TransGrid

Approach to forecasting

2014/15 - 2018/19

Contents

1.

Introduction

2.

Operating Expenditure

3.

Capital Expenditure

1 Introduction

TransGrid's approach to forecasting expenditure for the 2014/15 to 2018/19 revenue proposal is presented in this document.

TransGrid is the major electricity transmission network service provider in New South Wales and the Australian Capital Territory.

TransGrid is aware that an affordable supply of electricity is important to electricity consumers. It has worked hard to ensure that the forecasts in its revenue proposal are efficient, prudent and in the long term interests of consumers.

The approach to developing TransGrid's plans ensures that the expenditure forecasts are responsive to its changing operating context. The plans reflect the most current forecasts in demand and market scenarios, and the planning process has been refined to ensure that necessary infrastructure is available when needed but can be prudently deferred or cancelled in response to changing drivers.

TransGrid will submit a transitional revenue proposal in January 2014 to establish a 'placeholder' revenue for the 2014/15 year, followed by a full revenue proposal in May 2014 that proposes revenue for the full 2014/15 to 2018/19 period. The difference in revenue between the transitional and full determinations will be adjusted in the full revenue determination.

The approach to forecasting set out in this document is being used to forecast capital and operating expenditure in the full revenue proposal. It has also been used to prepare the indicative expenditure forecasts for the transitional revenue proposal. Some differences in forecasts between the transitional proposal and the final full revenue proposal should be expected, largely due to the passage of time and as new information becomes available.

1.1 Background

In the *Economic Regulation of Network Service Providers* rule change, the AEMC reviewed and amended the revenue determination process. The amended process includes formal engagement between a network service provider and the AER ahead of the submission of a revenue proposal.

During this early formal engagement, the network service provider is required to inform the AER of its proposed approach to forecasting operating expenditure and capital expenditure.[1] The AER is required to publish a framework and approach paper setting out

[1] *National Electricity Rules*, Rule 6A.10.1B.

its approach to a number of matters including the assessment of expenditure forecasts.[2] The AEMC's intention is that a key benefit of early engagement is a reduction in time and effort once the regulatory process has commenced.[3]

1.2 Scope

This document sets out TransGrid's approach to forecasting operating expenditure and capital expenditure in the revenue proposal. It includes a description of the models, methodologies, inputs and assumptions that comprise the approach.

[2] *National Electricity Rules*, Rule 6A.10.1A.
[3] AEMC, *Final Position Paper: National Electricity Amendment (Economic Regulation of Network Service Providcers) Rule 2012*, 15 November 2012, p88.

2 Operating Expenditure

Operating expenditure is the ongoing expenditure required to provide transmission services. This includes planning the network, managing assets, 24 hour monitoring and operation of the network, maintenance and business activities.

Most operating expenditure is recurrent expenditure that is incurred year on year. However, some categories of operating expenditure can vary from year to year. TransGrid's forecasting approach provides for both patterns of expenditure.

This chapter describes TransGrid's approach to forecasting operating expenditure.

2.1 National Electricity Rules

The National Electricity Rules set out the operating expenditure objectives to be achieved by forecast operating expenditure.

The operating expenditure objectives are to:

1. Meet or manage the expected demand for prescribed transmission services over that period
2. Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services
3. To the extent that there is no applicable regulatory obligation or requirement in relation to:
   (i) the quality, reliability or security of supply of prescribed transmission services; or
   (ii) the reliability or security of the transmission system through the supply of prescribed transmission services,

   to the relevant extent:
   (iii) maintain the quality, reliability and security of supply of prescribed transmission services; and
   (iv) maintain the reliability and security of the transmission system through the supply of prescribed transmission services
4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[4]

The applicable regulatory obligations in relation to the quality, reliability and security of supply that apply to TransGrid are set out in the *Transmission Network Design and Reliability Standard for NSW* published by NSW Trade & Investment.

