Country Energy's Electricity Network *Regulatory Proposal* 2009-2014

2 June 2008

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Executive Summary

1 Executive Summary

1.1 About Country Energy

Country Energy's core business is to operate a safe and efficient electricity distribution network service for its customers, 24 hours a day, every day of the year.

Country Energy's electricity distribution network extends across an operating area covering 95 per cent of New South Wales' land mass, and into parts of Queensland, Victoria and the Australian Capital Territory. Country Energy's network is unique in Australian terms, characterised by medium to very low customer density, and wide variations in topographical and climatic conditions.

Since 2001, Country Energy has delivered significant investment programs to deliver the energy services customers expect. Country Energy is recognised for its first class customer service, innovative approaches to employment and energy efficiency, and its commitment to local communities.

Country Energy's ambition is to be Australia's best essential services provider, and our key strategic priorities are:

- Safety – continuing to improve employee and public safety and health
- Service – maintaining customer service levels and meeting reliability expectations
- Value – providing an efficient, value for money service for customers, and
- Sustainability – developing a resourceful workforce and protecting the environment.

1.2 Context for this *regulatory proposal*

Country Energy's *regulatory proposal* encompasses a five year *regulatory control period* commencing on 1 July 2009 and ending on 30 June 2014. Our *regulatory proposal* has been prepared in accordance with the requirements of the *National Electricity Law, National Electricity Rules* and the various requirements of the *Australian Energy Regulator (AER)*. Our *regulatory proposal* describes, insofar as possible, the services Country Energy intends to provide to customers over the 2009 to 2014 period.

Country Energy's *regulatory proposal* for 2009 to 2014 consolidates improvements and efficiencies achieved in 2004 to 2009, and is designed to meet the ongoing and increasing challenges confronting all electricity network service providers, including:

- ageing asset profiles and varying asset conditions
- growing populations and changing consumption patterns
- increasing reliability expectations
- growing safety and environmental responsibilities, and
- escalating costs of key inputs including labour, metals and fuel.

Country Energy has demonstrated its ability to respond to these challenges, and has adopted long term plans to remain an efficient and effective steward of the electricity assets on which customers depend.

1.3 Country Energy's *Network Asset Management Plan*

Country Energy's investment programs derive from our *Network Asset Management Plan* (*NAMP*). The *NAMP* provides for the strategic management of physical system assets to best support the delivery of electricity network services. It consolidates into a single strategic document, Country Energy's network service delivery strategy. The *NAMP* includes asset management strategies, policies, processes, resources, planned capital investments, asset maintenance, and demand management initiatives.

The *NAMP* provides a comprehensive overview of the condition of network assets and specifies reliability, security and availability targets. The *NAMP* identifies strategic plans for capital investment for augmentation, asset renewal, reliability and quality of supply improvement, and asset inspection, vegetation control and maintenance, over a long term planning horizon.

Country Energy has developed a detailed expenditure program in accordance with the *NAMP,* taking into account sound industry practice, realistic plans and strategies, and the following key specific factors:

- independently assessed forecasts of growth
- condition and age based asset assessments
- licence conditions relating to reliability and security of supply
- environmental, safety, security and legal compliance requirements, and
- alternatives to capital expenditure, including efficient operating expenditure and demand management.

The *NAMP* represents Country Energy's overall long-term investment strategy, with a focus on, prudency, efficiency and sustainability. The *NAMP* has informed our maintenance and investment forecasts.

1.4 Increases in costs and investment levels

Changes between actual expenditures in the 2004 to 2009 period and the forecasts for the 2009 to 2014 period are largely driven by:

- high rates of growth in parts of the network
- asset renewal to stabilise the average age and condition of key network components
- new reliability and security compliance requirements
- upward pressure on key input costs and external contracting costs, and
- offsetting productivity and efficiency gains.

Increasing global demand for fundamental inputs to powerlines and transformers including copper, aluminium and oil, as well as increased local and national demand for skilled labour, have increased expenditures in the 2004 to 2009 period and forecasts for the 2009 to 2014 period.

To illustrate the scope of these challenges, Country Energy's work vehicles travelled a combined 64 million kilometres in the past year, reflecting the nature of our network. Despite a decentralised structure, the increasing fuel efficiency of our fleet of vehicles and better work scheduling, fuel costs are forecast to further increase, as are labour and materials costs.

Projects and programs to increase reliability and security will be largely undertaken by externally contracted resources, including major substation construction and additional vegetation management. While competitive external contracting provide reflects a market-based, efficient solution to the delivery of these projects and programs, external contractors are also exposed to increases in labour, material and fuel costs, and will seek to pass these costs back to Country Energy.

Our proposed proactive asset refurbishment, renewal and vegetation management projects are designed to improve the reliability and security of electricity supplies – hence Country Energy proposes to offset future fault and emergency operating costs. Country Energy has also forecast productivity gains in resourcing its internal programs of work.

Country Energy understands that it must continue to find better ways to fulfil its responsibilities to customers. Country Energy is responding to fundamental network challenges and their costs, yet must seek an increased level of sustainable expenditure to deliver necessary projects and programs of work. It is necessary to increase these expenditures in the 2009 to 2014 period, to avoid a higher level of increase in expenditures in later periods.

1.5 Forecasts of maintenance and investment expenditure

Country Energy's *regulatory proposal* forecasts capital expenditure of $4.0 billion and operating expenditure of $2.2 billion over the 2009 to 2014 period. Country Energy has sought to optimise the balance of capital and operating expenditure, and has the capacity to efficiently resource its proposals.

Country Energy has followed the requirements of the *National Electricity Rules* and the *AER* in calculating revenue requirements, and the consequent increase directly relates to the maintenance and investment expenditure detailed in this *regulatory proposal*.

Events likely to have a bearing on our forecasts for 2009 to 2014, but are uncertain at this time, are also discussed in this *regulatory proposal* – for example, a mandated rollout of smart meters. Country Energy has considered the opportunities associated with advanced metering infrastructure, and how further 'intelligent network' innovations could enable better energy efficiency for customers, better network reliability and demand management and better penetration of alternative generation sources, including renewables.

1.6 Conclusion

Overall, Country Energy's *regulatory proposal* is designed to deliver a safe and efficient electricity distribution network service through:

- a responsive investment program matched to growth and changing consumption patterns
- a cost reflective maintenance and refurbishment program aiming to maintain 'end to end' asset condition – from major substations to home service mains and meters, and
- updated skills, tools and technological capability to resource these tasks and realise efficiencies.

Country Energy believes that its proposals can deliver a reliable, affordable and sustainable electricity distribution network service for customers.

Introduction

2 Introduction

2.1 Country Energy's *regulatory proposal*

Country Energy is a *regulated network service provider* (*RNSP*), operating an electricity distribution network that extends across an operating area covering 95 per cent of New South Wales' (NSW) land mass, and into parts of Queensland, Victoria and the Australian Capital Territory. Within NSW, Country Energy is licensed to operate its network under the *Electricity Supply Act* 1995 (NSW).

Country Energy's weighted average price cap (WAPC) for the *current regulatory control period* was determined by the Independent Pricing and Regulatory Tribunal of NSW (IPART) in accordance with Chapter 6 of the *National Electricity Code* (the predecessor to the *Rules*) in June 2004 – this *determination* (the *IPART determination)* expires on 30 June 2009[1].

The *Australian Energy Regulator* (*AER*) assumed responsibility for the economic regulation of electricity distribution networks on 1 January 2008 after the enactment of the *National Electricity Law* (the *Law*) and *National Electricity Rules* (the *Rules*). The *AER* is now the jurisdictional regulator with responsibility for making a *distribution determination* as defined under the *Law* and *Rules*.

Due to the timing of enactment of the *Law* and *Rules*, Country Energy is subject to the provisions of the transitional Chapter 6 (the transitional *Rules*) contained in Chapter 11 of the *Rules*, rather than the general Chapter 6.

The transitional *Rules* set out the objectives and principles of the *distribution determination* regime to be administered by the *AER*. Country Energy is required to submit a compliant *regulatory proposal* consistent with the provisions contained in the transitional *Rules*. Relevant aspects of the transitional *Rules* are described in subsequent sections of this *regulatory proposal*.

Country Energy's *regulatory proposal* encompasses a five year *regulatory period* commencing on 1 July 2009 and ending on 30 June 2014. Our *regulatory proposal* has been prepared in accordance with the requirements of the *Law*, *Rules,* and the views expressed by the *AER* in its position papers and finalised models, guidelines and incentive schemes.

Country Energy's *regulatory proposal* comprises:

- This *regulatory proposal* document
- Reference documents contained in the appendices, and
- Completed information pro formas and models as requested by the *AER* in their *regulatory information notice*.

This *regulatory proposal* details Country Energy's intentions for the *next regulatory control period,* aimed at delivering a reliable, affordable and sustainable electricity network service.

Country Energy welcomes feedback in response to this *regulatory proposal*, especially where this may lead to improvements or enhancements to the quality and effectiveness of our services to customers.

[1] IPART, *New South Wales Electricity Distribution Pricing 2004-05 to 2008-09 Final Decision*, June 2004, Other Paper No 23.

The remainder of this section is structured as follows:

- Section 2.2 provides an overview of Country Energy including our business structure and business environment
- Section 2.3 describes Country Energy's services and performances, and
- Section 2.4 explains the remaining structure of this *regulatory proposal*.

Italicised words and phrases in this *regulatory proposal* have the meaning given to them in the *Law, Rules* or *regulatory information notice*, unless otherwise specified.

2.1.1 Business details

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2.1.2 Contact details

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2.2 Country Energy in overview

2.2.1 Formation and scope

Country Energy was formed in 2001 as the result of the merger of three regionally based electricity distributors. In 2005, Country Energy and Australian Inland amalgamated. Country Energy's network operating area now extends across 95 per cent of NSW's land mass, and into parts of Queensland, Victoria and the Australian Capital Territory. Country Energy now operates with around 4,200 employees serving a customer base that includes around 770,000 network customers.

To better respond to customer needs and reliability of supply expectations, Country Energy continues to support a decentralised regional management structure. This decentralised structure reinforces Country Energy's accountability and commitment to local customers.

Country Energy's workforce operates from 142 Customer and Field Service Centres, nine Regional Offices and several metropolitan locations. This decentralised structure reinforces Country Energy's accountability and commitment to local customers.

2.2.2 Ownership

Country Energy is a statutory State Owned Corporation constituted under the *State Owned Corporations Act* 1989 (NSW), established by the *Energy Services Corporations Act* 1995 (NSW), which describes Country Energy's principal objectives:

> (a) to be a successful business and, to this end, to:
>
> > (i) operate at least as efficiently as any comparable businesses
> >
> > (ii) maximise the net worth of the State's investment in it
> >
> > (iii) exhibit a sense of social responsibility by having regard to the interests of the community in which it operates
>
> (b) to protect the environment by conducting its operations in compliance with the principles of ecologically sustainable development contained in Section 6 (2) of the Protection of the Environment Administration Act 1991
>
> (c) to exhibit a sense of responsibility towards regional development and decentralisation in the way in which it operates
>
> (d) to operate efficient, safe and reliable facilities for the distribution of electricity and other forms of energy
>
> (e) to be an efficient and responsible supplier of electricity and other forms of energy and of services relating to the use and conservation of electricity and other forms of energy, and
>
> (f) to be a successful participant in the wholesale and retail markets for electricity and other forms of energy and for services relating to the use and conservation of electricity and other forms of energy.

