

## **PART I: THIS APPLICATION AND TRANSGRID'S BUSINESS**

Part I of this Application explains the purpose of the Application, the basis upon which it has been prepared, and its structure, as well as providing a general overview of TransGrid's business and the way the Commission interacts with TransGrid's business processes to produce transmission service – price outcomes.

There are two Chapters in this Part as follows:

- Chapter 1: Introduction.
- Chapter 2: Business Overview.

# 1 Introduction

TransGrid, based in New South Wales, is the largest Transmission Network Service Provider ("TNSP") in Australia. The organisation is a State Owned Corporation of the New South Wales Government with over 12,400 kilometers of High-voltage Transmission Line and 81 Substations and Switching Stations with a total asset value of approximately \$3 billion.

As a TNSP registered with the National Electricity Market Management Company ("NEMMCO") and operating in the National Electricity Market, TransGrid's Maximum Allowable Revenue for the provision of prescribed services under the National Electricity Code ("the Code") is determined by the Australian Competition and Consumer Commission ("Commission"). The Commission's first determination under this regulatory regime covered TransGrid's Maximum Allowable Revenue for the period from 1 July 1999 to 30 June 2004 and was issued on 25<sup>th</sup> January 2000. TransGrid was the first TNSP operating in the National Electricity Market to have its Maximum Allowable Revenue determined by the Commission and is the first to have its application reviewed for a second time.

## 1.1 Purpose of This Application

This Application's primary purpose is to assist the Commission in reaching an informed decision on the level of TransGrid's Maximum Allowable Revenue from July 2004 to June 2009. This level of Revenue needs to be prudent, as well as enabling TransGrid to meet its obligations, including obligations to customers, shareholders and other stakeholders.

In addition, for our customers and stakeholders, it provides an overview of TransGrid's performance over the last five years and outlines the vital link between the approach taken by the Commission in determining TransGrid's Maximum Allowable Revenue and transmission service outcomes into the next regulatory reset period and beyond.

## 1.2 Importance of This Application

The outcomes of this Application are vital to capturing the true potential of transmission in the National Electricity Market. This includes avoiding the mistakes made in other countries, and ensuring that TransGrid can continue meeting its service obligations, such as network reliability. The treatment of this Application also provides TransGrid, the Commission and other stakeholders, with an opportunity to address or accommodate some of the key uncertainties that currently cloud the economic regulation of Australian transmission. Examples of these uncertainties include:

- The unsettled nature of the Commission's Draft Statement of Regulatory Principles and the application of the Draft Statement of Regulatory Principles, in practice, to asset valuation, setting rates of return on regulated investment, and implementing effective performance incentive arrangements.
- The details of the new regulatory arrangements proposed by the Ministerial Council of Energy.
- The form, nature, and role of the Commission's 'regulatory test' in facilitating efficient network augmentation and the extent to which investments are eligible for inclusion in the regulated asset base.

These uncertainties remain despite the pressing need to commit to investment in assets with long development lead times and even longer economic lives.

### **1.2.1 Avoiding the Mistakes Made In Other Countries**

The pivotal role of transmission in ensuring reliability of electricity delivery and effective competition in deregulated electricity markets is now widely acknowledged.

The absence of adequate transmission capability was a significant factor in the Californian power crisis. In addition, the failure of transmission development to keep pace with needs over a long period of time is a major focus of the US Federal Energy Regulatory Commission's ("FERC") current proposed market reforms. The recent widespread North American blackouts are a timely reminder of the vital role played by transmission in delivering secure and reliable interconnected power systems. The recent transmission related supply failure in London also highlights the serious impact of even relatively minor electricity supply problems.

In Auckland, New Zealand, in February 1998, power was interrupted to the city through the failure of four underground supply cables. Power was not restored for some 52 days, and cost the network service provider NZ\$128 million in rectification of lines as well as more than NZ\$10 million in legal action.

New Zealand is also experiencing broader problems with its electricity arrangements. While these are related, in part, to water shortages and concerns about increasing dependence on overseas energy sources, the transmission grid is also of increasing concern. For many years the development of transmission to relieve constraints on market trading has been 'left to the market'. As a result the cheapest generation sources are not always able to reach customers adding to the total price paid for electricity.

It is vital to both electricity users, and the wider economy, that overseas failures to deliver the full value of a strong and reliable transmission network are not repeated in the Australian context.

### **1.2.2 Regulation and Transmission Play a Key Roles in the NEM**

In Australia, the Parer Energy Market Review Panel and, more recently, NEMMCO's Statement of Opportunities for the National Electricity Market, have echoed industry concerns that time is running out for the electricity sector. Load is growing steadily in all States, and significant investment is required in all elements of the electricity supply chain.

The Parer Report has also highlighted the critical role of transmission in the development of a truly national energy market and the importance of regulatory arrangements that will encourage the efficient operation and development of transmission services. In response, the Ministerial Council of Energy has singled out regulation as a key focus area for reform. However, consensus on the need for, and direction of, transmission reform was proving more elusive at the time of drafting this Application.

Some serious questions have also emerged about the way regulators are implementing economic regulation. Such questions have been raised in the Productivity Commission's Report on its Inquiry into the National Access Regime, the thrust of which has been endorsed by the Commonwealth Government in its interim response, as well as the Western Australian Supreme Court decision on Epic Energy's appeal against the WA Gas Access Regulator's draft determination on the Dampier to Bunbury Natural Gas Pipeline.

The common theme of these recent developments relate to the impact that regulatory decisions are having on the incentive to invest and improve efficiency. Specifically, the Productivity Commission has noted that economic regulation is currently being applied in a way that is intrusive and creates a higher than necessary degree of regulatory risk. Concerns were also raised that an inappropriate balance currently exists between eliminating perceived monopoly rents, and providing incentives for efficiency improvement and investment.