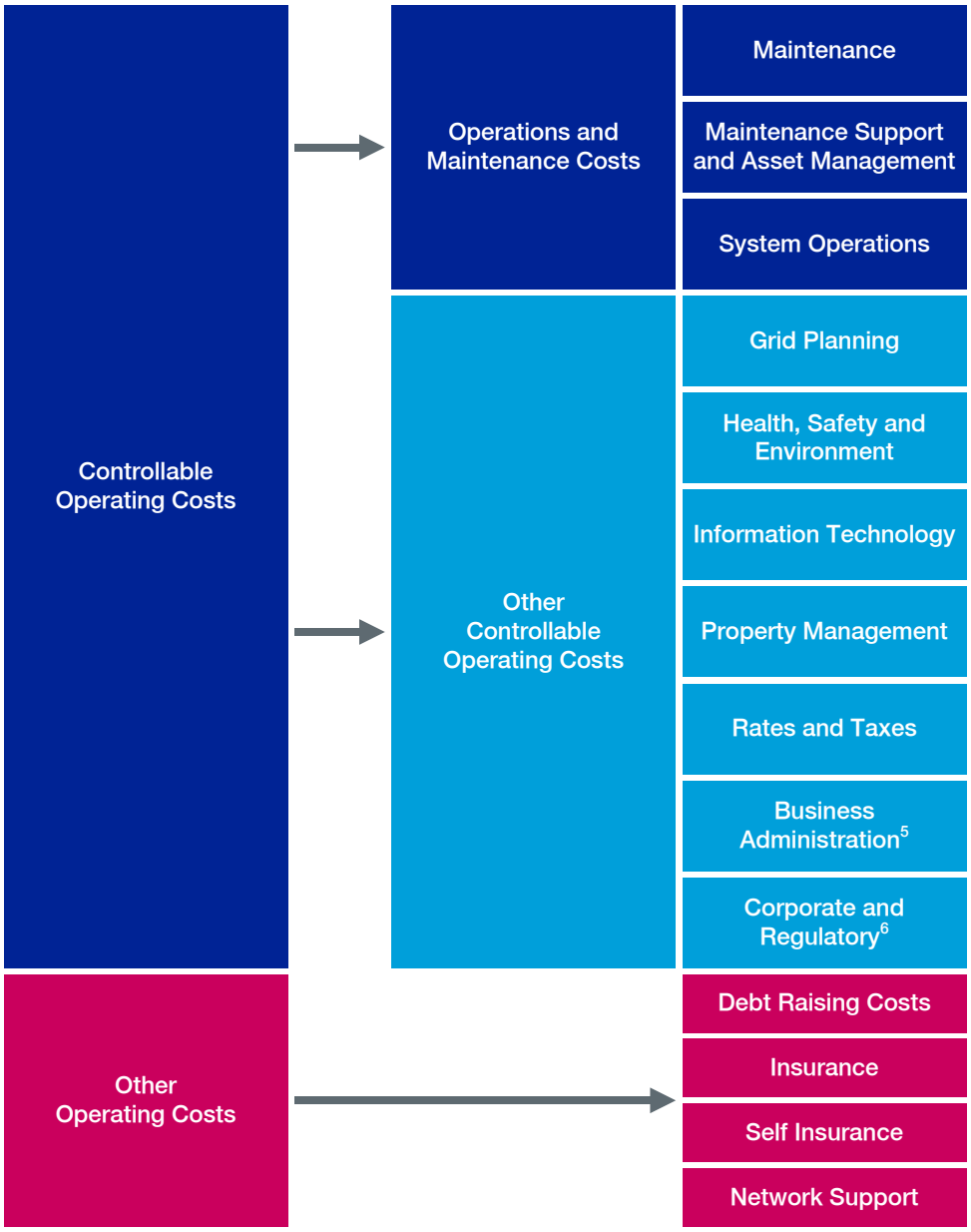
[4] *National Electricity Rules*, Rule 6A.6.6(a).

TransGrid's approach to forecasting operating expenditure has been developed to uphold the operating expenditure objectives and applicable regulatory obligations. It seeks to efficiently meet TransGrid's obligations in regard to the price, quality, safety, reliability and security of the transmission network.

2.2 Operating Expenditure Categories

The categories of operating expenditure are shown in Figure 2.1.

Figure 2.1
Operating Expenditure Categories



[5] The Business Administration category includes the finance, human resources and payroll activities.
[6] The Corporate & Regulatory Management category includes activities such as legal, audit, customer relations and revenue reset.

2.3 Operating Expenditure Methodology

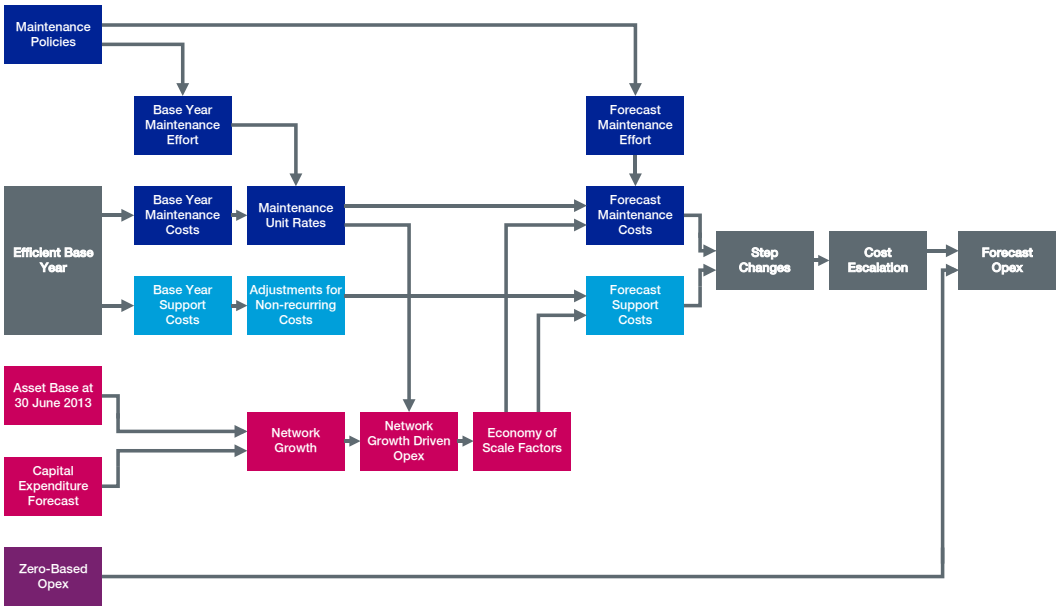
TransGrid uses an operating expenditure model to forecast expenditure.

