemented in time to relieve the emerging constraint. The option can then be recommended and implemented if it satisfies the RIT-T regulatory test.

It is expected that DM and local/embedded generation options would emerge from joint planning with DNSPs, from the market or from interested parties.

3.3.2 PRICE SIGNALS AND FINANCIAL INCENTIVES TO ENCOURAGE DM AND LOCAL GENERATION

TransGrid is a provider of bulk transmission network services and is best placed to implement 'bulk' DM options. For instance, a monthly maximum demand charge on customers encourages the implementation of demand side response at the time of maximum demand on the transmission network.

Additionally, TransGrid can and does provide financial incentives via direct payments under network support contracts with wholesale suppliers of demand reductions such as larger end users or embedded generators or DM aggregators. Contractual payments to smaller suppliers of DM are now proving practical for TransGrid with the advent of DM aggregators. The regulatory incentive framework is evolving to provide improved commercial incentives for TransGrid to engage in these activities.

3.3.3 RECENT NON-NETWORK PROJECTS

Sydney Inner Metropolitan Area Non-Network Project

A major system augmentation project for reinforcing supplies to the Sydney inner metropolitan area had been planned for summer 2012/13. However, a revised load forecast and further system studies allowed the project commissioning to be deferred to summer 2013/14.

TransGrid has published a Request for Proposal (RFP) to seek network support for summer 2013/14 and possibly summer 2014/15 to further defer the project by 1 to 2 years if sufficient capacity was offered and cost proved to be commercially prudent. It also sought network support for summer 2012/13 as an operational risk management measure and to cater for development uncertainties for planning three years ahead.

The RFP closed and the single compliant proposal offered only part of the required capacity of network support. It is therefore not possible to further defer the project. However, TransGrid has contracted 20 MW of network support for summer 2012/13 for operational risk management purposes.

The Far North Coast Non-Network Project

The Lismore – Dumaresq 330 kV transmission line project had been planned for completion by summer 2011/12. This project was included in TransGrid's revenue reset proposal for 2009-2014 regulatory control period.

A RFP document for non-network solutions has been issued in May 2010 and responses were received in mid July 2010. The offers received do not provide adequate support to the Far North Coast system to defer augmentation works.

In 2011 Essential Energy submitted a revised load forecast that shows some moderation in growth from that previously being experienced. It is believed that the global financial crisis as well as the increase in electricity prices has contributed to this moderation in growth. Based on this load forecast the line is now required at the earliest by summer 2015/16. Load growth is being carefully monitored to determine whether further deferment of the line is possible.

The Mid North Coast Non-Network Project

In December 2010, TransGrid issued a RFP seeking network support for three years starting in summer 2016/17. Submissions in response to RFP Q130/10 closed in April 2011. TransGrid is currently evaluating the received offers.

3.3.4 FUTURE DM AND OTHER NON-NETWORK PROJECTS

DM projects and initiatives that TransGrid is likely to implement in the next five years include:

- → Projects with the NSW DNSPs to cooperate on demand management innovation for which TransGrid has signed agreements. Joint projects include initiatives to reduce peak demand and some research and development projects;
- → Development of a Non-Network & DM Triage Database;
- → Provision of Network Support and Control Ancillary Service (NSCAS) to provide reactive power support for main system security and reliability;
- → Provision of network support, possibly from non-network sources, to improve the power transfer capability between the Snowy Mountains and Yass/Canberra;
- → Provision of network support for Gunnedah-Narrabri-Moree area;
- → Provision of network support for the South Coast area.

4. ASSET MANAGEMENT

4.1 OVERVIEW

TransGrid has developed an Asset Management model that is based on the NSW Government's Total Asset Management Model.

TransGrid strives to meet availability, reliability, environmental, and safety objectives through efficient implementation of policies and procedures across every phase of the asset management lifecycle. These policies and procedures have been designed within a risk management framework to ensure that their implementation is carried out to achieve OHS, environmental, and regulatory requirements.