### 1.2.3 TransGrid's Approach

During the current regulatory period (1999/2004) TransGrid has focussed on meeting its responsibilities as efficiently as possible, despite the uncertainties it faces regarding the future regulation of its decisions. As a result, the considerable benefits of the Queensland/New South Wales Interconnector (lower energy and ancillary service prices), MetroGrid (network reliability to the Sydney CBD) and other projects have been, or will be, delivered in a timely fashion. The assets managed by TransGrid remain in good condition and continue to deliver safe, reliable and environmentally responsible outcomes.

Looking ahead, TransGrid has identified significant benefits in continuing to develop transmission capability and is seeking reassurance that efficient operations and investment will be recognised and rewarded by the regulatory regime.

TransGrid recognises that, as a regulated business, it will be required to demonstrate the prudence and efficiency of its actions and will provide all reasonable assistance to the Commission and its advisers in their evaluation of this Application. TransGrid has acted in good faith and is asking the Commission to respect the integrity of TransGrid's position and to take a responsible approach in assessing this Application. In this regard, the Code and the Draft Statement of Regulatory Principles provide key reference points.

Where there is a lack of clarity in the Code requirements, or where changes to the Regulatory Principles are considered essential, a prime objective should be to ensure that Australia can capture the full potential of its transmission infrastructure in the short, medium, and long term. This can only occur if the right balance is struck between the need to:

- Undertake significant new investment required to meet service obligations including continuing growth in the demand for transmission services.
- Deliver and finance investment at a reasonable cost.
- Ensure that the performance of existing assets is maintained over time.
- Maintain incentives to deliver these outcomes efficiently, having proper regard for non-network options such as demand side management.
- Respect the interests of electricity customers who are entitled to value for money – customers are concerned about the total price paid for electricity and the level of overall service, including high levels of ongoing supply reliability.
- Preserve the legitimate commercial entitlements of shareholders in transmission businesses over time.

TransGrid has met its responsibilities with the expectation that the Commission recognises and agrees with the need to maintain this vital balance.

## 1.3 How This Application Has Been Prepared

This Application has been prepared to meet the requirements of the Code in relation to the regulation of transmission revenues and the principles outlined in the Draft Statement of Regulatory Principles.

The Draft Statement of Regulatory Principles indicates to interested parties the Commission's position on the issues to be addressed in the regulatory process. Attachment 1 and Attachment 2 to this Application contains further information on the specific provisions in the Code and in the Principles.

This Application is formulated around the inputs required by the Commission's preferred 'building block' model known as the Post-Tax Revenue Model. This will assist the Commission in determining the Maximum Allowable Revenue for TransGrid's prescribed services<sup>1</sup>.

Under the Post-Tax Revenue Model, TransGrid's annual revenue cap will be determined as the aggregate of four cost-based building blocks:

- Operating and maintenance expenditure required to be carried out by TransGrid.
- Return of capital, which reflects the economic depreciation (or change) of the value of the regulatory asset base from one year to the next.
- Return on capital, which is based upon a rate of return that is applied to the value of TransGrid's regulatory asset base each year, which in turn, requires information on TransGrid's proposed capital expenditure plans.
- The cost of tax, which reflects the amount of corporate tax payable by TransGrid on its taxable earnings each year.

In determining TransGrid's revenue cap, the Commission has regard to, among other things, the appropriateness of the forecasts for the underlying building blocks, including capital expenditure requirements.

The assessment process requires the Commission to form a view on whether regulated investments made by TransGrid in the network are needed to meet service obligations and that the most efficient option for meeting those service obligations has been adopted. In essence, Chapter 5 of the Code provides a network development process that, if followed by TNSPs, is designed to deliver this outcome. At the heart of this process is the requirement for TNSPs to be transparent in their decision-making and to utilise the 'regulatory test' to compare the relative efficiency of major service improvement investments, including non-network options. This Application outlines TransGrid's approach to implementing this process.

In setting the revenue cap, the Code also requires the Commission to have regard to the service standards referred to in the Code that are applicable to the TNSP and any other obligations imposed upon the TNSP by legal instrument or by agreement with relevant customers. These obligations are also detailed in this Application. In addition, processes are proposed for adjusting the Maximum Allowable Revenue during the reset period to accommodate changes in obligations as they arise.

However, the uncertainties associated with being the first TNSP to undergo a second review of its Revenue Cap application cannot be underestimated. During its first Revenue Cap review, TransGrid was required to develop its Revenue Cap submission with no initial guidance and modify its submission during the Commission's review process following the issue of the initial Draft Statement of Regulatory Principles. As a result, some outcomes of the Commission's determination have proven not to be robust and have been followed by modifications in later TNSP Revenue Cap determinations.

TransGrid is now submitting its second Revenue Cap Application at a time when the Commission has issued a Discussion Paper aimed at reviewing the Draft Statement of Regulatory Principles. As such it will be critical for TransGrid to work closely with the Commission to ensure that suitable outcomes are achieved, which will become the standard for future reviews of TNSP submissions.

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<sup>1</sup> **Prescribed services** are transmission services provided by transmission network assets or associated connection assets that are determined by the regulator as not being contestable.