A statutory State Owned Corporation is declared to be excluded for the purposes of Section 5F of the *Corporations Act* 2001 in relation to the whole of the *Corporations Law* other than certain provisions relating to financial products, or as may be otherwise declared under the *State Owned Corporations Act* 1989.

2.2.3 Corporate structure

Country Energy's corporate structure reflects its core responsibility of operating an efficient electricity distribution network. The network business is supported by internal corporate divisions to deliver an effective and efficient service to our customers. These internal divisions provide network maintenance and construction, metering and connection services, and customer and corporate services. Only these services functions are the subject of this *regulatory proposal*.

The major source of Country Energy's network revenue comes from *standard control services* with 89 per cent of the network revenue recovered from these services as a proportion of the total network revenue earned by Country Energy. The remaining 11 per cent of network revenue earned by Country Energy relates to *alternate control services* (public lighting) and capital works programs.

Country Energy also offers retail electricity in six states and territories. Our product range includes natural and bottled gas, internet services, and energy and water management solutions.

Country Energy's water business, trading as 'Country Water', is part of Country Energy's Networks and Infrastructure division and provides water and sewerage services to 20,000 people in far western NSW.

Country Energy's gas network business is operated by our wholly owned subsidiary Country Energy Gas Pty Limited. The network comprises of some 1,100 kilometres of mains and transmission pipelines servicing approximately 25,000 customers in southern NSW.

The costs of these Country Energy associates are ascribed under Country Energy's *AER* approved cost allocation methodology.

A depiction of Country Energy's high level structure is shown below in Figure 2.1.

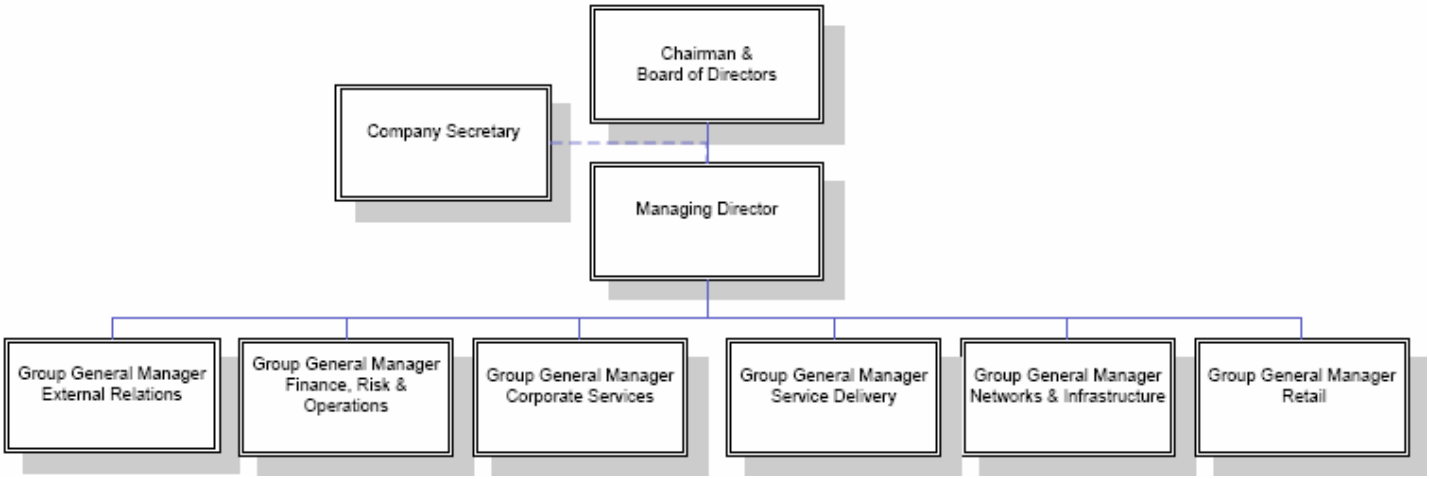

Figure 2.1: Country Energy's Organisational Structure

Table 2.1 shows a breakdown of Country Energy's workforce by division, which are extracted from our human resources system, PeopleSoft.

Division or grouping	Number of employees (full time equivalents)	Number of contractors (full time equivalent)
Networks and Infrastructure	855	4
Service Delivery Network Regions	2034	7
Total Network	**2889**	**11**
Management	11	0
Corporate and Customer Services	526	28
External Relations	62	0
Finance, Risk and Operations	239	12
Information Services	257	16
Total Corporate	**1095**	**56**
Country Water	89	0
Country Energy Gas Networks	22	0
Retail	92	2
Total Other Businesses	**203**	**2**
COUNTRY ENERGY TOTAL	**4187**	**69**

Table 2.1: Country Energy employee numbers by division

Country Energy's divisions perform the following functions:

- *Networks and Infrastructure* – includes management of electricity, gas and water networks, 24 hour a day operation of the electricity network, 24 hour a day supply interruption customer contact service, and network services and strategy.
- *Service Delivery* – includes nine geographical regions and a management team, responsible for providing resources to maintain and enhance the network, asset inspection and maintenance, rectifying system faults, and local customer services and stakeholder relations.
- *Corporate Services* – includes safety and environment, human resources, program implementation, information services, customer services and operational excellence.
- *External Relations* - includes corporate strategy and development, regulatory and legal, government relations, communications and marketing, and customer relations.
- *Finance, Risk and Operations* – includes finance, energy trading, risk management, credit control, treasury and middle office, fleet, property and supply chain.
- *Retail* – includes retail products and services, including retail electricity, natural gas, bottled liquefied petroleum gas, internet services and energy efficiency advice.

2.2.4 Information systems

Country Energy uses a number of key information systems to facilitate the delivery of our electricity distribution services, including:

- *PeopleSoft* – a financial system for project costing and contracts, financial management for maintaining our distribution inventory, budgeting, accounts receivable, accounts payable, general ledger, purchasing, cash management and asset management, and human resource and payroll management.

- *Energy* – a customer information system providing the majority of customer billing and account management, and raising service orders to service delivery employees.
- *Electricity Metering Data Distribution System* (EDDiS) – an application to manage meter data including the meter reading and meter configuration for National Electricity Market Management Company (NEMMCO) and National Electricity Market (NEM) participants.
- *ENMAC* – an integrated network management solution for the monitoring and control of electricity distribution networks, including fault and emergency call management and a geographical information system (GIS).
- *WASP* – an application to manage the design, capacity planning and inspection of network assets. WASP also contains the sub-modules for work management design and estimating, and asset and defect management.
- *Cognos* – a corporate budgeting, planning, forecasting and performance reporting tool.

2.3 Country Energy's objectives and performance

Country Energy's core business is to operate a safe and efficient electricity distribution network for customers within our specified geographical area.

Country Energy's annual Strategy Statement communicates our corporate ambition, priorities, objectives and values. Each annual Strategy Statement is translated into a set of measurable operational objectives contained in a 'Corporate Dashboard.' Country Energy's Corporate Dashboard includes a suite of objectives and key performance indicators, measured and reported monthly or quarterly, across all business perspectives. Each year Country Energy refines these measures and targets to create a clear, common purpose across the business. Country Energy's strategic planning framework links back to divisional budgets, which in turn build up to our annual Statement of Corporate Intent – our corporate performance agreement with our statutory shareholders.

Our current Strategy Statement, Statement of Corporate Intent and this *regulatory proposal* all reflect our aim to provide a reliable, affordable and sustainable electricity network service.

Since 2001, Country Energy has delivered significant investment programs to deliver the energy services customers expect. Country Energy is recognised for its first class customer service, innovative approaches to employment and energy efficiency, and its commitment to local communities.

Country Energy's Board, executive and employees are committed to ensuring the provision of quality network services to customers, the implementation of sound industry asset management practices and preserving the long term value, efficiency and viability of the electricity network for all stakeholders.

Country Energy has established a robust asset management system and processes consistent with these factors and industry best practice, including:

- Best practice asset management strategies and procedures
- Employment of risk management techniques
- Asset investment and decision tools
- Implementation of comprehensive asset information and management systems
- External contracting of non core business activities through competitive tendering and performance contracts
- Governance and business processes for setting and implementing capital and operating budgets, and
- Business reporting and general performance management.

2.3.1 *Safety and health*

The health, safety and well-being of our employees, customers, contractors, visitors, and the public are Country Energy's highest priorities. We are committed to world class safety performance, the maintenance of sound safety management systems and practices, and integrating health and safety into all that we do.

Country Energy has restructured our core safety team and consultative committees, developed new corporate and regional safety improvement plans and improved reporting systems. Continuous reductions have occurred in the Lost Time Injury Frequency Rate, down from 11.7 in 2003-04 to 3.1 in April 2008, our lowest ever result.

2.3.2 *Reliability and security*

Country Energy is focussed on ensuring that network reliability performance is best practice for all areas, including the predominantly overhead rural powerline network. Country Energy is committed to ensuring that reliability and security of supply standards across the network accord with *licence conditions*, published standards, and identified customer requirements.

Country Energy has small sections of network where network performance is below customer expectations. These are typically at the extremities of long rural distribution feeders, and affect a very small percentage of customers. We are committed to implementing programs that offer improved outcomes for these customers consistent with regulatory expectations.

Country Energy is committed to implementing a new program of initiatives to improve average system wide network performance. These are complimented with secondary source of supply programs (known as N-1) for subtransmission and distribution networks.

2.3.3 *Keeping pace with growth*

Country Energy recognises the need to ensure that the network has sufficient capacity to meet additional load. Country Energy will continue to develop growth related capital programs.

2.3.4 *Supply quality*

Country Energy is committed to continue to identify and action supply quality issues that affect our customers and to deliver a new system wide voltage quality improvement program to maximise customer satisfaction.

2.3.5 *Environmental responsibility*

Country Energy's is committed to preserving, and if possible, enhancing the environment by integrating responsible environmental management into all that we do and minimising environmental impacts in our day to day activities.

Country Energy will continue to be a responsible and successful asset owner, promoting leadership in the community and cultivating an internal culture of environmental awareness and recognition of environmental issues, through the application of workable policies and practices that will ensure the network is maintained in compliance with environmental standards and obligations.

2.3.6 *Customer service and community support*

Country Energy has achieved strong customer satisfaction ratings, and has opened 42 new customer and field service centres since 2001. We resolved 97 per cent of customer complaints at the first point of contact in 2006-07, up from 95 per cent the previous year. We have for several years maintained a share of NSW energy industry investigations by the Energy and Water Ombudsman of NSW (EWON) of 7 per cent or less – significantly below our 'natural' market share.

While electricity customers' primary relationship is with their retailer, there is an important role for Country Energy's network business to play in providing quality customer care. Country Energy is committed to delivery of outstanding service to every customer, every time.

Country Energy intends to remain an active and supportive member of the communities to which our customers belong. We are committed to the retention of a decentralised structure to provide rapid response to network performance issues.

2.3.7 Innovation

Country Energy attempts to meet changing customer and energy demands innovatively, including energy efficiency, demand management and distributed generation services. Country Energy conducted Australia's first residential advanced metering trial, featuring an in-home display unit and dynamic price signalling.

In 2006, County Energy established an Operational Excellence Office with the objective of facilitating the implementation of operational excellence programs that improved business performance through superior customer service levels, heightened employee engagement, productivity gains and improvements in safety and environmental management.

2.3.8 Workforce planning

Country Energy is committed to the implementation of innovative approaches to recruitment, retention, training, skilling, and knowledge development of personnel to ensure that an adequate resource pool is available to deliver our proposed works program for the long term benefit of all our customers.