The model predominantly uses a base – step – trend approach to forecasting operating expenditure, particularly where historical expenditure provides a realistic expectation of forecast expenditure. This approach is most commonly suited to expenditure which is recurrent in nature. A variation on the approach is used for maintenance work.

For a small number of categories of expenditure, forecasts are zero based. This approach is used for categories that comprise specific projects or where market rates provide the best expectation of forecast expenditure.

The operating expenditure forecasting methodology is shown in Figure 2.2.

Figure 2.2
Operating Expenditure Methodology



The application of the methodology to the operating expenditure categories is as follows.

2.3.1 Maintenance Activities

The types of activities involved in maintenance of the transmission network include:

- preventative maintenance and inspections;
- condition based maintenance;
- corrective maintenance; and
- major operating projects (MOPS).

These types of activities are forecast for each major asset category: transmission lines, substations, secondary systems, communications and easements.

The forecasting approach for each type of activity is as follows.

Preventative Maintenance and Inspections

Maintenance inspections and routine preventative maintenance tasks are scheduled by TransGrid's enterprise resource planning system in accordance with the maintenance requirements set out in TransGrid's maintenance policies. Maintenance intervals or operations based triggers are defined based on manufacturers' advice, TransGrid's experience and good electricity industry practice. It should be noted that these intervals are generally longer than one year, and therefore there can be some variation in activity from year to year.

Forecast maintenance costs are therefore based on forecast effort for each particular year from the enterprise resource planning system (in employee hours) and hourly maintenance unit rates from the base year.

The forecast effort reflects the effort required to maintain the network that existed at the time of the base year. However, it does not include the maintenance of new network elements that are commissioned in the next regulatory control period. Therefore, an allowance for growth in the size of the network is applied to reflect the increase in maintenance requirements arising from this growth. Network growth is calculated as:

$$\textit{Network growth} = \frac{\textit{Forecast capital expenditure resulting in a change to network size}}{\textit{Replacement value of network}}$$

Notably, the growth calculation incorporates forecast capital expenditure that decreases the size of the network as well as that which increases the size of the network. In some cases, where part of the network has grown economically over time through incremental increases in capacity, a replacement project can provide an opportunity to replace existing assets with fewer, larger assets. This results in reduced maintenance requirements, and is included in the calculation as negative growth.

Similarly, where changes to demand patterns result in a decrease in electricity demand in a particular area, existing assets may be redeployed to other locations if they are in serviceable condition or decommissioned if they are reaching the end of their serviceable lives. Following the recent closure of the Kurri Kurri aluminium smelter in 2012 TransGrid is decommissioning a large power transformer that would otherwise have required replacement. These are also included in the network growth calculation as negative growth.

An economy of scale factor is applied to network growth, to reflect the scale efficiencies that can be achieved when maintaining a larger network. This has the effect of limiting the effect of network growth on forecast operating expenditure.

Network growth is calculated for each major asset category and for the network as a whole.

Condition Based Maintenance and Corrective Maintenance

Condition based maintenance and corrective maintenance are scheduled as needed based on equipment condition. It is therefore not practicable to schedule specific maintenance tasks in these categories beyond the immediate future.

TransGrid's maintenance policies have remained stable over a number of years, therefore condition based and corrective maintenance effort can be modelled as a ratio to preventative maintenance and inspection effort. These categories are forecast based on an

historical average ratio of their hours to scheduled preventative maintenance and inspection hours.

As network growth is applied to scheduled preventative maintenance and inspections, it is also applied to condition based maintenance and corrective maintenance.

Major Operating Projects (MOPS)

Major operating projects (MOPS) are asset refurbishment and small replacement projects. They often relate to particular families of equipment that exhibit condition issues such as a model of transformer bushing or type of transmission line insulator. They are more similar in nature to capital projects than operating expenditure, and TransGrid estimates them accordingly using a zero-based portfolio approach.

An alternative approach, the use of a trend based on historical expenditure, would be less well suited to taking into account the distinct needs that drive this expenditure. Accordingly, TransGrid has not used this approach as it may under or over forecast the efficient costs required to meet the operating expenditure objectives.

2.3.2 Non-Maintenance Activities

Base – Step – Trend Approach

Expenditure for the majority of non-maintenance activities is forecast using the base – step – trend approach, which is as follows.