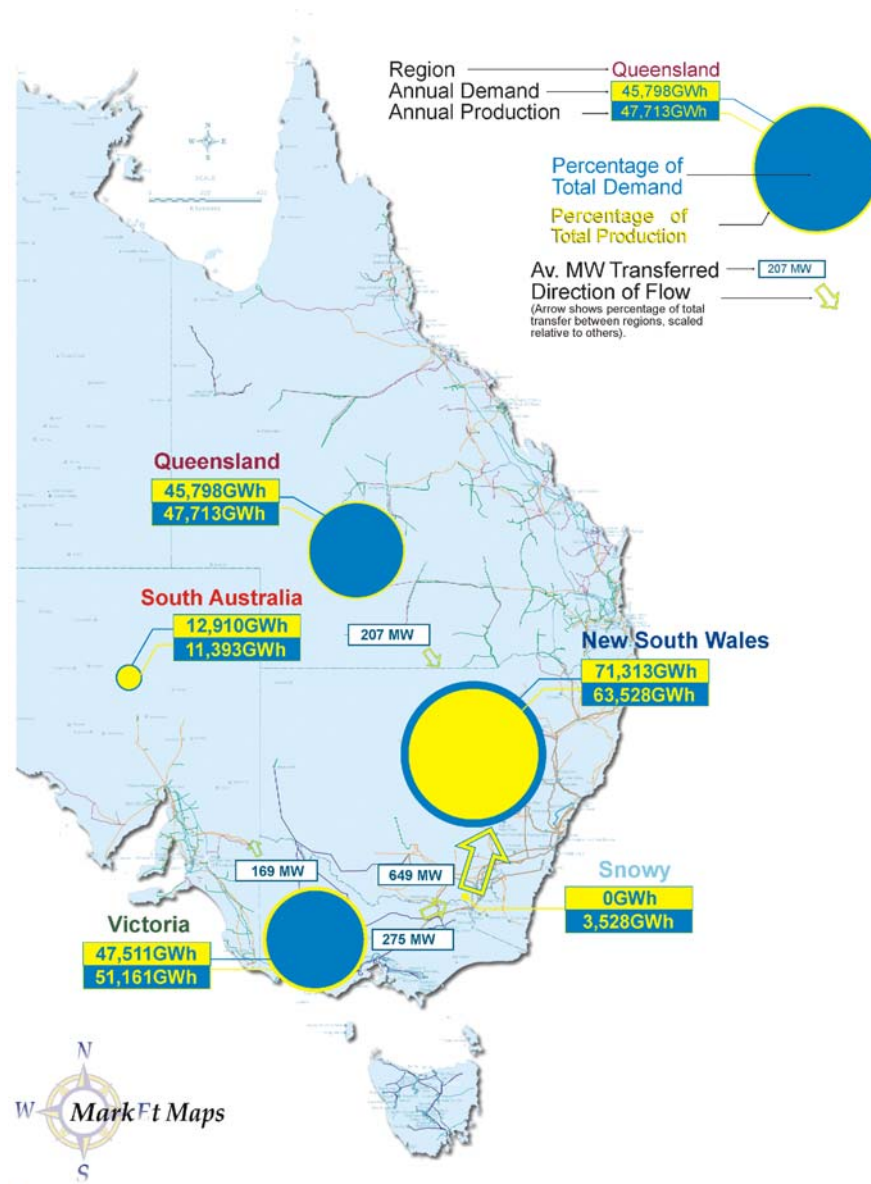
## 2 Business Overview

TransGrid is a NSW state-owned corporation. It is responsible for providing electricity transmission services within NSW and across the wider NEM.

These services involve the transmission of electricity in response to market demands:

- From generator connection points to distribution network connection points and the direct connection points of a number of large end-users. There are currently 48 generator connection points, most of which are located in Western NSW, the Central Coast and the Hunter Valley. There are also 325 distributor and direct customer connection points that mirror the dispersion of the electricity end users around the State.
- Between the NSW and Snowy regions of the NEM, and between these regions and the Queensland and Victorian regions.

**Figure 2-1: Supply and Demand in the NEM Regions (2002 Calendar Year)**



Transmission networks are regarded as the “backbone” of the electricity system, essential for the delivery of competitively priced electricity from generators to electricity consumers. This characteristic, and the central position of TransGrid’s network in the NEM between other major regions (refer Figure 2-1), highlights the unique position of TransGrid’s network within the interconnected grid system that extends along the eastern seaboard of Australia.

Over 3 million electricity customers, including households and businesses in Australia’s most populous State and largest capital city, rely upon the energy transmission services provided by TransGrid. As shown in Figure 2-1, the vast majority of energy delivered via TransGrid’s network is used in NSW and the ACT. Retailers, generators and network service providers in the ACT, Queensland, Victorian and South Australian regions also rely upon TransGrid’s network to facilitate the flow of energy from regions with excess supply to those with excess demand.

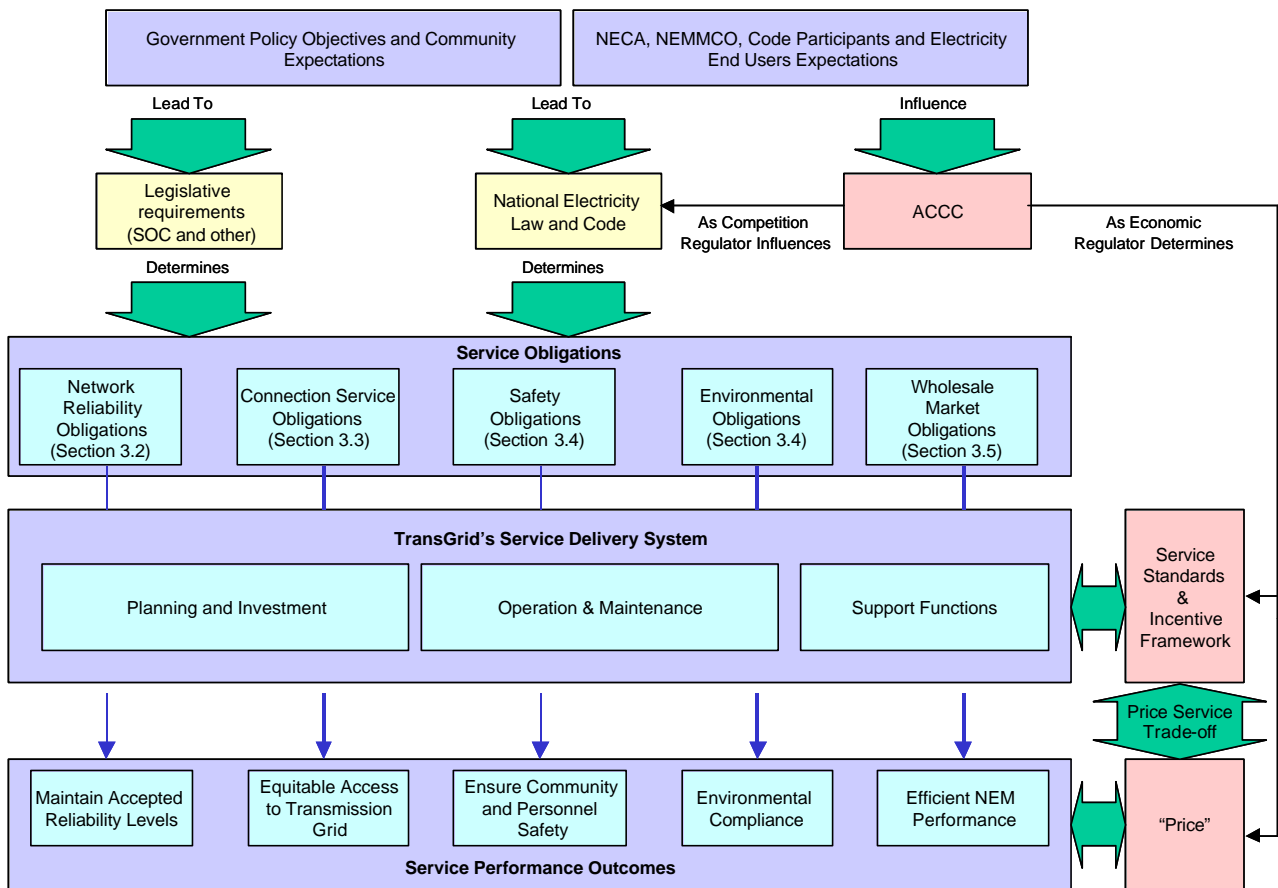
## 2.1 The Transmission Service Delivery Process