Country Energy has implemented an industry leading apprenticeship intake program with an apprentice intake of more than 670 since 2001, and established a multi-award winning Indigenous Apprenticeship Program. Country Energy is now the largest direct employer of Indigenous apprentices in NSW.

Country Energy has, and will continue, to invest in its workforce to ensure that an adequate resource pool is available. The long term interests of customers are served by having sustainable levels of skilled resources to enable our network to be adequately maintained and developed. The ongoing implementation of employment programs, including our industry leading apprenticeship program, is aimed at enhancing our capability to provide high quality customer service.

2.3.9 Performance monitoring and feedback

Country Energy recognises the importance of performance in the delivery of network services. Performance measurement is an important element of our network service delivery strategy, and provides the feedback mechanism to enable optimisation of asset management strategies and plans.

Country Energy will continue to monitor the performance of the network to ensure that it is meeting corporate objectives, *licence conditions*, published standards and customer requirements. Our service performance is monitored through regular customer surveys, regular meetings with local customer groups, and the internal monitoring of safety, quality and reliability of supply. We have established formal feedback mechanisms through our statutory Customer Council, our Rural Advisory Group and Regional Advisory Boards, our customer comments line, EWON reports and customer surveys.

Where performance is found to be below expectations, least cost action plans are to be implemented to achieve the required improvement.

2.4 Structure of this *regulatory proposal*

The remainder of the *regulatory proposal* is structured as follows:

- Section 3 describes in more detail the services to be provided by Country Energy
- Section 4 details Country Energy's operating expenditure performance during the *current regulatory control period* and the forecasts for the *next regulatory control period*
- Section 5 explains Country Energy's capital expenditure performance during the *current regulatory control period* and the forecasts for the *next regulatory control period*
- Section 6 describes the calculated regulatory depreciation allowances
- Section 7 presents the regulated asset base for the *next regulatory control period*
- Section 8 details the weighted cost of capital and financing costs for the *next regulatory control period* and the process and methodology applied by Country Energy in moving from a pre tax to a post tax framework, including calculation of tax depreciation and corporate income tax allowances
- Section 9 presents the proposed application of the efficiency benefit sharing scheme, the demand management incentive scheme, suggested pass through provisions and transitional issues
- Section 10 provides an overview of the revenue outcomes resulting from this *regulatory proposal*
- Section 11 describes Country Energy's proposal for *alternate control services* for the *next regulatory control period*
- Section 12 lists a glossary of terms, and
- Section 13 presents a list of appendices attached to this *regulatory proposal*.

Network and services

3 Network and services

3.1 Overview

Country Energy's core business is the distribution of electricity to customers within our specified geographical operating area. Country Energy's *regulatory proposal* relates to the provision of direct control services including:

- *Standard control services* performed by Country Energy to provide access to our power supply network. These services encompass the ownership, planning, development, design, construction, operation and maintenance of the electricity distribution network to deliver a safe and reliable power supply. *Standard control services* include a range of miscellaneous services, monopoly services and emergency recoverable works, and
- *Alternate control services* performed by Country Energy are construction and maintenance services for public lighting assets.

Other non-distribution services provided by Country Energy are not subject to economic regulation under the transitional *Rules*.

The remainder of this section is structured as follows:

- Section 3.2 describes Country Energy's network and operating environment
- Section 3.3 describes Country Energy's efficient network and related services, and
- Section 3.4 describes Country Energy's resource capability.

3.2 Network and operating environment

3.2.1 Electricity distribution network and operating area

Country Energy operates Australia's largest electricity distribution network by length of powerlines. Some key features of Country Energy's electricity distribution network include:

- Almost 200,000 kilometres of powerlines, 97 per cent of which are overhead, and 3 per cent of other types such as underground
- Around 1.4 million power poles and over 142,000 street lights
- Some 130,000 distribution substations and over 330 zone substations. Over 90 per cent of Country Energy's 132 kV, 66 kV and 33 kV zone substations have two or more transformers installed. The majority of these substations are remotely monitored and controlled by Supervisory Control and Data Acquisition (SCADA) systems
- A diverse range of asset types operating at various voltage levels, from single wire earth return (SWER) through to single and three phase
- Some network components have an age of greater than 70 years, 50 per cent of overhead powerlines are more than 40 years old, and overall weighted average asset age is around 27 years
- Delivery of around 12,000 GWh of energy per year, and
- Current total replacement cost of our network assets has been valued at around $14.7 billion.

Country Energy's non-urban electricity distribution network is predominately 'radial' in nature with single feeders radiating from one source. Given the comparatively high proportion of overhead powerlines there is little opportunity for interconnection or for continuing supply in the circumstance of a planned or unplanned outage. Some Country Energy customers are located over 400 kilometres by powerline length from the nearest zone substation and our longest feeder is over 1,800 kilometres.

Zone substations have been constructed over time to different standards and this too impacts rural customers. Sophisticated urban zone substations assist in maintaining supply for large communities of customers in the event of supply interruptions. Rural zone substations with less sophisticated control capabilities can result in supply interruptions of significant duration to customers.

The extent of Country Energy's decentralised regional structure and its distribution network is illustrated in Figures 3.1 and 3.2 below.

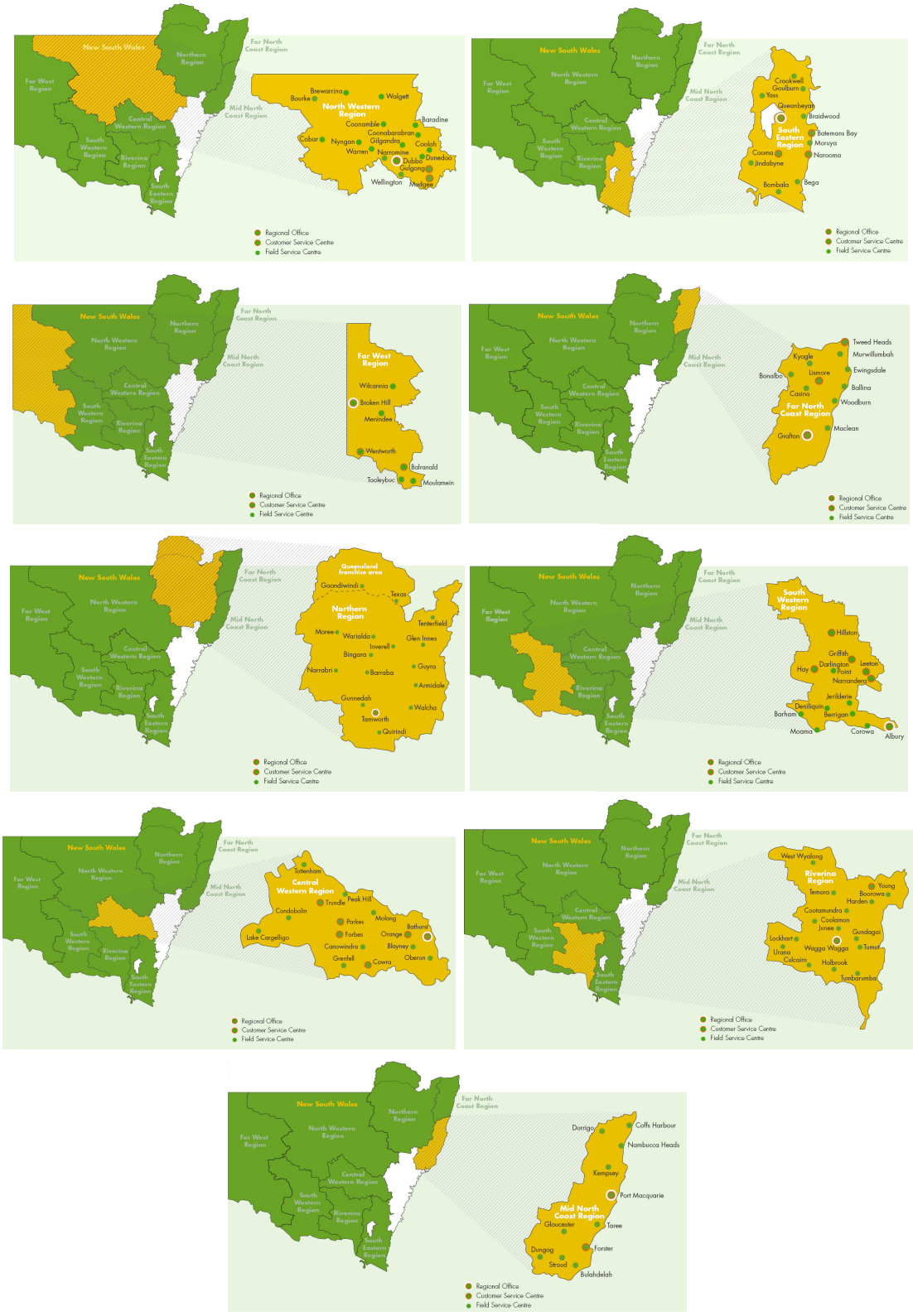

Figure 3.1: Country Energy's operating area and regional structure

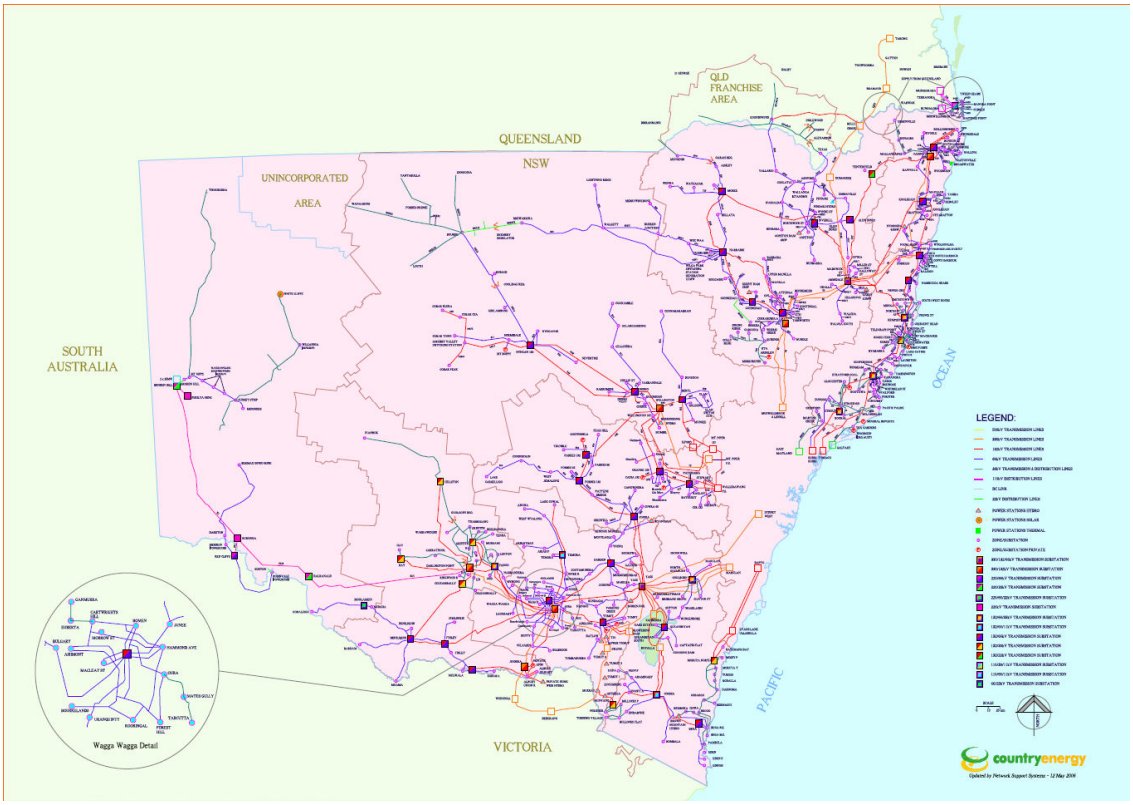

Figure 3.2: Country Energy's subtransmission and distribution asset map

3.2.2 *Network operating environment*

Country Energy has developed strong capabilities in managing a unique country and coastal electricity distribution network. However significant spatial and environmental challenges remain, and are reflected in higher capital requirements, higher operating and maintenance costs per customer, and higher susceptibility to supply interruption and faults, relative to networks in more concentrated urban environments. Some of Country Energy's unique challenges include:

- *Topography* – we serve a geographically diverse network operating area spanning mountains, plains and deserts with climates ranging from alpine to hot arid. Country Energy's network is exposed to a wide range of conditions that affect its mainly overhead powerlines as they cross varying topography. Along the eastern side of the ranges, steep topography severely affects accessibility.
- *Climate* – our network operating area has a high incidence of storms, which in conjunction with the proximity of powerlines to vegetation, makes the overhead network vulnerable to supply interruptions. These interruptions are often difficult to locate and repair due to the length of powerlines involved and the distance that must be travelled. Our network operating area offers fuel for bushfires having abundant native trees, grasses (often very dry in warmer seasons), low humidity and strong hot winds. Fires significantly affect Country Energy's risk management, asset replacement, maintenance, and safety programs. Corrosion also affects network components, resulting from salt build up on insulators due to winds along the coast.
- *Customer density* – Country Energy serves 770,000 network customers across an area of 737,000 square kilometres, and Country Energy has adopted a decentralised management structure to cover its network operating area. There are significant challenges in driving economies of scale for this decentralised management structure and regional network coverage and that is evident in the investment per customer required to ensure all customers receive a reliable supply. While the concentration of customers varies from moderate density in major regional centres to extremely low density, the overall affect is a relatively high cost operating environment.

- *Load variations* – Country Energy's customer base ranges from small isolated farms and communities to large capital intensive businesses, such as mines. Growth in demand varies significantly within and across regions due to population increases varying. Load increases may vary by more than 5 per cent at some substations, but in regions where population growth is slower than average, large step changes in load (whether connections or disconnections) make planning for future capacity challenging.

3.3 Efficient network and related services

Customers and regulators generally expect continuous improvement in levels of service quality and reliability. Country Energy intends to deliver a reliable, affordable and sustainable network service for all customers over the *next regulatory control period* and beyond. This *regulatory proposal* describes, insofar as possible, the services Country Energy intends to provide to customers over the *next regulatory control period*.

Country Energy's *regulatory proposal* consolidates the service improvements achieved in the *current regulatory control period*. The challenge is to meet its general service and compliance obligations in an environment of:

- ageing asset profiles and varying asset conditions
- growing populations and changing consumption patterns
- increasing reliability expectations
- growing safety and environmental responsibilities, and
- escalating costs of key inputs including labour, metals and fuel.

In developing its *regulatory proposal*, Country Energy has considered:

- the expectations of customers
- performance standards, past performance trends and future performance expectations, and
- our ability to resource the proposed projects and programs.

The work programs and expenditures identified in this *regulatory proposal* are required to deliver services that satisfy customers' expectations, respond to our *licence conditions*, and maximise economic efficiency.

3.3.1 Network Asset Management Plan (NAMP)

Country Energy's work programs and expenditure forecasts are derived from its *Network Asset Management Plan 2008-09 to 2013-14 (NAMP)*. The *NAMP* provides for the strategic management of physical system assets to best support the delivery of network services. It consolidates into a single strategic document, Country Energy's network services delivery strategy. The *NAMP* includes the asset management strategies, policies, processes, resources and the planned capital investments, asset maintenance, and demand management.

The *NAMP* draws together detailed asset management strategic plans including:

- Capital Investment Strategic Plan that comprises the Network Augmentation Management Plan, Reliability, Quality, and Security of Supply Management Plan, and the Demand Management Strategic Plan
- Asset Renewal Management Plan
- Asset Maintenance Management Plan, and
- Safety plans.

Country Energy's work programs, expenditure forecasts and resource requirements for the remainder of the *current regulatory control period* and for the *next regulatory control period* are derived from the *NAMP*.

3.3.2 Reliability and security

On 1 August 2005, the NSW Minister for Energy imposed additional conditions on Country Energy's operating licence under the *Electricity Supply Act* 1995 (NSW) relating to design, reliability, and performance of electricity distribution network (*licence conditions*). Following a recent review, these conditions have been replaced with updated and revised conditions, with effect from 1 December 2007.

Country Energy will implement strategies, programs and initiatives to maintain and, where required, improve reliability and security of supply, including:

- Maintaining and optimising the network performance to be compatible with the supply reliability and security requirements of its *licence conditions* and within the objectives set in Country Energy's Electricity Supply Standard, through careful monitoring, management, analysis and planning with cost effective improvements and measures
- Undertaking reinforcement and augmentation capital investments to obtain an N-1 security of supply planning criteria for subtransmission substations, major zone substations, and subtransmission feeders with a load in excess of 15 MVA
- Undertaking reinforcement and augmentation capital investments to obtain an N-1 security of supply planning criteria for high voltage distribution feeders in regional centres
- Improving average reliability performance across the network for the urban and short rural feeder categories to a 20 per cent probability of exceedence (PoE) the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) targets set in the *licence conditions*
- Maintaining average reliability performance across the network for the long rural feeder category to the SAIDI and SAIFI targets set in the *licence conditions*
- Improving individual feeder reliability performance, for SAIDI and SAIFI across the network towards the *licence conditions* for those customers connected to low service performance feeder segments of the network
- Increasing network capacity to match forecast growth, and
- Developing a distribution management system with leading edge technology to provide real time information for network monitoring and planning purposes.

3.3.3 Supply quality

Country Energy will implement power supply quality strategies, programs and action initiatives to maintain and, where required, improve quality of supply, including:

- Maintaining and optimising quality of supply within the objectives set in Country Energy's Electricity Supply Standard, through careful monitoring, management, analysis and planning with cost effective improvements and measures
- Undertaking a new system wide voltage quality improvement program aimed at proactive identification and rectification of steady state voltage quality issues, to progressively bring voltage quality within acceptable limits, and address worst performing areas of the network where steady state voltage is outside limits, such as rural and SWER systems
- Investigating customer quality of supply complaints and providing advice on corrective measures to customers
- Monitoring the network with appropriate technology and devices to improve information gathering, enabling Country Energy to be more pro active in solving steady state voltage regulation problems and managing network performance through real time monitoring of the network, and

- Working with other electricity suppliers nationwide and with appropriate industry groups and organisations to develop solutions necessary to address supply quality issues.

3.3.4 Safety and health

Country Energy will implement safety related strategies, programs and action initiatives, including:

- Ensuring compliance with applicable safety legislation, regulations, standards, codes, and licences
- Striving for an incident free workplace by promoting a 'Safety First' culture and providing necessary training and continued audits
- Maintaining a duty of care to provide a safe network for the community, contractors and employees and actively promote public awareness
- Applying a risk management approach to our works programs
- Being proactive by identifying preventative initiatives to minimise risks associated with the interaction between people and our assets, and
- Continuing to research and implement new designs and construction materials to improve the safety of the network.

3.3.5 Environmental responsibility

Country Energy will implement environmental related strategies, programs and action initiatives, including:

- Ensuring compliance with applicable environmental legislation, regulations, standards, codes, licences and NSW Environmental Protection Authority (EPA) guidelines relating to the construction, maintenance, operation and decommissioning of network assets
- Striving to be an incident free organisation with a comprehensive environmental management plan embracing a range of specific environmental programs and training that are reflected through all aspects of the business
- Applying a risk management approach and use of best practice options to address environmental impacts arising from our activities
- Consulting with all stakeholders (local government, environmental and community groups) for practical, sustainable and economic implementation of solutions for mutual benefits
- Researching and implement new designs and construction materials that are environmentally friendly and improve the visual amenity of assets, and
- Promoting public awareness of energy efficiency and environmental related issues through publications, advertising, community events and our employees.

3.3.6 Customer service and community support

Country Energy will implement customer service and community support related strategies and initiatives, including:

- Delivering ongoing improvements in compliance with guaranteed customer service standards
- Promoting a strong customer service focus throughout the organisation, ensuring equipment, processes and resources are in place to deliver on that focus
- Maintaining a strong local presence in country and coastal communities
- Driving customer focused improvements in our systems, polices and processes
- Ensuring Country Energy's community consultation and engagement is proactive
- Working with local businesses, representative groups and government to grow local business opportunities and implement programs for the benefit of communities, and

- Continuing sponsorship of regional events and encouraging local employees' community participation.

3.3.7 Resourcing

Country Energy will implement resource management strategies, programs and action initiatives to meet future resource requirements, including:

- Ensuring compliance with occupational health and safety regulations
- Identifying resource constraints and skill shortages in order to implement resource mitigation plans, including effective recruitment and retention strategies and training of trade apprentices, technical trainees, and engineering graduates
- Ensuring our employees have the necessary systems, tools and infrastructure to enable them to perform tasks and make informed and efficient decisions
- Enhancing purchasing capability through standardisation, automatic order generation and longer term contracts with suppliers for key material and equipment to serve an expanded work program
- Investing in heavy plant and vehicles, property and buildings, and information and communications technology, to meet network operational requirements, and
- Implementing a more structured approach to contracting external service providers including identifying those specific work areas where support is required and can be adopted and mobilised to deliver any required expansion on current work plans if required.

3.3.8 Innovation

Country Energy will continue to develop innovative approaches to electricity system development that look to meet the future needs of our customers and the community, including:

- Investment in and development of new technologies, including technology to deliver real time network performance information and monitoring
- Developing and investing in more effective design tools
- Promoting research and development projects for sustainable energy efficiency and alternative renewable technologies
- Implementing alternative asset life extension programs, and
- Trialling of alternate materials and equipment that reduce the impact on the environment.

3.4 Country Energy's resource capability

Sections 4 and 5 of this *regulatory proposal* detail Country Energy's efficient capital and operating expenditure intentions, and will require sufficient resource availability.

Country Energy engaged Parsons Brinckerhoff Australia Pty Limited (PB) to independently review and prepare a resource delivery plan that details the capacity of the business to find the resources, internal and external, required for delivery of our forecast works program over the period to 2013-14. The review identified the current resource capability, the future additional resources needed, and the various resourcing strategies, actions and sources of additional resources to deliver the program.

In addition, PB estimated the impact of the various resourcing strategies on the overall availability of labour throughout the planning period and developed a deliverability model for the labour requirements of the capital and operational works. This analysis took into account the skills required, expected attrition rates, redeployment of existing employees, strategic recruitment and external contracting, and training requirements.

3.4.1 *Strategies to increase current resource capacity*

PB recommended various resourcing strategies that can be implemented to increase the current resource capability, involving the release of existing employees for undertaking additional works, the apprentice training program, and productivity improvement opportunities.

Eight separate strategies are proposed for Country Energy in this regard and they are detailed in Appendix A.