The performance of the network is constantly monitored and Asset Management Strategies and Maintenance Policies are updated to ensure that asset performance objectives are met.

4.2 TECHNICAL SERVICE STANDARDS

The AER Service Target Performance Incentive Scheme sets out TransGrid's primary customer service standards. The measures are:

- → Reliability, based on the number of Energy not Served events.
- → Availability, based on transmission line, transformer, and reactive plant availability.
- → Average unplanned-outage duration.
- → Market impact of transmission congestion.

Further details of this scheme are available in the Service Target Performance Incentive Scheme Guideline published by the AER, available on its website.

4.3 TRANSMISSION RELIABILITY

Of TransGrid's 14 connected customers, 9 did not experience any unplanned outages causing loss of supply or interruption to generation. Three distribution customers, Ausgrid, Endeavour Energy and Essential Energy, experienced loss of supply from unplanned outages. Two generator customers, Macquarie Generation and Snowy Hydro, experienced interruptions to generation.

The adverse weather of Summer 2010/11 only had a minor impact on TransGrid's operations.

Table 4.1 Network Reliability Trend (Off Supply Event Numbers)

		Years				
	Objective	2006/07	2007/08	2008/09	2009/10	2010/11
Measure A	No. > 0.05 system minutes	1	3	3	4	2
Measure B	No. > 0.25 system minutes	1	0	0	1	1

Table 4.2 Average Unplanned Outage Duration (Minutes) Trend

	Years				
Objective	2006/07	2007/08	2008/09	2009/10	2010/11
824	613	843	862	607	926[1]

Note:

1. The result is higher than the objective in this measure due to 3 reactive plant of outages which reached the outage duration cap of 7 days and an additional capacitor bank outage lasting 5.6 days.

Table 4.3 Connection Point Interruptions (Unplanned) Current Year

Connection Point Interruptions (Unplanned) Current Year		
Connection Point	Interruption Number	Interruption Duration Total (Minutes)
Ausgrid		
251 Sydney North – Pennant Hills 132 kV Line	1	974
250 Sydney North – Berowra 132 kV Line	3	238
Endeavour Energy		
234 Vineyard – Hawkesbury 132 kV Line	1	5
Essential Energy		
887 Glen Innes – Glen Innes 66 kV Line	1	12
79F Griffith – Yenda 33 kV Line	2	175
858 Forbes – Forbes Town 66 kV Line	1	28
859 Forbes – Forbes Town 66 kV Line	1	28
863 Cowra – Canowindra 66 kV Line	1	150
865 Cowra – Cowra Town 66 kV Line	1	150
866 Cowra – Cowra Town 66 kV Line	1	150
891 Cowra – Young tee Wyangala 66 kV Line	1	150
893/1 Cowra – Grenfell 66 kV Line	1	150
893/5 Forbes – Payten's Bridge 66 kV Line	1	28
895 Forbes – Parkes 66 kV Line	1	28
896 Forbes – West Jemalong 66 kV Line	1	28
7G2 Taree – Council Harrington tee Coopernook 33 kV Line	1	30
No.5 Taree – Council Kanangra Drive 33 kV Line	1	31
Macquarie Generation		
Bayswater – No.2 Generator	1	69
Snowy Hydro		
Guthega – No.1 Generator	1	258
Guthega – No.2 Generator	2	259
Guthega – 97L Jindabyne Pumps 132 kV Line	1	706[1]
Murray – M7 Murray No.7 and No.8 Generator	2	1,312[2]

Notes:

1. The interruption was caused by simultaneous trips of lines 97K and 97L due to a lighting strike in the vicinity of the double circuit section shared by these two lines. Line 97K auto reclosed. Line 97L was restored the next day after intertrips at Jindabyne Pumping Station were reset by Snowy Hydro.
2. Both interruptions were caused by the same faulty low voltage current transformer cable. The line was returned to service following repair of the cable.