TransGrid’s transmission service delivery process may be summarised in terms of Figure 2-2 below. This diagram illustrates:

- The relationship between the service expectations that stakeholders and customers have of TransGrid’s business and TransGrid’s formal service obligations.
- TransGrid’s major service obligation areas of network reliability, connection services, safety, environment, and the wholesale electricity market.
- The key components of TransGrid’s Service Delivery System, including planning and investment, operation and maintenance, and support functions, that work together to translate service objectives into service outcomes.
- The pivotal role of the transmission regulatory regime, overseen by the Commission, in ensuring that TransGrid’s service obligations can be met, that there are appropriate commercial incentives for the business to perform efficiently and responsively, and that revenue caps provide reasonable risk adjusted returns to the business rather than ‘monopoly rents’.

This framework provides a useful point of reference for TransGrid’s formal service obligations, as set out in the Energy Services Corporations Act, regulations under the Electricity Supply Act and the Code. These service obligations are discussed in detail in Chapter 3. In particular, it highlights the gap between the services the stakeholders expect TransGrid to deliver; compared with the services that TransGrid is formally obliged to deliver. This distinction is important because TransGrid’s MAR is necessarily framed in terms of its formal service obligations.

**Figure 2-2: Framework for Business Operations and Service Delivery**



**2.2 Customer and Stakeholder Expectations**

TransGrid’s regulated customers are those parties from whom TransGrid receives Transmission Use of System (“TUOS”) payments for prescribed services and connection charges. Under this definition TransGrid’s regulated customers include:

- Energy Australia, Integral Energy, Country Energy and Australian Inland Energy and Water - the four electricity distribution network service providers in NSW who rely upon TransGrid’s network services to enable them to deliver electricity to end users;
- large electricity users directly connected to TransGrid’s high voltage transmission network;
- generators connected to TransGrid’s network; and
- interconnected transmission network service providers within NSW, Victoria, Queensland and the ACT.

TransGrid’s stakeholders are those parties reliant on TransGrid delivering its services in a manner consistent with standards set out for it through regulatory instruments on their behalf (as amended, where appropriate, by individual connection agreements). Its key stakeholders



therefore include the customer groups listed above as well as other Code Participants, electricity end users, energy traders, the businesses and residents of NSW, the NEM Governments (particularly the NSW Government), NEMMCO, NECA and the Commission.

Because of their position or role in the NEM, and their respective perceptions on the role of transmission, stakeholders have varying expectations of TransGrid's service performance. This reflects the 'common good' nature of transmission service requiring resolution of competing requirements to be formalised in a legal instrument such as legislation, regulations, the Code, Connection Agreement, and/or licensing requirement. Resolution of these varying expectations in this way also helps clarify TransGrid's business focus.

This has important implications for the revenue determination covered by this Application.

Firstly, the service requirements that need to be primarily considered when assessing this Application are those that have been formalised in a legal instrument rather than expectations that are articulated as part of the wider discussion on the role of transmission in the NEM.

Secondly, there needs to be a process for accommodating changes to formal service obligations as they occur during a regulatory reset period. In this way TNSPs can respond to changes without commercial penalty.

Finally, to the extent that there are no conflicting formal instruments covering a service obligation the Commission may be able to use a service incentive scheme linked to regulated revenues to encourage changes in service outcomes where it is confident that it has the legal authority and that the change is 'net beneficial'.

## 2.3 Service Obligations

TransGrid's statutory responsibilities as a state-owned corporation are principally derived from the State Owned Corporations Act and the Energy Services Corporations Act. TransGrid is also bound by the regulatory regime set out in the Code as it applies to TNSPs and to Regulations under the Electricity Supply Act dealing with network safety, management and reliability.

TransGrid's formal obligations are briefly outlined below and explained in more detail in Chapter 3 of this Application.

### 2.3.1 Statutory Obligations and Responsibilities

The Energy Services Corporations Act defines TransGrid's principal objectives as an energy transmission operator as follows:

- To operate efficient, safe and reliable transmission facilities.
- To contribute to regional development and decentralisation in NSW by ensuring that regional areas are adequately serviced.
- To operate as a commercial business, including to maximise the net worth of the State's investment in the business and to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates.
- To promote effective access to transmission facilities.
- To protect the environment and conduct its business in an ecologically sustainable manner.

Each of these objectives has equal ranking and importance. Attachment 3 to this Application contains an extract from the Energy Services Corporation Act.