1. The base – step – trend approach forecasts expenditure from a base year that reflects an efficient level of operating expenditure. TransGrid uses the most recent year for which audited actual expenditure is available as the starting point for its base year. For the upcoming revenue proposal, this is 2012/13. TransGrid regards 2012/13 as an efficient base year because:
    - the regulatory framework provides incentives to minimise costs (the “revealed costs” approach); and
    - through rigorous use of benchmarking TransGrid has confirmed that its costs compare favourably with its peers in Australia and overseas.
2. The approach provides for specific adjustments to expenditure through the inclusion of step changes. These include adjustments for abnormal costs in the base year, the addition of new obligations that commence after the base year and the removal of costs that cease after the base year.
3. The approach then applies trends for cost pressures above the consumer price index (CPI). These are primarily from growth in the network, which increases the number of assets to be maintained, and labour rate increases which are forecast to increase at a rate higher than CPI. Materials cost increases are forecast at CPI.

Economy of scale factors relevant to each activity are applied to network growth, to reflect the scale efficiencies that can be achieved when managing a larger network. This has the effect of limiting the effect of network growth on forecast operating expenditure.

Non-maintenance activities that are forecast using the base – step – trend approach are summarised in Table 2.1.

Table 2.1
Non-Maintenance Activities Forecast as Base – Step – Trend

Category	Description
Maintenance Support and Asset Management	This category includes the following activities: • development of asset management plans, maintenance policies and service provider performance reviews; • management of field maintenance teams including resource management and work scheduling; • administration of information systems that directly support field maintenance activities; and • fleet, warehousing and supply management.
System Operations	24 hour network control room operations, outage planning, technical studies to support the operation of the system and management of the SCADA system.
Grid Planning	Planning the development of the transmission network and capital portfolio management.[7]
Rates and Taxes	Municipal and utility rates, and taxes other than corporate income tax.
Property	Ongoing management of property, easements, buildings and related issues including acquisitions, disposals, surveys and management.
Health, Safety and Environment	Management of TransGrid's Health and Safety and Environmental Management quality systems.
Information Technology	Management of information systems including networks, hardware and software, and office telephone systems.
Business Administration	Finance, human resources and payroll functions.
Corporate and Regulatory Management	Corporate activities including legal, audit and customer relations. This category includes regulatory functions, including revenue reset.

Zero-Based Approach

TransGrid uses a zero-based approach for expenditure categories where it provides a more reasonable forecast than historical costs. A zero-based approach uses an external estimate or bottom-up cost build up to estimate the total cost of a particular activity.

The operating expenditure categories forecast using the zero-based approach are summarised in Table 2.2.

[7] The Grid Planning category includes the Identify Need, Compile Program and Evaluate Options stages of the *Network Investment Process* described in Section 3.2, which are operating expenditure.

Table 2.2
Zero-Based Operating Expenditure Categories

Category	Description
Insurance	Costs associated with the insurance of TransGrid's assets and operations.
Self Insurance	Costs associated with self insurance, where this is more economic than insurance procured from an external insurance company or where procured insurance is not available.
Debt Raising Costs	Forecast as the costs facing a benchmark efficient firm, consistent with the approach to determining the allowed rate of return.
Network Support	Procurement of network support to avoid or defer capital expenditure, where this is known at the time of the revenue proposal. This is forecast as specific projects that are required to meet network needs.

2.4 Cost Escalation

TransGrid faces cost pressures above the consumer price index (CPI). For operating expenditure, the main cost pressure is labour rate escalation.

TransGrid uses labour rate escalation based on:

- its employee agreement, for internal labour during the period covered by the agreement; and
- the wage price index (WPI) for internal labour after the period covered by the employee agreement and for all external labour.

Materials cost increases are forecast at CPI.

2.5 Employee Entitlements

In recent revenue determinations the AER has indicated a preference to base operating expenditure forecasts on the forecast cash costs paid for employee benefits such as long service leave and contributions to certain superannuation schemes, rather than the methodology used in the financial accounts of 'provisions' to recognise the forecast value of employee entitlements earned in the period.

TransGrid's operating expenditure allowance for the 2009/10 to 2013/14 regulatory control period was based on a provisions approach. However, for the upcoming revenue proposal TransGrid has forecast operating expenditure based on forecast cash costs paid, in line with the approach taken by the AER in recent revenue determinations.

2.6 Inputs and Assumptions

A summary of the inputs and assumptions TransGrid has used to forecast operating expenditure is shown in Table 2.3.