3.4.2 *Current resource Initiatives*

Country Energy intends to build upon current resource acquisition and retention strategies into the future, including:

- A continuation of recruitment and building an adequate mix of internal and external resources to complete the required works (also recommended by PB)
- A continuation of the internal employees growth strategies through intakes of new apprentices covering a wide range of disciplines, technical trainees, and engineering graduates (also recommended by PB)
- The active targeting and recruitment of qualified trade people and technical support employees from other related industries, interstate and, wherever possible, overseas distributors, and those apprentices completing their time in other companies
- A continuation of innovative approaches to training, internal employee development strategies and activities to develop the necessary skills required to deliver the works program (also recommended by PB)
- Competitive wage rates to maintain high employee retention rates and attract potential employees
- A continuation of a structured approach to contracting external specialised services through publicly tendered contracts such as subtransmission powerline works, identifying those specific work areas where external support is required, further development of strategic relationships with external service providers to enable improved matching of resource requirement to program resource demands, and the adoption and mobilisation of these resources to supplement peak work demands (also recommended by PB)
- Ensuring that internal contract management resources are in place to effectively manage the increases in project work undertaken by external service providers
- Enhanced purchasing ability through material standardisation, longer-term contracts with suppliers for key material and equipment, and more effective management of inventory including the ability to increase inventory levels when required
- Increased availability of motor vehicles and heavy plant fleet, and
- A continuation of improvements to the governance framework for capital investments.

Many of these resource programs and initiatives are already well advanced as evidenced by higher employee levels obtained since Country Energy's formation, and the fact that Country Energy has had no major issue with resource constraints impacting on the delivery of an expanded works program in recent years.

The actions taken to date to meet this increased workload have laid the foundation for developing and procuring adequate resources into the future.

Operating Expenditure

4 Operating Expenditure

4.1 Overview

This section of Country Energy's *regulatory proposal* describes the operating and maintenance costs incurred during the *current regulatory control period*, and efficient expenditure proposals for the *next regulatory control period*.

The remainder of the section is structured as follows:

- Section 4.2 summarises the key provisions of the *Rules* relating to proposed operating expenditure
- Section 4.3 describes Country Energy's operating expenditure during the *current regulatory control period*
- Section 4.4 describes the impact of cost escalation in the *current regulatory control period*
- Section 4.5 provides Country Energy's approach to asset management and demonstrates the soundness of the strategies on which the operating expenditure forecast is based
- Section 4.6 details the key assumptions used in establishing the operating expenditure forecast for the *next regulatory control period*
- Section 4.7 describes Country Energy's methodology in establishing the operating expenditure forecast for the *next regulatory control period*
- Section 4.8 presents Country Energy's operating expenditure forecast for the *next regulatory control period*
- Section 4.9 summarises Country Energy's operating expenditure forecasts for the *next regulatory control period*, and
- Section 4.10 provides concluding comments.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

4.2 *National Electricity Rules* requirements

The *Rules* sets out the general principles that must be reflected in the calculation of distribution network prices. In accordance with clause 6.5.6 of the transitional *Rules*, the *AER* must assess the reasonableness of Country Energy's operating expenditure forecasts.

The information and matters relating to operating expenditure are provided as required by clause 6.1.2 of the transitional *Rules*. In compliance with the *AER*'s *regulatory information notice*, the operating expenditure history and forecasts are also provided in Pro forma 2.2.2.

4.3 Operating expenditure in the *current regulatory control period*

Country Energy's analysis has been based on the available audited regulatory accounts submitted annually to IPART for the first three years of the *current regulatory control period*, plus forecasts for the 2007-08 and 2008-09 years. The 2007-08 estimates have been based on the anticipated expenditure outcome based on eight months' actual expenditure to February 2008 and four months' forecast expenditure. Actual expenditure for the 2007-08 year will be updated during the course of the 2009 *AER's* review process, when the regulatory accounts have been finalised and audited.

During the course of the *current regulatory control period* Country Energy has shown a relatively consistent trend in operating and maintenance expenditure, generally matched to the relevant regulatory allowances. The cumulative expenditure variation over the course of the *current regulatory control period* is expected to be only 0.9 per cent, as shown in Table 4.1 below.

$M (nominal)	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Regulatory Allowance	233	242	294	307	318	1,393
Actual/Estimated	230	242	296	319	317	1,405
Over/(Under) Spend	(3)	0	3	12	0	12

Table 4.1: Operating expenditure for the *current regulatory control period* compared to regulatory allowances

In accordance with clause 6.1.2(7) of the transitional *Rules,* Table 4.2 overleaf shows actual and estimated operating expenditure by category for the previous and *current regulatory control period*, consistent with the categorisation used for forecast operating expenditure for the *next regulatory control period* presented in Section 4.9.

$M (nominal)	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Network Operating Costs	26	31	25	25	30	20	26	27	24	17
Network Maintenance Costs										
- Inspection			9	12	15	10	12	20	24	24
- Pole replacement	8	9	14	11	18	16	11	3	5	2
- Maintenance and repair			16	38	31	32	29	40	48	43
- Vegetation Management	20	22	18	18	24	26	34	42	53	67
- Emergency Response			20	27	34	37	39	51	47	47
- Other Network Maintenance Costs	112	135	30	17	14	49	59	73	77	81
Other Costs										
- Meter reading			8	13	17	17	18	20	20	19
- Customer service			4	7	9	9	10	16	18	13
- Advertising, marketing and promotions			2	1	3	3	3	4	5	5
- Other operating costs			62	47	29	9	0	0	0	0
Total Operating Expenditure	**167**	**197**	**208**	**216**	**223**	**230**	**242**	**296**	**319**	**317**

Table 4.2: Actual and estimated operating expenditure by category driver for the previous and *current regulatory control period*

Country Energy's operating expenditure during the *current regulatory control period* will moderately exceed relevant regulatory allowances. The reasons for this moderate overspend are described below, with input costs a major driver. While Country Energy has been successful in offsetting a proportion of these cost pressures through productivity gains, elements of Country Energy's inspection, maintenance and vegetation control programs have been deferred in response to these significant input cost increases, and an increase in expenditure allowances is required in the *next regulatory control period*.

4.3.1 Materials costs

The *IPART determination* assumed that material costs used to develop operating and maintenance expenditure allowances would remain constant in real terms. However Country Energy has experienced increasing costs due to the global economic upturn and exchange rate volatility – increasing fuel and copper prices in particular.

In addition, Country Energy has been required to instigate substitution of certain materials such as the replacement of hardwood poles with concrete and steel poles and wood cross arms with steel and fibreglass arms, all of which are more expensive alternatives, due to low availability of wood. Further details are provided in Appendix C.

The cost of recovering used oil filled equipment from the field to meet environmental concerns and satisfy EPA requirements, particularly in relation to the testing of polychlorinated biphenyls (PCB) content before transporting, has added costs of the order of $1.2 million per annum.

4.3.2 Contracted services

A number of maintenance activities are externally contracted by Country Energy. This strategy was adopted at a time when the market was very competitive and Country Energy was able to achieve cost savings. With increased market activity and tightening of the labour market, it is not always possible to achieve reduction in costs, even under a competitive arrangement.

In order to ensure that contractors comply with our safety and contractual requirements and achieve the necessary standards, Country Energy adopts a proactive, risk based, audit process, which has also led to an increase in costs.

4.3.3 Labour costs

The *IPART determination* used labour costs to develop operating and maintenance expenditure allowances which were assumed to remain constant in real terms. However Country Energy has experienced an upward trend in labour costs during the *current regulatory control period*.

The ageing workforce and the demand for skilled electricity workers, being driven by significant increases in work volumes in electricity networks across south east Australia, have placed increased upward pressure on labour costs. Other factors such as historic downsizing across the industry in the 1990s in order to achieve operational and technical efficiencies, and the absence of any significant apprentice intakes in that time have compounded this problem.

These factors have resulted in escalated field and technical labour rates reflected in increases in base operating (and capital) expenditure.

In addition, the methodology for allocating technical and business overheads was amended during the *current regulatory period*. Technical and business overheads are now allocated to operating and capital expenditure based on ordinary and overtime labour, rather than the past method which used ordinary labour only. This has resulted in expenditure categories where overtime forms a major component of total expenditure receiving a larger share of technical and business overheads. This is especially the case for the emergency response category.

Country Energy recognised the need to provide competitive rates in the current labour market for recruitment and retention. This is reflected in the recently completed negotiations of the 2007 Country Energy Award. The negotiations have resulted in an increase in Country Energy's base labour costs of 3 per cent per annum for a two year term of the agreement. While recovery of this increase is partially offset by an inflation allowance of 2.5 per cent in the *current regulatory control period*, Country Energy is required to fund the difference.

4.3.4 Recruitment, training and retention

To maintain a sufficiently skilled workforce against an ageing workforce profile, Country Energy has introduced several initiatives during the *current regulatory control period* to mitigate emerging skill shortages. The initiatives address recruitment and training schemes at each of the managerial, professional, technical specialist, trade, and apprentice 'industry induction' levels.

Country Energy has, created more than 670 new apprentice and trainee positions since 2001 and the ratio of apprentices and trainees to the technical employees has increased from 1 to 23, to 1 to 3.6, over the same period. This increase in the intake of apprentices and trainees is designed to replenish and increase the ranks of suitably qualified trades and technical employees and will continue to support the network now and into the future. Forward planning indicates a requirement for maintaining recruitment levels over the *next regulatory control period* with intake levels expected to be in the order of 60 per year.

Country Energy has also introduced a number of retention initiatives. A 'remote area incentive scheme' was introduced in July 2006 to reward experienced employees and aimed to retain important skills in the outback communities and also for attracting new employees to these areas.

4.3.5 Licence conditions

On 1 August 2005, the NSW Minister for Energy imposed additional conditions on Country Energy's operating licence under the *Electricity Supply Act* 1995 (NSW) relating to design, reliability, and performance of electricity distribution networks (*licence conditions*). Following a recent review, these conditions have been replaced with updated and revised conditions, with effect from 1 December 2007.

In order to fully comply with the new *licence conditions*, Country Energy implemented a feeder remediation program designed to improve the reliability performance of selected unsatisfactory feeder segments. However, due to cost pressures arising from other sources, some of these programs including the implementation of powerline corridor vegetation clearing, live line pole top inspection and maintenance, and an annual helicopter inspection of poor performing feeders have been deferred.

The program to be implemented is detailed in Country Energy's Reliability, Quality and Security of Supply Management Plan contained in Country Energy's *NAMP* (refer to Appendix E).

These requirements have also led to an increase in resources for reporting, investigating and implementing the reliability improvement initiatives.

4.3.6 Workplace safety

During the *current regulatory control period*, Country Energy made the decision to invest heavily in improving our safety culture and performance. This has resulted in substantial improvements throughout all aspects of safety performance, to the point where Country Energy's statistics are now comparable to other NSW *RNSPs*, albeit at additional costs.

Country Energy also provides a safety allowance as additional incentive to ensure the safety of individual employees. Breaches of safety requirements can result in the loss of the allowance for a period of time, depending on the severity of the incident. Since its introduction in 2005, significant improvement in lost time injuries has been recorded, improving productivity and health of employees.

4.3.7 *Insurance premiums*

Country Energy, in conjunction with its insurance broker, undertakes an annual review of its insurance requirements in order to determine the insurance cover for various categories of significant risk and the levels of self insured retention. Increases in insurance premiums have outstripped inflation and are expected to increase into the future due to tightness in insurance market.