In addition, regulations under the Electricity Supply Act impose certain obligations upon TransGrid to construct, operate, repair and maintain its electricity network with the aim of promoting the efficient, safe, reliable and environmentally responsible production and use of electricity.

### **2.3.2 Code Obligations**

TransGrid is also required to comply with the obligations imposed upon TNSPs under the Code. Some of the key TNSP obligations include:

- reviewing and processing applications to connect to the network and enter into connection agreements in accordance with the detailed requirements set out in the Code (clause 5.2.3(d) of the Code);
- ensuring transmission services meet the detailed network performance and reliability standards set out in the Code (clause 5.2.3(b) of the Code);
- in its capacity as a 'system operator' appointed by NEMMCO under clause 4.3.3 of the Code, operating the network to carry out the system security obligations delegated to it by NEMMCO in accordance with the Code; and
- undertaking annual network planning to analyse the expected future operation of its transmission network over a ten-year planning period and to determine the need for network augmentation (clause 5.6.2 of the Code).

### **2.3.3 Key Service Areas**

For business management purposes it is helpful to group TransGrid's Statutory and Code obligations into five key service areas as follows:

- Network reliability – this includes TransGrid's obligations to its customers and to its stakeholders to provide the appropriate levels of network reliability.
- Connection service – this includes TransGrid's obligations, primarily to customers and prospective customers (e.g. generators, distributors and large end users) to provide effective, timely and efficient connection services.
- Safety – this includes TransGrid's obligations, primarily to its stakeholders (e.g. staff, other electricity industry employees and the NSW community) to deliver its services with appropriate priority given to human safety.
- Environmental – this includes TransGrid's obligations, primarily to its stakeholders (e.g. the NSW community and government) to deliver services in an environmentally responsible manner.
- Wholesale Electricity Market – this includes TransGrid's obligations in relation to the operation and development of the NEM within NSW and the ACT, as well as across interconnected regions.

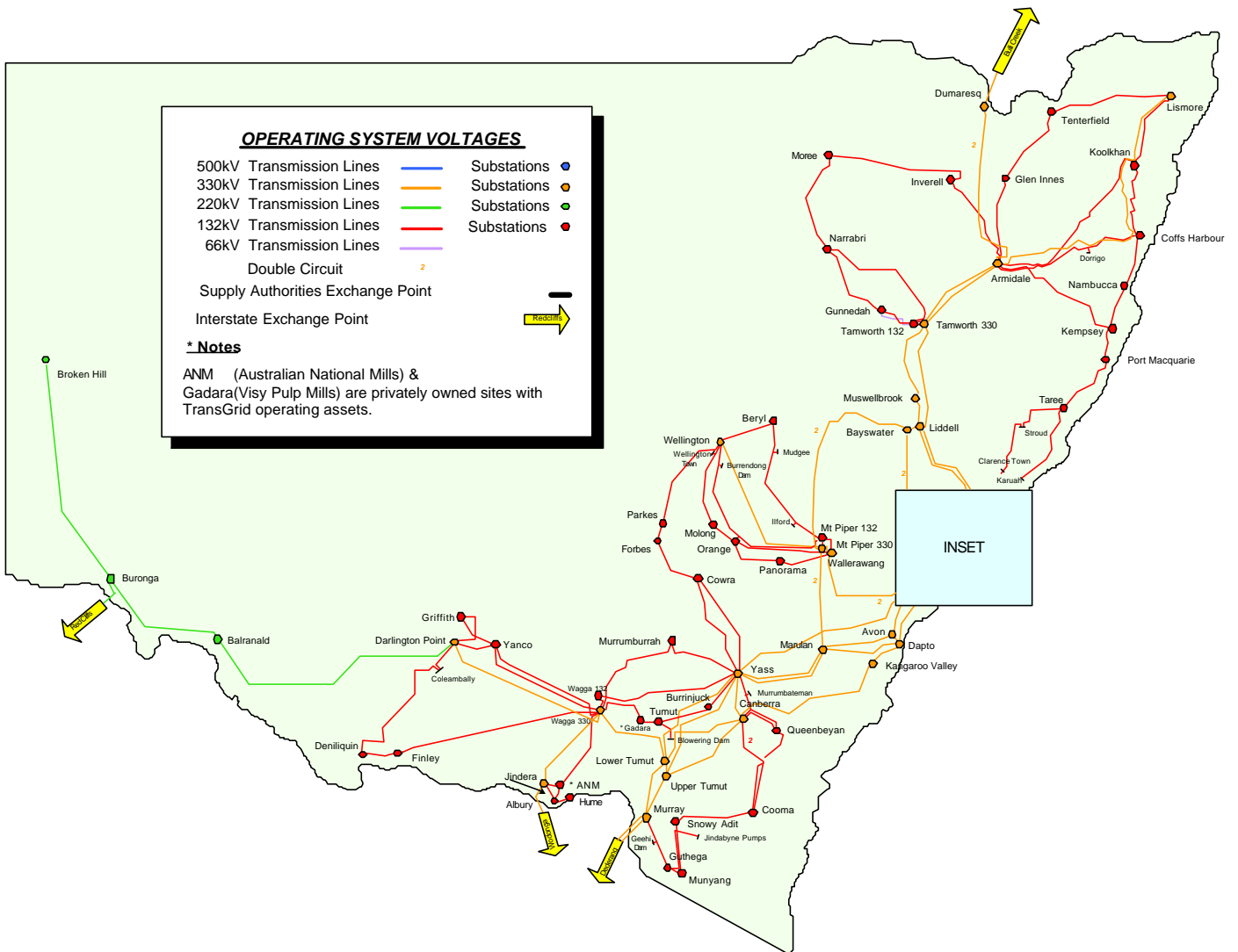
Each of these is discussed further in Chapter 3 of this Application.