Table 2.3
Summary of Operating Expenditure Inputs and Assumptions

Category	Assumption
Standards	Asset management, maintenance and operations performed as set out in TransGrid's Network Management Plan and related asset management procedures
	Compliance with legislative obligations
	Compliance with Australian standards
	Application of good electricity industry practice
Forecasts	Inflation based on geometric average of Reserve Bank *Statement on Monetary Policy* for two years and the mid-point of their target range for eight years
	Internal labour cost escalation based on TransGrid's employee agreement for the duration of the agreement and Wage Price Index (WPI) forecasts for the NSW Electricity, Gas, Water and Waste Services (EGWWS) sector thereafter
	External labour cost escalation based on WPI forecasts for the NSW EGWWS sector
	Materials cost escalation of CPI
	Network growth estimated based on forecast capital expenditure resulting in a change to network size as a proportion of replacement value of the network
Models	TransGrid's operating expenditure model
Key Inputs	2012/13 expenditure with adjustment for abnormal costs is an efficient base year from which to project costs for future years
	Preventative maintenance based on forecast effort from TransGrid's enterprise resource planning system and rates from the base year
	Condition-based and corrective maintenance forecast as a ratio to preventative maintenance for each asset class
	Major operating projects (MOPS) estimated using a zero-based portfolio approach
	Labour and non-labour split for external costs estimated based on analysis of representative major contracts
	Insurance based on forecasts from TransGrid's insurance provider
	Self-insurance forecasts based on actuarial assessment
	Debt raising costs based on the costs facing a benchmark efficient firm, consistent with the approach to determining the allowed rate of return

3 Capital Expenditure

Capital expenditure is expenditure on the infrastructure and assets that provide transmission services. These include new assets that increase capacity on the network, replacement of existing assets that are reaching the end of their serviceable lives and minor assets such as information technology and vehicles.

This chapter describes TransGrid's approach to forecasting capital expenditure.

3.1 National Electricity Rules

The National Electricity Rules set out the capital expenditure objectives to be achieved by forecast capital expenditure.

The capital expenditure objectives are to:

1. Meet or manage the expected demand for prescribed transmission services over that period
2. Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services
3. To the extent that there is no applicable regulatory obligation or requirement in relation to:
   (v) the quality, reliability or security of supply of prescribed transmission services; or
   (vi) the reliability or security of the transmission system through the supply of prescribed transmission services,

   to the relevant extent:
   (vii) maintain the quality, reliability and security of supply of prescribed transmission services; and
   (viii) maintain the reliability and security of the transmission system through the supply of prescribed transmission services
4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[8]

The applicable regulatory obligations in relation to the quality, reliability and security of supply that apply to TransGrid are set out in the *Transmission Network Design and Reliability Standard for NSW* published by NSW Trade & Investment.

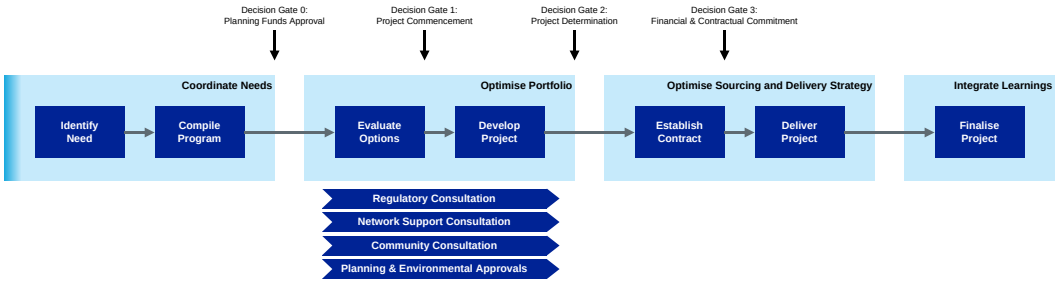
[8] *National Electricity Rules*, Rule 6A.6.7(a).

TransGrid's approach to forecasting capital expenditure has been developed to uphold the capital expenditure objectives and applicable regulatory obligations. It seeks to efficiently meet TransGrid's obligations in regard to the price, quality, safety, reliability and security of the transmission network.

3.2 Network Investment Process

The majority of TransGrid's forecast capital expenditure relates to the network. TransGrid has developed a *Network Investment Process* that is used to develop the capital portfolio relating to the network. The full process is shown in Figure 3.1 as it applies to major capital works. An abridged version of the process applies to minor projects and programs of work.

Figure 3.1
Network Investment Process



The *Network Investment Process* has seven stages, as described in Table 3.1.

Table 3.1
Network Investment Process Stages

Stage[9]	Description	Optimisation
Identify Need	Identification of needs through processes such as planning studies, asset condition monitoring and customer requests.	Identification of related, pre-requisite and dependent needs.
Compile Program	This stage captures all of the needs in one program of work, evaluates high level risks and sets initial milestone dates.	
Evaluate Options	Identification, initial scoping and economic evaluation of options to address each need. These include operational measures, control schemes, network support options and network options.	Identification and evaluation of options across the whole portfolio, such as options that may satisfy multiple needs.
Develop Project	Develops the most cost effective option into a project. It includes detailed scoping, regulatory and planning approvals.	
Establish Contract	Formal assignment of the project to a project manager following all necessary approvals, and contract establishment.	Selection of the most appropriate sourcing and delivery strategy for each project.
Deliver Project	Construction and commissioning for network projects, or delivery for operational or network support projects.	
Finalise Project	Completion of the project.	Post-project review of outcome against need and key learnings.