Table 4.4 Connection Point Numbers End Current Year

Connection Point Numbers End Current Year	
Number of Connection Points (Total Number)	432

4.4 TRANSMISSION AVAILABILITY

Table 4.5 Transmission Asset Availability (%) Trend

		Years				
	Objective	2006/07	2007/08	2008/09	2009/10	2010/11
Transmission Lines	99.26	99.44	98.55	98.44	98.17	98.99
Transformers	98.61	98.16	97.69	98.42	98.60	98.43
Reactive Plant	99.12	99.96	98.97	98.96	96.35	95.71

Notes:

1. A measure of the circuit availability compared to the total availability if no outages had occurred.
2. Outages will generally occur for maintenance and augmentation works, thus 100 per cent is inherently unachievable.

Transmission line availability is below the target due to uprating and refurbishment work on transmission lines not originally scheduled in 2010/11. Transformer availability is slightly below the target due to longer than expected outages for transformer replacements. Reactive plant availability is below the target due mainly to some plant reaching end of life, for which there is a replacement project scheduled.

Table 4.6 Market Impact of Transmission Constraint Performance (Events) Trend

Market Impact of Transmission Constraints Trend					
	Years				
Objective	2006/07	2007/08	2008/09	2009/10	2010/11
2857	N/A[1]	N/A	N/A	1770	831

Note:

1. The MITC service standard commenced for TransGrid at the beginning of the 2009 financial year.

5. NETWORK SAFETY

5.1 OVERVIEW

TransGrid's goal is zero injuries, occupational illnesses and incidents. Our first priority is the health and safety of our people, our contractors, visitors and the public. Our strategies are aimed at continually improving our performance and maintaining a major focus on risk management.

Our Health & Safety Management System is certified to Australian Standard AS/NZS 4801. TransGrid also holds a self insurer licence for workers compensation.

TransGrid's Health & Safety Management System is overseen by the Executive Occupational Health and Safety (OHS) Committee which is chaired by the Managing Director and includes the Executive General Manager or senior management representative from each business unit. In addition, a number of strategies during the year have been developed, implemented and monitored to ensure the system is effective and provides for continuous improvement. These include:

- Safety Improvement Program;
- Corporate Health and Safety Plan;
- Safety Communications Steering Committee;
- Quarterly Health and Safety Themes;
- Annual Safety Day – First Aid, Fire Fighting and Risk Assessment competitions;
- Schedule of compliance audits and inspections;
- The Wire (intranet) – maintains relevant OHS information accessible to all employees; and
- Membership and participation in various industry committees, working groups and Field Days.

In 2011/12 the above strategies will continue with a focus on:

- health & safety behaviours;
- electrical safety;
- contractor safety;
- Wellbeing and health; and
- Health and Safety know how.

Corporate Health and Safety Plan

This Plan sets out TransGrid's objectives, targets and key strategies for the year and is the basis for the development of business unit Health and Safety Action Plans. Progress reports on each business unit's Action Plan are reviewed by the Executive OHS Committee on a quarterly basis.

A Corporate Health and Safety Plan 2011/12 has been developed, communicated and cascaded through the business where Business Units develop their own unique health and safety plan and measures based on the corporate plan and the local health and safety risks. Progress on the implementation of the Corporate and Business Unit Heath and Safety Plans are reported to the Executive OHS Committee quarterly.

Wellbeing

The TransGrid "Wellbeing" Program has the vision "to promote living a healthy, happy and productive life by making personal choices that contribute to a healthy and balanced lifestyle". The Program provides principles, policies and programs to support employees in the following areas:

- Physical Wellbeing – Maintaining healthy and energetic bodies by making informed choices about exercise, diet and general fitness.
- Emotional Wellbeing – The peace of mind, confidence, and self-respect that we achieve by coming to terms with the full range of emotions.
- Social Wellbeing – Recognising the value and contribution of the relationships with family, colleagues and the community.
- Financial Wellbeing – A sense of comfort and security that results from informed financial decisions that help us achieve our life goals.