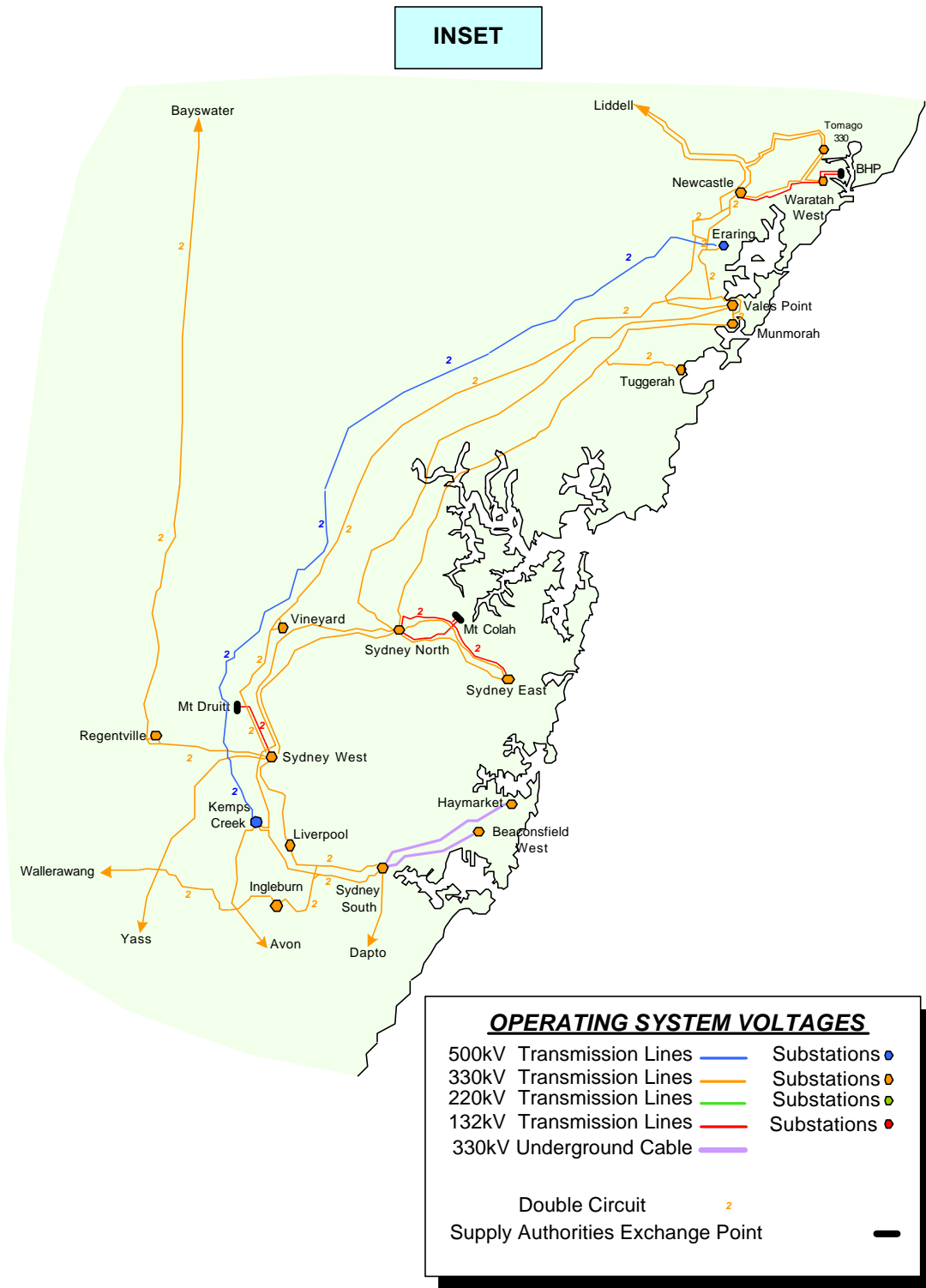
## 2.4 TransGrid's Service Delivery System

### 2.4.1 Network Description

TransGrid's network is comprised of over 12,400 km of transmission lines operating at voltages up to 500kV and 81 substations. It spans an area that extends from the Queensland to Victorian borders and 400km inland from the east coast with extension along the Murray River and up to Broken Hill. The coverage of TransGrid's network is set out in figure 2-3 below.

Figure 2-3: Coverage of TransGrid's Network





**2.4.2 Supporting the Service Delivery System**

TransGrid's network is its primary vehicle for delivering its service performance outcomes. In addition, because of its geographical position within the NEM, TransGrid's network plays a pivotal role in facilitating energy through-flows across the NEM regions.

To ensure that the network can efficiently perform these functions, TransGrid must plan, develop, operate and maintain its transmission network appropriately to sustain appropriate

levels of transmission capability. Schedule 5.1 of the Code sets out the planning, design and operating criteria that TNSPs should apply to meet their service delivery objectives.

As with any business, the success of these activities and the overall service delivery system also depends critically on the functions that support planning and investment, and operation and maintenance processes.

These support functions typically include management of business resources such as staffing and information systems, as well as effective financial and management accounting functions.

The remainder of this section briefly describes each area of TransGrid's service delivery system. It also explains aspects of transmission service delivery that are influenced by factors outside of TransGrid's service delivery system. This has important implications for TransGrid's accountability and the development and application of an appropriate service incentive framework.

### **2.4.3 Planning and Investment**

Network planning and investment are key activities undertaken by TransGrid to support service delivery, particularly as the demand for network capability changes over time. The long lead times involved in delivering transmission developments make planning a vital component of an effective transmission service delivery system.

Planning includes connection planning, network planning for the NSW regional network, and inter-regional planning. In each case planning needs to be co-ordinated closely with other parties to ensure that the most efficient development option is identified, including demand side or embedded generation alternatives. In 2002 for example, TransGrid, in association with Energy Australia and the Department of Urban and Transport Planning, initiated a high priority project to implement a Demand Management Strategy to defer or avoid network expansion in the inner metropolitan Sydney area.

Connection planning may involve a major end user, generator, or distributor. Network planning for the NSW regional network primarily involves joint planning with distribution network businesses. Inter-regional planning primarily involves co-ordination with another TNSP, but may also involve distribution businesses in one or both of the regions concerned.