All future capital projects included in the revenue proposal have been developed to completion of the Evaluate Options stage or beyond. This means that the most cost effective option has been selected for each project and options have been optimised across the portfolio, and that cost estimates reflect the most likely cost to deliver each project.

All committed capital projects have been developed to completion of the Develop Project stage or beyond. This means that detailed scoping has been completed for each project, and most committed projects are in progress.

The governance that overarches network investments is set out in TransGrid's *Corporate Governance Framework for Expenditure on Major Capital Works Projects*. The framework defines four decision gates through which investments pass:

- **Planning Funds Approval (DG0):** Approval of the need statement and commencement of a range of activities, including development and evaluation of options.
- **Project Commencement (DG1):** Following desktop evaluation of network and non network options, the most efficient and commercially acceptable feasible solution to

[9] The Identify Need, Compile Program and Evaluate Options stages of the *Network Investment Process* are operating expenditure.

address the need is selected for more detailed scoping. Where multiple solutions evaluate closely, more than one may be selected for detailed scoping. This decision gate includes approval to progress and commence a range of activities: the applicable regulatory investment test, preliminary design work, community consultation and environmental assessments (if applicable), and any property acquisitions required prior to Decision Gate 2.

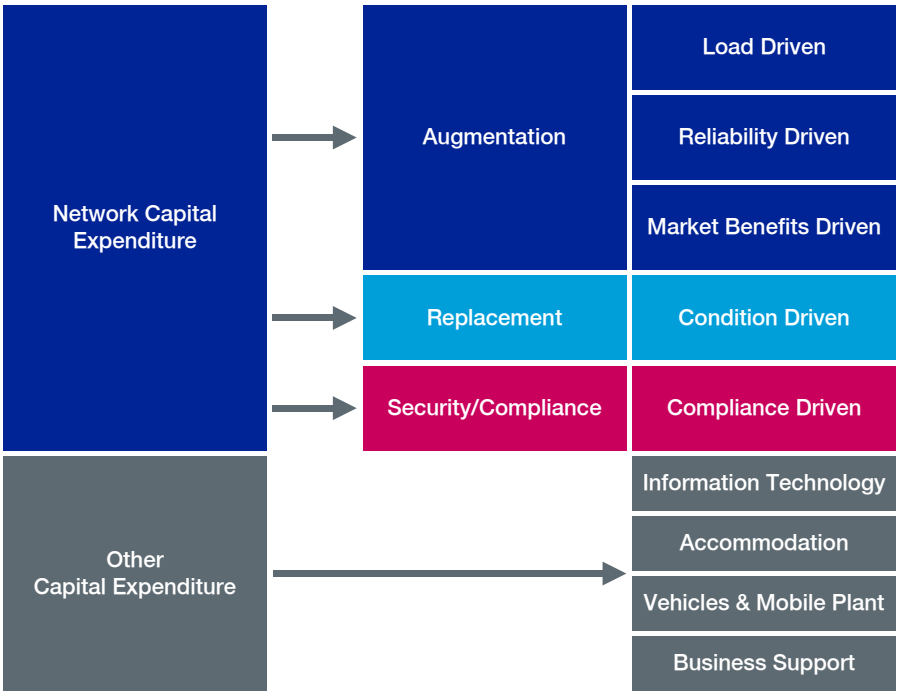
- Project Determination (DG2): DG2 confirms the selection of the network or non network option which has been demonstrated to be the most efficient and commercially acceptable feasible solution to address the need. This decision gate will follow completion of the relevant regulatory tests and environmental approvals where possible, or progression of these activities such that there is a high level of confidence that approvals will be obtained.
- Financial and Contractual Commitment (DG3): This decision gate encompasses the decision which commits TransGrid to full funding for the project, which may involve non-network solutions, and is done in conjunction with and prior to the first major procurement or construction contract on the project.

To develop the capital expenditure forecasts for the revenue proposal, more than 2,000 planning and scoping documents have been prepared in alignment with the *Network Investment Process*. These documents have generally been developed internally by TransGrid's planning teams, and then tested for quality assurance by teams of external engineering specialists.

3.3 Capital Expenditure Categories

The categories of capital expenditure are shown in Figure 3.2.

Figure 3.2
Capital Expenditure Categories



Load driven augmentation projects are required to meet electricity demand. They are developed based on network models and either state demand forecasts prepared by AEMO for the main grid, or connection point forecasts prepared by distribution network service providers for subsystems and connection points.

Reliability driven augmentation projects are required to meet a particular reliability standard. They are specifically requested by jurisdictions where a particular standard is to be applied.

Market benefits driven augmentation projects are investments in transmission capacity that provide greater access to lower cost generation in the wholesale electricity market. These projects result in economic benefits that exceed the project costs, providing a net economic benefit to consumers.