Chairman's Safety Award

The annual Chairman's Safety Award recognises an individual or team who has made a significant contribution to safety in TransGrid throughout the year. The 2011 winners were the TransGrid Be SafeKidz Sponsorship team. The Be SafeKidz team has been conducting school visits in the areas around TransGrid capital projects. The program includes a presentation on safety, the history of electricity, TransGrid and the National Electricity Market. This is followed by a visit to a TransGrid site or participation in an environmental activity.

Annual Safety Day

TransGrid's annual Safety Day is in its 53rd year. Competition events include an Apprentice Wiring Challenge, Risk Assessment, First Aid and Fire Fighting for teams representing all areas of TransGrid. This was held in Newcastle in August 2011. The participation rate on the day was high with participants responding to various injuries and scenarios.

TransGrid's Safety Day helps to reinforce TransGrid's emphasis on safety as the number one priority. The day helps to hone safety skills which positively

influence a sustained safety culture in the workplace. It is also an opportunity to display and discuss issues relating to safety and well being.

Schedule of Compliance Audits and Inspections

Compliance audits and inspections are conducted to ensure that procedures are implemented in accordance with legislative and organisational requirements. These include OHS system audits, random unannounced safety compliance inspections, site conformance inspections, OHS audits on contractors and team leader audits of pre-work risk assessments. Non conformances identified in audits are reported and actions are tracked.

OHS Audit reports provided by internal and external auditors reflect a strong OHS commitment, understanding and performance across TransGrid.

Participation in Industry Committees

TransGrid takes an active role in a number of industry committees and working groups such as Energy Networks Association's Health, Safety and Environment Committee, WorkCover Industry Reference Group and the Department of Trade and Investment, Regional Infrastructure and Services NSW Industry Safety Steering Committee. Participation ensures that trends and expectations of legislators, industry and the community are understood and managed effectively. Compliance to these requirements was demonstrated by nil infringements or prosecutions.

5.2 SERIOUS ELECTRICITY NETWORK ACCIDENTS (PUBLIC)

In the 2010/11 financial year there were no Serious Electricity Network Accidents where members of the public were involved.

Table 5.1 Serious Electricity Network Accidents (Public) Trend

	Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Non-Fatal	0	0	0	0	0
Fatal	0	0	0	0	0

5.3 ACTIONABLE ELECTRICITY NETWORK SAFETY INCIDENTS (PUBLIC)

In the 2010/11 financial year there were no Actionable Electricity Network Safety Incidents where members of the public were involved.

Table 5.2 Actionable Safety Incidents (Public) on the Electricity Network Summary Trend

Category of Incident	Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Total	1	0	1	0	0

5.4 SERIOUS ELECTRICITY NETWORK ACCIDENTS (NETWORK WORKER)

In the 2010/11 financial year there were two Serious Electricity Network Accidents involving contractors:

Table 5.3 Serious Accidents (Network Worker) on the Electricity Network Trend

	Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Network Operator Employees	0	0	1	1	0
Network Operator Contractors	0	0	0	1	2

The first serious electricity network accident occurred at Waratah West Substation on 14 September 2010. Contractors were terminating an 11 kV cable when High Voltage test volts were transferred from the remote end of the cable resulting in the workers receiving an electric shock. At the time of testing it was believed the cable had been disconnected, shorted and earthed. However, the earthing bar to which it had been connected had not been earthed. All testing was suspended until the contractor had amended their Work Method Statement and satisfied TransGrid that its processes would avoid a similar incident in the future.

The second serious electricity network accident occurred at Sydney East Substation on 16 September 2010. During plant replacement works a civil works contractor was fatally injured when an earth grid connection was broken inappropriately. A full investigation of the accident has been undertaken through a committee of enquiry established by TransGrid. The matter is also the subject of a WorkCover investigation which is still open. While the committee of enquiry found that had the Safety Rules been followed the accident would not have occurred, TransGrid has implemented a number of additional measures and controls around excavation and earth grid work in switchyards.