The need for, and timing of, network development is established by assessing the capability of the network against a range of possible future scenarios. These scenarios may include possible future wholesale market arrangements when assessing main transmission network requirements. Alternatively, scenarios may only need to include different load growth outcomes when planning relates to more localised networks.

One of the key outputs of the planning process is information on the nature and location of current and emerging constraints in the network caused by load growth and generation developments. Findings, together with development options, are documented publicly in the form of an Annual Planning Report. A copy of TransGrid's NSW Annual Planning Report for 2003 is included in Attachment 4. A more detailed discussion of TransGrid's planning process is contained in Chapter 5 of this Application.

Development of the network also requires investment to be undertaken to convert plans into augmentations. Developing transmission networks is quite challenging and requires perseverance and motivation to steer projects through regulatory and environmental approval processes. Both processes involve extensive stakeholder consultation and are essential to ensure that best result for the wider community. They also provide transparency of decision-making and assist in ensuring that the most efficient options are adopted, including non-network options. Failure to adhere to these processes can result in the 'writing down' of associated capital expenditure for revenue setting purposes by the ACCC.

Investment involves the raising of capital with the potential returns to the investor providing an important incentive to persevere in taking options through these processes. It also provides the incentive to ultimately complete the resulting project. TransGrid achieves this through competitive procurement of virtually all its capital works and has an extensive infrastructure to ensure clear specification of needs and disciplined management of contracts.

#### **2.4.4 Operation and Maintenance**

The successful delivery of service outcomes also depends on the way in which existing assets are operated and maintained. Comprehensive asset management processes are employed to ensure timely and efficient maintenance, refurbishment and/or replacement of assets. This ensures that assets continue to operate at the performance for which they were designed and deliver the plant capacity levels assumed in the network planning process.

Further information on TransGrid's asset management process is contained in Chapter 5 of this Application and TransGrid's Network Management Plan in Attachment 5 to this Application.

#### **2.4.5 Support Functions**

Business support functions can play a pivotal role in the capability of a business to deliver efficient and complete services. The importance of staffing strategies, information systems, accounting systems, and other support services that interact to enhance core business processes is generally well recognised.

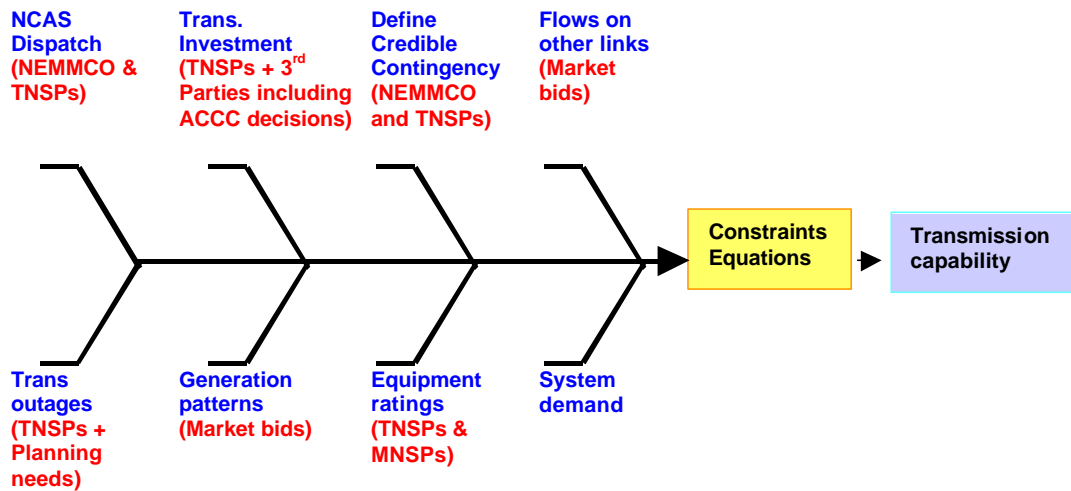
Within a transmission business there are support functions that can make a unique and valuable contribution to service outcomes that are unique to that type of business. These include the capability to interpret and model power system behaviour, forecast changing network conditions, recognise and respond to changing service obligations, undertake effective community consultation processes on proposed developments, and manage the delivery of complex engineering projects on a contestable basis.

By way of example, the ability to interpret and model power system behaviour can lead to significant improvements in the representation of transmission limits in NEMMCO's market dispatch engine and deliver additional transmission capability with minimal additional capital expenditure. This example is discussed further in the next section.

#### **2.4.6 Some Key Service Outcomes are Outside TransGrid's Control**

Transmission capability relates to the capacity of the network to transport power from one point in the network to another. This is an important consideration in meeting network reliability and wholesale market obligations. TransGrid has control over some, but not all, of the factors that determine this capability through its service delivery system, including influence over investment, operation and maintenance decisions as these decisions relate to TransGrid's network.

Figure 2-4 includes a more comprehensive description of the factors that affect transmission capability, and, by implication, transmission service outcomes, particularly in relation to wholesale market impacts.

**Figure 2-4: Factors Affecting Transmission Capability**

Broadly, network capability between any two points can depend on a range of variables and their interaction with the constraint equations used within NEMMCO's market dispatch engine. These variables include:

- The availability and dispatch of network control ancillary services ("NCAS"), some of which are procured by NEMMCO from generators and some of which are delivered by TNSPs.
- Generation dispatch patterns resulting from market driven bidding behaviour.
- Patterns of customer demand at the various "take off" points from the transmission network.
- The nature of contingencies considered as being 'credible'. Credible contingencies are events the occurrence of which NEMMCO considers being reasonably possible under the prevailing conditions at the time (e.g. the unexpected disconnection of a transmission line).
- Outages of transmission network elements and the timing of these outages.

Some of these variables, such as generation bids, change in relatively short time frames during which the constraint equations themselves do not change. Under these circumstances, in the short term, transmission capability is essentially outside of TransGrid's control.

The flow patterns that can be accommodated by TransGrid's existing network are essentially determined by the existing network topology. Historically, this topology reflects the needs of past, more predictable, flow patterns associated with a centrally operated and planned power authority.