Replacement projects are driven by the condition based risks of assets that are reaching the end of their serviceable lives. TransGrid has adopted an economic methodology to assessing the condition based risks of its assets and determining the need for replacement or refurbishment.

Security/compliance projects are driven by external compliance requirements such as legislation, jurisdictional requirements or particular standards.

Other capital expenditure includes information technology, office accommodation, vehicles and mobile plant, and other business support assets.

3.4 Capital Accumulation Model

TransGrid's capital expenditure is forecast as a bottom-up build up of projects and programs of work. Projects are individually scoped to meet specific network needs, such as needs to augment the network or replace assets reaching the end of their serviceable lives. Programs of work are groups of similar minor projects, such as replacement of a particular model of equipment that exhibits consistent issues across the network.

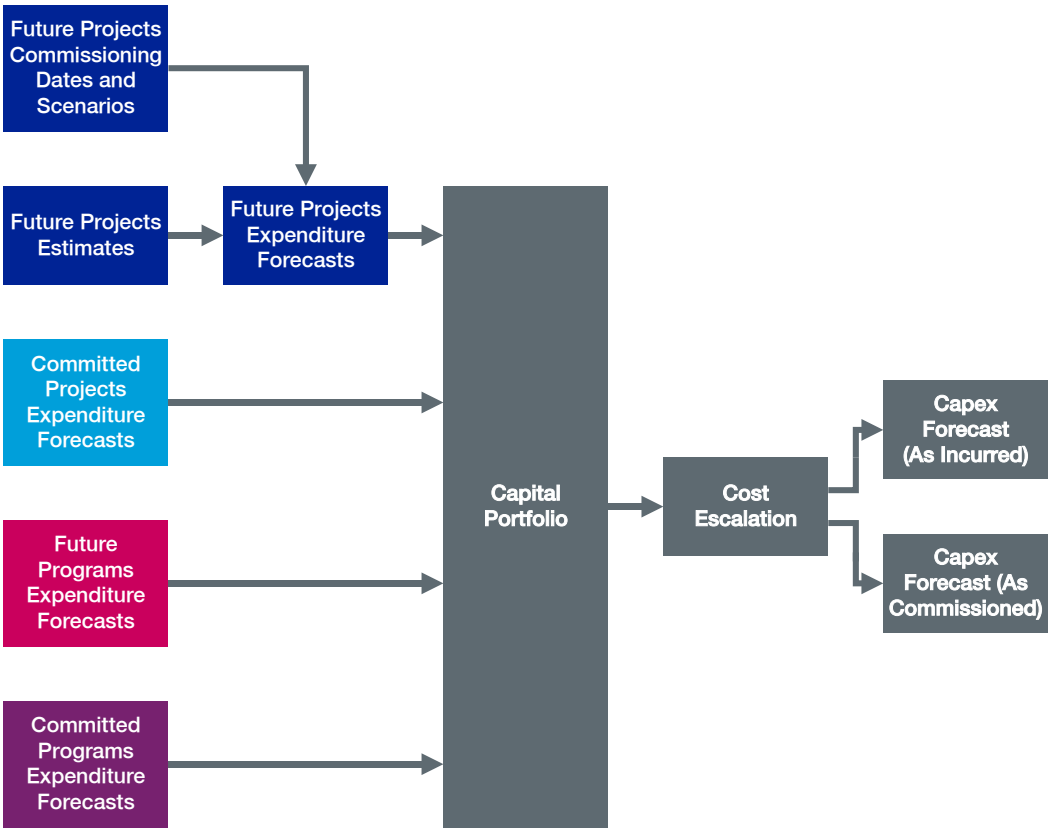
Projects and programs of work are justified based on technical requirements and cost/benefit evaluation.

The projects and programs of work are compiled in the capital accumulation model. The model aggregates the expenditure profiles of individual projects, applies escalation for labour, commodities and property, and allows for expenditure profiles to be considered for future projects under a number of scenarios such as market and demand scenarios. Projects are costed in 2013 year dollars and then escalation is applied to reflect the relevant timing of the expenditure within the regulatory period.

The capital accumulation model has the option to apply a cost estimating risk factor to projects according to their type, such that the forecast expenditure represents the most likely, or P50, cost of delivering the portfolio. TransGrid does not propose the use of a portfolio level cost estimating risk factor in its 2014-2019 revenue proposal, as its cost estimating methodology produces project estimates that are P50 (the most likely cost).

The capital accumulation model methodology is shown in Figure 3.3.

Figure 3.3
Capital Accumulation Model Methodology



3.5 Estimating Process

TransGrid prepares estimates for projects and programs of work as follows.

3.5.1 Future Projects

A future project is a project that is prior to Decision Gate 2 – Project Determination in the *Network Investment Process*.

The cost estimates for future projects are based on a desktop engineering assessment of the project option, expected delivery method and time for the project. The scope determined from this assessment is used to develop an estimate of the project cost.