4.3.8 *Vegetation management*

In the past vegetation was managed to achieve basic clearance requirements to ensure that in hazardous bushfire risk areas the clearance space was maintained at all times during the fire season. The total forecast spending in the *IPART determination* for vegetation control was around $25 million per annum.

However increases in expenditure have occurred in order to maintain clearance in bushfire prone areas more generally and community expectations for tree clearing in sensitive areas, which has added costs due to more careful 'envelope' tree clearing. Other specific changes which have been incorporated into the revised vegetation practices and policy include:

- Improved records of vegetation and tracks for more efficient control and planning
- Improved records relating to the location of significant vegetation
- More extensive trimming in urban areas
- More extensive clearing of rural areas
- More efficient access track maintenance to ensure access at all times for routine maintenance and emergency restoration work, and
- More extensive trimming to maintain a clearance space around insulated cables.

Further, the unit rates applied for vegetation works, at the time of the *IPART determination*, were derived from minimal historical data. Accordingly, there has been a significant increase in vegetation management expenditure over the *current regulatory control period* compared to the forecast included in the *IPART determination*.

4.3.9 *'Live line' work*

While 'live line' work techniques are suitable to particular maintenance tasks, their application has increased in order to reduce supply interruptions, particularly on radial subtransmission and rural feeders, and hence improve the overall reliability of supply to customers. These activities are more costly than de-energised line work because of the specialised equipment required, rigorous testing required and the specialised training.

4.3.10 *Compliance costs*

The *current regulatory control period* has seen the introduction of many new and enhanced regulations governing asset operation and maintenance that have increased compliance management, auditing and reporting costs, and occupational health, safety and environmental costs. The costs associated with these new requirements are incremental to the forecast expenditures in the *IPART determination*.

Requirements relating to traffic control is an example, where works are now affected by the requirements of the Roads and Traffic Authority that place specific requirements on electricity distributors when construction, vegetation clearance and maintenance works are conducted on the roadway, shoulder or pathway.

There is also the cost associated with loss of productivity from changed work practices. The implementation of safe working procedures has slowed down the rate of work to reduce the health and safety risks to employees and the community. The training and appropriate skilling of employees, and the implementation of an ongoing health assessment program have also increased costs.

Country Energy has been required to implement additional environmental compliance requirements since the *IPART determination*. Country Energy has developed a comprehensive suite of policies, procedures and safe work method statements to meet these obligations. The management and disposal of asbestos has been the focus of considerable attention. This has required Country Energy to change management practices or upgrade facilities for the management, storage and removal of equipment containing asbestos.

Other additional costs include the development and management of the policies and plans to ensure employees and others in the vicinity of any works are not put at risk. This includes instruction, training, protective clothing (including its disposal), and use of specialised equipment.

4.3.11 Ageing assets

Maintenance costs have increased over the *current regulatory control period* due to the need to maintain ageing assets that would not have been reflected as incremental rate of change in real costs in the regulatory allowances. This is due to higher failure related costs and the need for more inspection, condition monitoring and maintenance.

4.3.12 Security

Country Energy has implemented a number of initiatives to improve security of critical infrastructure across the organisation. Country Energy undertook a major internal review and engaged security consultants to review the new obligations and its impacts, to identify any gaps in its current security arrangements. The reviews were focussed on assets with higher risk profiles.

4.3.13 Field service centres

Operating expenditure levels provided in the *IPART determination* did not adequately consider the level of operating expenditure necessary to maintain our field service centres in order to meet day to day service provision, or the accommodation expansion required to house the significant increased levels of employees.

In order to address these deficiencies, Country Energy has invested heavily in revamping existing centres to ensure compliance and opened new centres to cater for increased employee levels. In some cases it was more cost effective to move to a green field site and establish a new centre rather than revamp the old facilities. During the *current regulatory control period*, Country Energy introduced two new office buildings and carried out major refurbishments or relocations of several field service centres. In addition, new building or major refurbishments are also planned for 13 of its field service centres in the remainder of the *current regulatory control period*.

4.3.14 Demand management administration

There has been an increase in applications received from demand side participants and from embedded generators including wind energy generators. A list of Country Energy's demand management projects and trials are attached at Appendix N. While demand side activities form an important part of Country Energy's network planning processes, this increased involvement has led to additional costs being incurred, including:

- in the case of suppliers of non network or demand side projects, as an alternative to network solutions, there has been increasing requirements in terms of the commercial and technical administration of this process associated with investigation of potential projects proposed by proponents, and
- in the case of embedded generation projects, in addition to the provision of the necessary network connection infrastructure with those that proceed, there is additional connection planning, derivation of generator connection charges, commercial negotiations, and other related work arising including the need for greater liaison with regulatory authorities, associated with investigation of potential projects initiated by proponents under Chapter 5 of the *Rules*.

4.3.15 *Supporting the competitive retail market*

The electricity distribution network business has been required to maintain an increasing amount of information such as customer billing histories, consumption histories, and network price data for the benefit of other Network Electricity Market participants. This has resulted in additional costs associated with the collection, management, and provision of data relating to customers on market contracts and the relationships with energy retailers and market information systems.

4.3.16 *Enhanced metering services*

The electricity distribution network business is exclusively responsible for metering services for meters of type 5-7 (excluding remotely read meters), which have been classified in the *IPART determination* as prescribed services.

The cost of providing meter data services including meter reading and meter data processing has increased over and above the cost provided for in the *IPART determination*. The cost of developing and enhancing systems to manage the increased level of meter data has also increased.

In addition it has become necessary under the regulations to read all meters quarterly, many of which traditionally were only read annually because of the large travel distances involved. This has resulted in a significant rearrangement of meter reading work load.

In the past maintenance for types 5 and 6 meters was generally given a low priority. During the *current regulatory control period*, as a requirement to support full retail competition, new metering plans, policies and work practices have been developed including the implementation of:

- in situ sample testing to determine accuracy
- inspection and testing of low voltage current transformer metering installations
- program of upgrading and standardising current transformer metering and wholesale metering
- refurbishment where required
- installation of new meters when existing meters are due for, or require, replacement, and
- external testing and certification.

4.3.17 *Information technology*

There have been a number of new information technology applications or additional functionality introduced in *current regulatory control period* that have resulted in material changes in operating costs. These have led to increased requirements for additional employees to manage the related processes, and contracted support from the vendor for information technology support service and maintenance. Information technology maintenance cost has also increased as a result of the growth in servers and computers.

4.3.18 *Taxation*

Since the *IPART determination*, Country Energy is required to pay land tax. In the case of leased properties, contract rates are usually structured with land tax as a pass through to the lessee. During the *current regulatory control period*, property values in NSW have increased sharply, resulting in an increased liability for land tax. The payment of land taxes and the increase in land values was not factored into the *IPART determination*.

4.3.19 *Customer claims*

During the *current regulatory control period*, Country Energy experienced an increase in number of customer claims for electrical appliances and other equipment which have been damaged as a result of possible quality of supply issues. As a result, Country Energy is expecting to increase the current level of maintenance to minimise the potential for damage.

4.3.20 Australian Inland

In 2005 Country Energy merged with the former Australian Inland. A review of the operational and maintenance work practices and performance of the former Australian Inland was conducted. The review identified a number of integration issues that needed to be managed as a priority to introduce consistency with the rest of the organisation. The regulatory allowances provided by IPART were not representative of the expenditure levels required to actually maintain Australian Inland's network.

Country Energy introduced process improvements and addressed deficiencies during the integration, including:

- Reviewing the quality and extent of asset information and works management systems, phasing out of legacy systems, conversion of asset data, introduction of GIS and SCADA
- Enhanced asset inspection and condition assessment programs including determining the optimum inspection and maintenance cycle, and vegetation control, and
- Better works programming, budgeting, business reporting and general performance management, including integration of the customer data base and payroll.

The former Australian Inland is now fully integrated into Country Energy and no separate expenditure has been identified for the *next regulatory control period*.

4.4 Cost impacts

Country Energy has absorbed or mitigated a proportion of cost increases in *current regulatory control period.* However, at the same time there has been an increasing need to spend additional capital for the construction of critical infrastructure, as detailed in Section 5 of this *regulatory proposal*.

As a result, on a relative basis, fewer resources have been available for operating and maintenance activities, placing more pressure on the asset inspection, vegetation control, and maintenance programs. This has led to the deferral of elements of the asset inspection, vegetation control work, and maintenance programs.

Country Energy has implemented a new strategic approach and plan for asset inspection, vegetation control, and maintenance work beginning in the 2007-08 financial year and moving forward into the *next regulatory control period*. The deferred and backlog maintenance work program will require an expenditure increase in the *next regulatory control period*, in order to maintain the safety and security of the network and to ensure service reliability and quality does not deteriorate. This new approach and plan is detailed in the next section.

4.5 Asset management approach

Planned asset inspection, vegetation control, and maintenance work programs are fundamental to the processes of effective total asset management and are key elements of Country Energy's overall planning cycle. Implicit in these activities is the linkage between overall corporate objectives, distribution services performance objectives and strategy, and the *NAMP*.

The purpose of asset inspection, vegetation control and maintenance planning is to provide a safe network, maintain the condition of system assets, reduce the incidence of premature failure, enable assets to operate more safely and reliably, preserve and enhance the operational life of the assets, meet service objectives and compliance obligations, while reducing the demand on expenditures.

The maintenance of ageing in service assets becomes more resource intensive over time due to the decline in the condition of the assets. The result is an increase in the inspection and maintenance expenditure to maintain the serviceability of the asset. Accordingly, attention to the risk and cost of inspection and maintenance is an essential and significant part of the total management of an organisation's assets.

Country Energy is highly committed to realising a safe, high quality, reliable and economic electricity supply to its customers. In the past, Country Energy's approach to asset inspection, vegetation control, and maintenance was based on historical work programs, limited by locally available resource constraints.

Country Energy now adopts more formal risk assessment techniques to develop strategic asset management plans and maintenance work programs, whilst still applying industry accepted maintenance best practices.

Country Energy has developed a zero based model – RISMO – to assess current inspection and maintenance risk levels. This more formal approach to asset management adopted by Country Energy has enabled it to identify and rank inspection, vegetation control, and maintenance related work activities by asset class, for each individual region and across the entire network. The model determines the relative allocation of resources (both physical and financial) between and within various work programs. This will also ensure an efficient use and prioritisation of limited resources across the regions and the entire network.

Country Energy has also applied a more thorough vegetation control planning approach, involving the use and analysis of vegetation density profiling.

The end result has been the development of a strategic asset inspection, vegetation control, and maintenance plan and work programs, based on risk management techniques. Details are provided in the sections below.

4.5.1 Network Asset Management Plan (NAMP)

Country Energy's work programs and expenditure forecasts are derived from its comprehensive *NAMP*. The *NAMP* provides Country Energy's corporate and service delivery objectives, safety and maintenance compliance obligations, and the associated asset management policies, strategies and plans. It reflects recognised industry best practices relating to the management of infrastructure assets and conforms to the NSW Government's Total Asset Management (TAM) framework. The *NAMP* takes a long term view on how Country Energy intends to manage its assets.

The *NAMP* provides a comprehensive overview of the condition of network assets and specifies reliability, security and availability targets. The *NAMP* identifies strategic plans for capital investment for augmentation, asset renewal, reliability and quality of supply improvement, and asset inspection, vegetation control and maintenance over the planning horizon.