5.5 ACTIONABLE ELECTRICITY NETWORK SAFETY INCIDENTS (NETWORK WORKERS)

In the 2010/11 financial year there were no Actionable Electricity Network incidents involving contractors:

Table 5.4 Actionable Safety Incidents (Network Workers) on the Electricity Network Summary Trend

Category of Incident	Previous Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Total	0	1	0	0	0

6. BUSH FIRE RISK MANAGEMENT

6.1 BUSH FIRE RISK MANAGEMENT PLAN

TransGrid's Bush Fire Risk Management Plan is published on TransGrid's website as Chapter 4 of the Network Management Plan 2011-2016. A previous revision of the plan was subject to external audit and found to comply with the requirements of the then in force Electricity Supply (Safety and Network Management) Regulation 2002 in relation to TransGrid's transmission network assets. Some minor improvements to the plan recommended in the audit report were included in the subsequent revision and carry through to the current plan.

6.2 BUSH FIRE RISK MANAGEMENT PERFORMANCE

6.2.1 NETWORK PERFORMANCE

TransGrid's network performed very well during the 2010/11 reporting period. There were no incidents of fire ignited by network assets. The following table summarises the performance outcomes, and compares these to the previous year's performance:

6.3 AUDITS

6.3.1 TECHNICAL PERFORMANCE ASSESSMENTS

Technical Performance Assessments (TPAs) are undertaken annually in each of TransGrid's three Regions to audit maintenance and inspection compliance to TransGrid's policies. In 2010/11 TPAs were undertaken in Northern Region (Tamworth Area), Central Region (Orange Area) and Southern Region (Yass Area). No bush fire risk non-compliance issues were identified by these TPAs.

Table 6.1 Bushfire Risk Management

	Years				Current Year
Year	2006/07	2007/08	2008/09	2009/10	2010/11
Assets in bush fire prone areas checked by pre-summer inspection %	100	100	100	100	100
Private lines in bush fire prone areas checked by pre-summer inspection %	N/A	N/A	N/A	N/A	N/A
Fire ignitions by network assets (Number)	0	1	1	1	0
Complaints from the public regarding preparation for the bush fire season (Number)	0	0	0	0	0

6.4 PREVENTATIVE PROGRAMS

TransGrid's preventative program is centred on its routine easement maintenance. Inspection of transmission line hardware and accessories provides further confidence in the reliability of the system to not pose a bushfire ignition risk, and to remain safe during any bushfire occurrence in the area.

6.5 PROACTIVE PROGRAMS

TransGrid provides corresponding representation to Bush Fire Management Committees (BFMCs) as detailed in Attachment 2 of document GD AS G2 006 – Administration of the Network Management Plan. When required, the meetings are attended by a regional representative providing advice on matters such as the impact proposed hazard reduction burns will have on TransGrid lines and recommendations are made on how to protect these assets prior to the commencement of a burn.

TransGrid has also provided advice to the relevant BFMCs that TransGrid easements can be maintained, particularly in NPWS and State Forest managed estates, in a manner such that they can be utilised as Strategic Fire Advantage Zones. Some easements are now being managed in cooperation with these agencies to provide these zones.

Reference should also be made to TransGrid's Public Electrical Safety Awareness (PESA) plan (Chapter 3 of the Network Management Plan 2011-2016) that provides a strategy for the communication of the fire hazards associated with overhead power lines and vegetation and other electrical safety initiatives.

6.6 AERIAL LASER SURVEYS

TransGrid has completed a project to conduct Aerial Laser Surveys of all of its transmission lines for the purpose of obtaining accurate and up to date electronic data of these assets. It is only with the advent of this technology that it has been possible to accurately measure the as built profiles of such lines.