Estimates for future projects are prepared using the *Success Enterprise* estimating system. They comprise a base cost estimate for major scope components and an allocation of allowances.

- The base cost estimate is developed based on the major scope components. It is built from standard market costs for equipment and materials and cost factors for design, commissioning and other works. It does not include allowances for risk, cost escalation or contingency.
- The allocation of allowances is a costed value for project variables required to deliver the project scope. It is developed based on expected scope costs that are

not able to be fully defined at this stage of the project. This is based on an assessment of occurrence in past projects.

The cost estimating methodology for future projects produces estimates that reflect the most likely, or P50, cost of delivery. The standard market costs used to develop estimates are derived from competitive tender costs, ensuring that the estimates reflect the efficient costs to deliver the project scope.

Cost escalation is applied to future projects in the capital accumulation model to accommodate expected changes in labour, commodity and property prices or inflation.

3.5.2 Committed Projects

A committed project is a project that has passed Decision Gate 2 – Project Determination in the *Network Investment Process*.

For committed projects, the expected outturn cost for the project is used for the expenditure forecast. The expected outturn cost is the most recent estimate of the cost to complete the project and is determined from contract costs, funding approval or detailed project scope depending on the stage in project delivery.

Cost escalation is not applied to committed projects in the capital accumulation model, as it is not required once contracts are established and variations in major plant costs can be mitigated through hedges.

3.5.3 Future and Committed Programs

A program of work is a group of similar minor projects that often relate to a particular family of equipment that exhibits condition issues. These include a particular model of circuit breaker, type of protection relay or model of communication device.

Estimates for programs of work are based on standard costs for each activity. These are comprised of standard market costs for equipment and standard labour rates.

3.6 Inputs and Assumptions

A summary of the inputs and assumptions TransGrid has used to forecast capital expenditure is shown in Table 3.2.

Table 3.2
Summary of Capital Expenditure Inputs and Assumptions

Category	Assumption
Standards	Asset management, replacement and refurbishment performed as set out in TransGrid's Network Management Plan and related asset management procedures
	Transmission reliability standards as set out in the National Electricity Rules and the *Transmission Network Design and Reliability Standard for NSW*
	Compliance with legislative obligations
	Compliance with Australian standards
	Application of good electricity industry practice
Forecasts	New South Wales state demand forecasts as set out in the *National Electricity Forecasting Report 2013* published by AEMO
	Connection point demand forecasts as advised by NSW and ACT distribution network service providers
	Inflation based on geometric average of Reserve Bank *Statement on Monetary Policy* for two years and the mid-point of their target range for eight years
	Internal labour cost escalation based on TransGrid's employee agreement for the duration of the agreement and Wage Price Index (WPI) forecasts for the NSW Electricity, Gas, Water and Waste Services (EGWWS) sector thereafter
	External labour cost escalation based on WPI forecasts for the NSW EGWWS sector
	Cost escalation for market based commodities externally forecast by SKM
	Property escalation externally forecast by BIS Shrapnel
Models	TransGrid's capital accumulation model
	Network models for network planning
	Market models for market benefits modelling
Key Inputs	Individual project and program of work scopes developed to meet augmentation, replacement, security/compliance and other requirements
	Cost estimates developed as described in Section 3.5

3.7 Network Support

Network support refers to alternatives to network investment that can meet supply requirements, and defer or avoid the need for capital expenditure. Network support is a

broad term that includes demand management, which refers to consumers agreeing to switch off part or all of their electrical loads at times of peak, and distributed generation, which is the connection of generation close to electrical loads that reduces the need for transmission network capacity.

In the last five years TransGrid has procured network support of 350MW to defer the Western 500kV Upgrade in 2008/09 and 40MW that has allowed it to defer the Western Sydney Supply Project in 2012/13.

TransGrid continues to proactively pursue network support options as an alternative to network investment. Under the network investment process described in Section 3.2, network support options are considered for all network needs.

Consistent with recent AER decisions,[10] TransGrid will include forecasts for network support in the revenue proposal if it is certain, that is, contractual arrangements have been entered into or a Regulatory Investment Test for Transmission (RIT-T) has been completed.

3.8 Contingent Projects

The contingent project mechanism has been included in the regulatory framework to cater for projects that have uncertainty around timing or cost.[11]

It mitigates the risk of uncertainty of project investment for both consumers and TNSPs, by ensuring that where particular capital expenditure is uncertain TNSPs have a mechanism to trigger the works if necessary but consumers do not bear the costs unless the works are triggered. Given the length of time between submission of a revenue proposal and conclusion of the regulatory control period to which it applies, contingent projects facilitate responsive and efficient investment decision making where investment drivers change during this time. In doing so, they uphold the National Electricity Objective.

TransGrid will propose contingent projects in the revenue proposal where there is sufficient uncertainty around their timing or cost.

[10] AER, *Draft Decision: Powerlink Transmission Determination 2012-13 to 2016-17*, November 2011, p199.
[11] National Electricity Rules, Rule 6A.8.1(c)(5).