Country Energy has developed asset management practices, asset inspection, vegetation control, and maintenance policies, procedures and guidelines for employees to support organisational objectives and the *NAMP*. The preparation of the Asset Maintenance Management Plan contained in the *NAMP* and the associated asset inspection, vegetation control, and maintenance work programs are in compliance with the requirements of the relevant Acts, regulations, and the related codes of practice.

At the forefront of the *NAMP* is the development of a strategic asset inspection, vegetation control, and maintenance plan and work programs based on risk management techniques. This involves the implementation of new inspection, vegetation control, and maintenance works, the implementation of deferred maintenance programs, and the consolidation of defect maintenance backlog over the *next regulatory control period* to ensure optimum performance, risk mitigation, and the most efficient use and prioritisation of scarce resources across the entire electricity network.

A copy of the *NAMP* is attached at Appendix E.

4.5.2 Legislation, Regulations and Codes of Practice

The standards to which the electricity network must be constructed, operated and maintained are contained in a number of Acts, regulations, and codes. The main legislative and regulatory instruments that impact on the operation and maintenance of Country Energy's distribution network include:

- *Electricity Supply Act* 1995 (NSW), and its *Regulations,* Country Energy's *licence conditions* under that Act, and various requirements of the NSW Department of Water and Energy (DWE)
- *Electricity Supply (Safety and Network Management) Regulation* 2002 (NSW)
- *National Electricity Law* and *National Electricity Rules*
- Relevant *IPART determinations*
- *National Electricity Network Safety Code*, and
- *Occupational Health and Safety Act* 2000 (NSW) and its *Regulations.*

Country Energy also complies with various industry codes of practice under relevant regulations, in particular:

- *National Electricity Network Safety Code (NENS 01)* requires that all electricity works must be designed, constructed, maintained and operated to ensure safety to persons and reliability of supply, taking into account the associated risks.
- *NSW Code of Practice - Demand Management for Electricity Distributors* sets out the required processes to be followed when evaluating strategies for the development of electricity supply, including open and competitive planning and assessment processes to address network limitations.

Country Energy is also bound by the *Rules* to consult with interested parties on the possible alternatives to major distribution network developments.

The preparation of the *NAMP* and the associated work programs has been undertaken in compliance with these requirements.

As the owner and operator of distribution assets in Queensland and Victoria, Country Energy must also comply with additional statutes applicable to Queensland and Victoria, including:

- *Electricity Safety Act* 1998 (Vic), *Electricity Safety (Network Assets) Regulations* 1999 (Vic), *Electricity Safety (Electric Line Clearance) Regulations* 1999 (Vic), *Electricity Safety (Bushfire Mitigation) Regulation* 2003 (Vic)
- *Electricity Act* 1994 (QLD)
- *Environmental Protection Act* 1994 (QLD), and
- *Electricity Safety Act* 2002 (QLD) *and Electrical Safety Regulation* 2002 (QLD).

This suite of legislation and codes places significant compliance demands on Country Energy. Country Energy's overall occupational health and safety compliance obligations cover a broad spectrum of workplace activities including, but not limited to:

- Requirements for line workers working at heights both on poles and substations
- Requirements for line workers working near live overhead powerlines and underground cables
- Requirements for qualified employees at worksites
- Requirements relating to low voltage live line working
- Requirements relating to traffic control
- Training requirements for accredited service providers, and
- Health assessment.

Electrical safety compliance obligations – Compliance obligations include, but are not limited to:

- Bushfire management and prevention
- Asset management requirements
- Asset inspection and testing regime including earthing
- Electricity powerline clearances including conductor heights
- Inspection requirements for private electricity powerlines
- Navigable waterway crossings, and
- Customers' electrical connection equipment and installation.

Environmental compliance obligations – Country Energy is required to comply with legislated environmental compliance requirements relating to the decommissioning of network assets, for the removal and disposal of hazardous materials and chemicals such as asbestos and equipment containing PCB, oil management, and clean up of land parcels affected by chemical usage and waste disposal practices.

Reliability performance licence conditions and standards – In order to fully comply with its *licence conditions*, Country Energy has implemented a suite of incremental maintenance and vegetation control initiatives that has formed part of an annual comprehensive feeder remediation program designed to improve the reliability performance of selected unsatisfactory rural feeder segments.

4.5.3 Risk management

A key component of the *NAMP* is risk management. Country Energy pays particular attention to risk management and its relationship to network asset safety and reliability performance. This is reflected in RISMO.

Country Energy has adopted *ESAA C(b)1-2003 Guidelines for Design and Maintenance of Overhead Distribution and Transmission Lines* and *AS/NZS 4360:2004 Risk Management* to perform risk based assessments. This ensures that risk, duty of care and reliability drivers are incorporated into asset life cycle cost decisions. The process involves undertaking a risk review, quantifying risk, and applying appropriate risk control measures.

All asset inspection, vegetation control and maintenance work practices have been reviewed to ensure they do not reflect unnecessarily conservative precautions and are based on best practice risk management and statistical principles.

4.5.4 *The need for asset inspection and maintenance*

Country Energy's inspection and maintenance program includes the following recurring requirements:

- Pole and powerline inspection and maintenance
- Subtransmission and zone substation inspection, condition monitoring, maintenance and protection testing
- Distribution substation condition monitoring and maintenance
- Distribution equipment condition monitoring and maintenance
- System earthing testing and maintenance, and
- Vegetation management and control.

These programs are developed to hold asset condition and network performance at the desired level of performance and risk. They are required elements of the bushfire mitigation compliance requirements.

Inadequate inspection and maintenance can lead to an increase in unplanned corrective maintenance, premature failure and costs. Unplanned maintenance costs are generally much higher than the cost of planned maintenance due to inefficient use of resources. Inadequate maintenance can also lead to higher long term asset replacement investment.

4.5.5 *Asset inspection and maintenance planning, strategies and policies*

The development of sound asset inspection and maintenance strategies are fundamental for prioritising and efficiently allocating expenditure to programs that will lead to maintaining and/or improved network performance in a safe and environmentally responsible manner. In terms of the intended inspection and maintenance expenditure program for the *next regulatory control period*, Country Energy's key strategies are contained in the following plan.

- *Asset maintenance management plan*

  The implementation of asset inspection, condition monitoring, vegetation control, and maintenance strategies for each asset class is crucial to the ongoing efficient and effective operation of the network. This plan correlates and quantifies these requirements and ensures appropriateness for the overall portfolio management strategy to meet organisational objectives.

  The most appropriate strategy for network assets will depend on the type of asset to be inspected and maintained, the consequences of breakdown or non performance of the asset, and the availability of resources to execute the maintenance.

  Country Energy has adopted a number of industry accepted maintenance practices to identify asset defects to be rectified. They comprise various combinations of:

  - *Periodic inspection and maintenance* – this work practice involves undertaking inspection, vegetation clearing, and maintenance work on a fixed time basis. This type of work practice is appropriate for asset classes where condition based maintenance cannot be applied. The 4.5 year inspection and maintenance cycle for poles and overhead distribution powerlines is a good example.
  - *Condition based maintenance* – from ongoing asset condition monitoring programs, where parameter measurements of equipment are taken, it is possible to measure deterioration, determine when maintenance is required, or plan for replacement before failure occurs. This work practice is usually applied to high value equipment, such as power transformers and zone substation equipment and other high cost distribution equipment. An example is the taking of oil samples for dissolved gas analysis (DGA) to indicate internal insulation failure.
  - *Preventative maintenance* – this work practice involves undertaking maintenance to prevent or minimise deterioration of equipment in service or halt any decay in progress.

Country Energy's annual maintenance plan and budget is derived from the application of these different strategies to each of the asset groups. The annual maintenance plan is supplemented by an extensive capital works program focussed on replacing or refurbishing zone substation equipment and other powerline and distribution assets primarily based on condition.

Quantification of the effort required to implement the plan was modelled using RISMO. This work ensures that Country Energy's maintenance plan and budget are carried out at the most efficient and effective level.

While live line work techniques are suitable to particular maintenance tasks, its primary application is for reducing planned outages. These activities are more costly than de-energised line work because of the specialised equipment required and the training involved.

Country Energy strongly believes that its asset management strategies and maintenance work practices are prudent for the current state of the network and meet efficient maintenance requirements.

- *Bushfire risk management planning*

  The *Electricity Supply (Safety and Network Management) Regulation* 2002 requires Country Energy to prepare a Bushfire Risk Management Plan. The objectives of the Bushfire Risk Management Plan are to:

  - Ensure public safety
  - Establish standards for vegetation management near powerlines, particularly in bushfire prone areas
  - Minimise the possibility of fire ignition due to powerlines and associated equipment
  - Minimise any other adverse impact of powerlines on vegetation, and
  - Ensure a balance between bushfire risk management, vegetation management and the provision of a safe, reliable and adequate supply of electricity of appropriate quality.

  Prior to October of each year either aerial or ground inspections are carried out on all powerlines in bushfire prone areas. In addition to the annual bushfire mitigation patrols, vegetation control is carried out on a one to three year cycle depending on regional vegetation growth rates. Pole and powerline inspections are carried out on a 4.5 year cycle. Other equipment is also routinely inspected.

  The purpose of bushfire mitigation patrols is to identify any factors associated with overhead powerlines that could lead to fire initiation, including inadequate vegetation clearances, impact damage, lightning damage or other defect. Country Energy carries out remedial work to rectify these defects.

- *Integrated regional network planning, budgeting and works programming*

  Network planning ensures an optimal balancing of capital and recurrent expenditure, so that maintenance, replacement and augmentation of the network deliver the required level of services at the lowest possible cost.

  Country Energy's Network and Infrastructure strategy management group is responsible for the overall management of the asset inspection and maintenance process including policy and strategy development, maintenance plan development, process measurement, and process improvement.

Country Energy's regional network planning groups are responsible for the development, implementation and completion of efficient work programs and budgets based on the inspection and maintenance requirements of the *NAMP*, the standard organisational wide policies and procedures, asset condition and defects, complimented by local regional requirements relating to customer driven needs and the state of the local network.

Country Energy's asset management systems record all assets, their location, condition data, and defects as assessed. These defects are prioritised, graded, and rectified as planned work within a specific time cycle, in accordance with accepted industry practice.

- *Policies and Procedures*

  Country Energy's inspection and maintenance management strategy provides the basis for the development of inspection and maintenance procedures for each equipment category.

  Country Energy has an extensive list of asset inspection, condition assessment, vegetation control, and maintenance policies and procedures in place. These policies and procedures detail the inspection, maintenance tasks and criteria for each major asset class and provide practical guidance on all associated activities.

- *External contracting*

  Country Energy utilises a mixture of internal and externally contracted labour resources to undertake asset inspection, vegetation control, and maintenance. Country Energy has struck a balance between the use of internal technical expertise and contracting external services in order to retain ongoing knowledge of both the condition and maintenance requirements of the assets.

  Internal resources are generally retained for core maintenance, fault finding and repair functions. This resource has been multi skilled and developed to cover a range of functions in managing a rural electricity network.

  In many cases, internal resources are supplemented to handle peak work demands. There are a number of contracts in place for externally contracted services including:

  - Asset inspection
  - Aerial inspection
  - Vegetation control
  - Zone substation maintenance
  - Property maintenance
  - Meter reading, and
  - Supplementary maintenance support as required.

  Quality checks are made via the contractors' reports, from actual work undertaken, and by Country Energy employees who supervise the work.