Results received from these surveys have identified spans on a number of transmission lines in NSW that have clearances to ground below those specified in the relevant guideline, if they were operated at their maximum operating temperatures. The possible consequences of low clearances can include:

- flashovers to the ground tripping the line;
- flashovers to vegetation that can start a bushfire; and
- flashovers to vehicles or people under the line.

A risk management approach has been undertaken to manage these assets in the time until final designs are prepared and works can be carried out efficiently. This risk management approach has considered historical loading on the lines and combined this with statistical conductor temperature monitoring to assess the locations where maximum expected temperatures may infringe on specified clearances. At no locations do these reduced clearances increase the risk of bushfire ignition.

Private property owners, National Parks and Wildlife Service, Snowy Hydro Limited and AEMO are being consulted in relation to the operating issues and risk mitigation strategies.

7. PUBLIC ELECTRICAL SAFETY AWARENESS

TransGrid's Public Electrical Safety Awareness Plan (PESAP) is based on a risk assessment of public safety issues with regard to TransGrid's assets. The PESAP is made available to all employees on TransGrid's Intranet "The Wire" and to the public via TransGrid's external website, as per Chapter 3 of the Network Management Plan 2011-2016.

The 2010/11 Action Plan for the implementation of the PESAP continued with the three specific focus areas from previous Plans: Relationship Management, Site Specific Issues and Community Interaction. Specific highlights for this year included:

- The preparation of a brochure relating to fire fighting activities in proximity to transmission lines. This brochure is to be provided to the Rural Fire Service, NSW State Forests and the National Parks and Wildlife Service as authorities who manage fuel loads in bushland areas near transmission lines.
- Preparation of risk assessments and reviews of line clearances in accordance with the requirements of NSW Maritime for crossings of navigable waterways.

The implementation of strategies is regularly reviewed by a working group of representatives from each Region and a report is provided to the Executive OHS Committee each year for review.

In addition to regular inspections by field staff, random audits are conducted on all TransGrid substations at least once every two years by the OHS Advisors to monitor safety conformance and identify any public safety issues. Identified issues are managed via reports to the relevant managers of the sites and recorded in the Issue Management System as appropriate.

8. POWER LINE CROSSINGS OF NAVIGABLE WATERWAYS

In accordance with Australian Standard AS 6947-2000, the crossings of navigable waterways by TransGrid infrastructure have been reviewed in conjunction with NSW Maritime and risk assessments prepared. As a result of this review, the number of crossings of navigable waterways requiring signage to address the residual risks has reduced from 236 to 41. The crossing list was reduced by re-assessing some waterways as not navigable at the crossing location, and by assessing the risks as negligible as the crossing height was more than 10m higher than the expected maximum vessel height provided by NSW Maritime.

In accordance with the NSW Maritime Power Line Crossings of Navigable Waterways Electricity Industry Code, the identified crossings will have existing signage replaced within the required timeframes. At the same time, crossings with existing non-compliant signage that were identified as not requiring signage due to significant crossing height will have the non-compliant signage removed.

Table 8.1 Bushfire Risk Management

	Existing (Number)	New (Number)	Incidents (Number)	Crossings Reconstructed (Number)	Crossings Identified as Requiring Conversion to Submarine Crossings (Number)
Overhead Crossings	41	0	0	0[1]	0
Submarine Crossings	0	0	0	0	0

Notes:

1. Two crossings of the Clarence River near Grafton have crossing heights that are below the expected maximum vessel height notified by NSW Maritime. These two crossings are by one 132 kV transmission line, either side of an island in the Clarence River. The vessel heights notified by NSW Maritime are considered by TransGrid to be excessive at 28m and 34m, and will be the subject of discussions between TransGrid and NSW Maritime prior to any plans to modify the power line crossing. It is not considered technically feasible to convert these crossings to submarine crossings due to the nature of the power system modifications for this work.

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