The flow patterns driven by market conditions (generator bids and increased variation in interconnector flows) are far more dynamic and demanding of this topology than in the past and result in new network constraints, even when there are no transmission outages.

By way of example, Table 2-1 below shows that, even though power flows between the regions are, on average, relatively small, they can vary over a quite large range. The capability of the network can only be improved to meet all possible market conditions with additional investment that changes network topology.

**Table 2-1: Inter-Regional Flow Information for 2002/03**

	Average Flow (MW)		Range of Flows (MW)	
Queensland to NSW	286 to NSW	1,106 to NSW	546 to Queensland	
Snowy to NSW	742 to NSW	3,217 to NSW	452 to Snowy	
Victoria to Snowy	233 to Snowy	1,250 to Snowy	1,746 to Victoria	
Victoria to SA	262 to SA	700 to SA	346 to Victoria	

Other variables, such as a planned transmission outage, lead to new constraint equations being applied by NEMMCO in the dispatch engine during the period of the outage. In this case, the representation of the outage within the constraint equations, and the transmission capability that results, is largely determined by NEMMCO's assessment of the system security implications. While TransGrid may have some control over the timing of an outage, it has far less control over the resulting impact on transmission capability.

The commissioning of a new transmission augmentation, leads to a more permanent change in the constraint equations used by NEMMCO in its dispatch engine, and hence a more lasting change in transmission capability. While it is usually TransGrid that proposes the form of the new constraint equations, it is ultimately NEMMCO's responsibility to ensure that the equation is consistent with the need to maintain the system in a secure state. That is, NEMMCO may choose to alter the effective transmission capability from that anticipated at the time of the investment. While, in practice, both organisations work closely together on such important decisions, the fact remains that TransGrid does not have complete control over this aspect of service delivery.

There are also 'force majeure' events that impact on transmission capability. While transmission networks are managed to accommodate a range of events it is not economic to cover every eventuality. This could include exceptional weather conditions, widespread bushfires, and sabotage. Such occurrences can, and sometimes do, result in material periods of reduced transmission capability.

Indeed, the Commission itself has a significant influence on the ability to change transmission capability via new transmission investment. The decisions it makes in relation to regulated returns, or the incorporation of investments into an asset base for revenue setting purposes, affect the incentives of TNSPs to seek out new network development opportunities. In addition, the form and scope of the regulatory test affects the range of projects that will ultimately prove acceptable.

In summary, while TransGrid is responsible for operating and managing its transmission network on a day-to-day basis, TransGrid's service delivery system cannot, of itself, determine and control all transmission service outcomes.

This is a key consideration in designing regulatory incentives to encourage TNSPs to maximise short-term transmission network operating capability and the certainty of that capability, which is discussed further in Chapter 7. However, with the correct regulatory incentives driving innovation and creativity, TransGrid can make a valuable contribution to transmission service in the NEM. This is also explored further in Chapters 6 and 7.



## 2.5 Regulatory Approach and Service Outcomes

As highlighted in Figure 2-1, the level of revenue allowed by the Commission, the nature of incentives provided, and the degree of flexibility in the revenue arrangements, have a direct impact on TransGrid's ability and commercial motivation to efficiently meet its service obligations to customers and stakeholders.

To the extent that TransGrid is obliged to provide services regardless of income, then failure to provide adequate levels of revenue is inconsistent with the Code objective of providing reasonable risk adjusted returns to shareholders. Indeed, such a regime must be regarded as punitive - in TransGrid's case, to the taxpayer of NSW.

To the extent that a service may be discretionary, the incentives provided by the Commission in its revenue setting arrangements can determine whether or not a service is delivered. For example, transmission companies are not obliged to pursue development options that improve interconnection capacity unless it is part of meeting a network reliability obligation. However, returns on investment in efficient developments that exceed the weighted cost of capital provide a clear incentive to seek out and deliver such development options.

The Productivity Commission, in its recent inquiry into the national access regime, observed that given the scale and strategic position of infrastructure facilities in the service delivery chain, it was important to ensure that incentives to invest in such facilities are preserved. It was noted that regulators faced a major challenge in setting prices for regulated services due to the imperfect tools available for such analysis, and that adverse consequences could flow from setting prices too high or too low.

The Productivity Commission concluded, however, that setting prices too low posed a greater risk for the community because it creates disincentives to invest in both new and replacement facilities. The danger in this is that given the long-lived nature of most essential infrastructure, the impact of such disincentives may not manifest for a long time. It was in this context that the Productivity Commission placed strong emphasis on the need to create a regulatory regime that is conducive to efficient investment as being a key priority.

Incentives can also play a vital role in achieving improved operational efficiency, but only if they are related to factors within the control of a TNSP, and only if they are applied consistently over time. Where these incentives are asymmetric in favour of penalties over rewards, again, a punitive regime results.

TransGrid's network also holds a strategically significant geographical position in the NEM. Ensuring that appropriate incentives exist for TransGrid to develop its network to accommodate the changing pattern of energy flows between the NEM regions, and respond to market conditions, is vital to achieving efficient wholesale market outcomes.

Some flexibility in revenue setting arrangements within defined bounds can also be important. For example, it would be unreasonable if changes in service obligations occurred during a reset period that increased TransGrid's costs without a commensurate adjustment in revenue cap being made. This situation also provides TransGrid with an incentive to oppose changes to the Code, or other legal instruments, even if the change is in the wider public interest, and is being sought by stakeholders.

In summary, the adequacy of the MAR, and flexibility it allows, will determine the extent to which TransGrid:

- can continue to meet its service obligations to customers, including appropriate levels of network reliability in light of continuing growth in customer demand for electricity;
- can continue to meet its wider responsibilities to the community including its environmental and safety responsibilities;

- can continue to meet its obligations to National Electricity Code Participants as set out in the National Electricity Market legal framework;
- has effective incentives to improve services and the efficiency of service provision in ways that maximise the value of those services to customers and the wider community; and
- is able to respond appropriately to changing service expectations.