- *Key asset maintenance challenges for the future*

  There are a number of issues that have been identified by Country Energy that need to be addressed as a priority for the remainder of the *current regulatory control period* and moving forward into the *next regulatory control period.*

The ongoing challenge for Country Energy is to meet its service and compliance obligations and to make reliability, quality and security of supply enhancements in an environment where future work undertaken on the electricity distribution network will need to be biased towards asset condition, addressing network safety and environmental issues and reducing the potential risk of an ageing asset profile. Country Energy must also continue to meet customer service, growth and security requirements, while achieving the necessary balance with increased expenditure and efficiencies already obtained.

Country Energy recently undertook a detailed review of its asset inspection, vegetation control, and maintenance work practices. Risk assessment techniques were applied to develop new strategic asset maintenance plans and inspection and maintenance work programs to ensure that issues that may adversely impact on public and employee safety, supply interruption, and environment are identified, assessed, and mitigated to acceptable levels. The outcome of this review is explained in detail from Section 4.7.

4.6 Key assumptions

This section provides an overview of the key assumptions underlying the operating expenditure forecasts that have been certified in accordance with provision S6.1.2(6) of the transitional *Rules* (refer to Appendix B).

Further details on these key assumptions are covered throughout Section 4 and Pro forma 2.3.3.

4.6.1 Efficient base year

Country Energy has used the 2006-07 financial year as the base for forecasting future costs. The 2006-07 year is the latest year where actual audited regulatory accounts are available.

Country Energy has a commercial incentive to achieve an efficient level of expenditure, while meeting service expectations and regulatory obligations, recognising the non discretionary nature of a high proportion of expenditure.

Country Energy believes that its 2006-07 operating and maintenance expenditure outcomes provide an efficient base level from which to forecast future expenditure requirements.

4.6.2 Growth

Most of the forecast operating and maintenance expenditure is associated with the existing asset base. However growth related capital expenditure increases the size of the network and the number of assets to be maintained, operated and managed. Accordingly, there is a need to establish a relationship between demand growth and real increases in operating and maintenance expenditure.

Country Energy recognises that operating expenditures increase with capital expenditure. Country Energy has increased its network related operating expenditure by the proportion of average annual growth related capital expenditure over the total replacement cost of regulated distribution assets. This ratio is then reduced by 25 per cent to reflect that new assets will not immediately require condition based asset maintenance.

4.6.3 Licence conditions

On 1 August 2005, the NSW Minister for Energy imposed additional conditions on Country Energy's operating licence under the *Electricity Supply Act* 1995 (NSW) relating to design, reliability, and performance of electricity distribution network (*licence conditions*). Following a recent review, these conditions have been replaced with updated and revised conditions, with effect from 1 December 2007.

The purpose of the *licence conditions* is to facilitate the delivery of a safe and reliable supply of electricity and ensure that satisfactory levels of performance are achieved for all customers. Country

Energy recognises that the *licence conditions* encourage the achievement of improved levels of service performance for all customers, and for those customers connected to the lowest performing feeders.

The *licence conditions* have a strong bearing on specific asset management strategies. Expenditure forecasts have been derived from rigorous and detailed analysis models of the required reliability improvements, including statistical modelling and feeder segmentation.

4.6.4 Cost escalation

Material and labour cost increases have been strong in the *current regulatory control period* and this is expected to continue into the future. Country Energy engaged Competition Economists Group (CEG) to research and provide escalation trends in labour and material costs for the current and future *regulatory period* (refer to Appendix C).

Country Energy has calculated a weighted average real increase in labour and material costs used to develop the operating expenditure forecasts of approximately 1.5 per cent, excluding vegetation management costs. The weighted average real increase in labour and material costs used to developed vegetation management forecast is approximately 2.4 per cent.

4.6.5 Network Asset Management Plan

Asset management covers the processes for planning, development, operation, inspection, condition assessment and maintenance of all components of the electricity network. The establishment of sound asset management system and processes are a prerequisite for prudent and efficient capital and operating expenditure.

Country Energy prepared the *NAMP* as a means of strategically managing physical system assets to best support the delivery of network services to all connected customers over the planning horizon to 2013-14. It describes the asset management policies, strategies, plans and practices of Country Energy. The objective of the *NAMP* is to maximise the technical and financial performance of the network for all stakeholders and to consistently provide customers with high quality, safe and reliable network services, at the lowest possible price, while preserving the value of public assets.

4.6.6 Risk management

Country Energy's operating expenditure forecasts are designed to cost effectively manage risk through a cost reflective maintenance program to maintain asset condition from major substations to home service mains and meters. Project and program expenditure needs to grow in proportion to risk.

New strategic plans and work programs have been developed, based on risk management techniques. Expenditure forecast has been derived from RISMO for asset inspection and maintenance. Country Energy engaged SAHA International to undertake an independent review and confirmation of RISMO's compliance with *AS/NZS 4360:2004 Risk Management.*

Country Energy has also applied a more thorough vegetation control planning approach, involving the use and analysis of vegetation density profiling.

4.6.7 Self Insurance

Self insurance is a significant legitimate cost that needs to be recognised in operating expenditure considerations. It is common for companies like Country Energy to carry a level of self insurance to account for situations where either certain risks cannot be insured through market based insurance policies or where self insurance is more cost effective.

A comprehensive report has been prepared by SAHA International demonstrating the risks we will self insure and the quantum of self insurance included in our operating expenditure forecasts.

4.6.8 Debt and Equity Raising Costs

The *Rules* require a benchmark approach to determining the debt and equity raising costs. An independent report has been prepared by CEG to support the forecasts for these costs (refer to Appendix I). Further details of Country Energy's debt and equity raising costs are provided in Section 4.8.10.

4.7 Forecast operating expenditures – methodology

A key issue for Country Energy is the establishment of future expenditure allowances to ensure that sufficient resources are available to meet its particular obligations in delivering safe and reliable network services to customers.

Country Energy faces the twin challenges of ageing infrastructure, and expected improvements to security and reliability arising under its *licence conditions*. These factors have provided considered input into the development of our work programs and highlight the importance of ensuring that sufficient expenditure is provided to maintain the integrity and safety of the network and to maintain and deliver an improved level of service.

Country Energy is proposing that the operating and maintenance activities for the *next regulatory control period* would be undertaken in accordance with the services outlined in Section 3 of this *regulatory proposal*.

Country Energy is seeking a sustainable increased level of expenditure in its regulated distribution network price path in order to provide the resources for the implementation of its intended works program. Country Energy intends spending $408 million in the 2009-10 financial year in relation to the provision of *standard control services*, increasing over the *next regulatory control period* with network growth and labour and materials cost escalation. The average annual operating and maintenance spend represents some 3 per cent of the total asset replacement cost of all system assets.

Country Energy is committed to delivering an operating and maintenance program that will result in a safe and efficient, reliable, affordable and sustainable service. Country Energy has prepared a resource capacity plan that demonstrates our capability to deliver the forecast levels of operating expenditure. Country Energy endorses an approach where capital and operating and maintenance expenditure are assessed together.

4.7.1 Forecasting an efficient level of future expenditure requirements

Country Energy's estimates of future operating expenditures result from planned changes in the scope of relevant distribution maintenance activities, and have been derived through careful and reasoned analysis of the causes of those changes. It has been necessary to consider the expected increases in costs associated with the implementation of incremental work programs. While historical data has value, it is essential that each *regulatory period* be considered separately in light of the services to be delivered and outcomes to be achieved.

Key assumptions for expenditure forecasts have been the 2006-07 efficient base year costs, and the use of a zero based modelling (RISMO). The 2008-09 financial year planning process entailed a detailed review of objectives, strategies, activities, and future resource levels of the distribution business for the remainder of the *regulatory period* and beyond. During this process, consideration was given to the regulatory expenditure allowances and the actual spends from the audited regulatory account returns.

A broad 'bottom up' methodology has been used by Country Energy to establish its forecasts of efficient operating and maintenance spending for the *next regulatory control period.* This incorporates current 'business as usual' operating and maintenance programs.

Adjustments to operating and maintenance expenditure for strategic inspection, vegetation control and maintenance programs include:

- Implementation of new asset inspection and maintenance work programs based on risk assessment as detailed in Section 4.8.1
- Implementation of a program to eliminate the backlog of asset inspections, testing, and risk defect maintenance as detailed in Section 4.8.2
- Implementation of a program for those parts of the asset inspection, vegetation control, and maintenance work programs and individual reliability improvement programs that have been deferred in the *current regulatory control period* as detailed in Section 4.8.3, and
- Adjustment for incremental real cost impacts arising from growth in the network, real wage and material cost increases, productivity and capital expenditure tradeoffs as detailed in Section 4.8.4.

This approach to forecasting operating and maintenance expenditure requirements is consistent with sound planning practices and enables a lighter handed approach, focussing on differences from current 'business as usual' costs rather than a detailed analysis of all costs.

4.7.2 Expected changes in recurrent operating and maintenance expenditure

Country Energy has identified that it will need to significantly increase its asset inspection, vegetation control and maintenance expenditure for the 2009-10 financial year and beyond.

Country Energy has sculpted the implementation of these activities over a number of years based on an acceptable level of risk. The additional maintenance activity will be split between permanently employed employees and external contractors in order to achieve maximum economy.

Country Energy believes its inspection and maintenance policies and work programs are sound and in accordance with current industry best practice for an electricity distribution network with an ageing, diverse and extensive network asset base. The policies and work programs are necessary for the safe operation of the network and for risk mitigation purposes. Country Energy contends that this program is essential and is detailed in the following sections.

4.7.3 Development of strategic maintenance plans based on risk assessment

In the past, the asset inspection, vegetation control, and maintenance work plans across the regions were generally based on historical expenditure. With competing and constraining resources in the industry and within Country Energy, a risk assessment methodology was needed for the development of these programs.

Country Energy reviewed in detail all its inspection, vegetation control, maintenance and renewal management policies, procedures, and practices. At the same time, new strategic plans and work programs have been developed based on risk management techniques, to ensure that inspection, vegetation and maintenance issues relating to system assets, which may adversely impact on public and employee safety, supply interruption, financials, exposure to litigation, environment, and reputation are identified, assessed, and mitigated to acceptable levels in the period to 2013-14. This approach is sound and accords with current good industry practice for a distributor with an ageing, diverse and extensive network.

The risk assessment process was undertaken in various stages as outlined below:

1 Identification of all asset inspection, vegetation control, and maintenance work tasks for all asset classes and all equipment/component types based on current policies and procedures.

2 Through an extensive audit of each region the current situation in respect of each eligible work task was classified as fully implemented, partially implemented, not performed, or not relevant to a particular region or the whole of the network.

3 A detailed risk assessment of each asset class was then conducted including criteria such as customer impact, safety, replacement cost, environment and compliance. Individual asset class risks were then modified further by consistently applying probability, priority, age and activity stream.

4 A table of all eligible work tasks was then produced to determine the relative risk reduction capability of each work stream with consideration of the required effort.

5 Development of a preferred work plan based on the risk assessment of new work tasks and work tasks based on existing policies and procedures.

6 Identification of the incremental resource requirement involving the derivation and assignment of unit rates (using standard labour, materials and plant costs) and quantities for each work task to quantify the financial impact of implementing the preferred work plan.

7 Identification and quantification of deferred inspection, maintenance and vegetation control work for tasks not currently fully performed in accordance with existing plans, policies and procedures.

8 Identification and quantification of the deferred defect maintenance.

9 Refinement of the asset maintenance plan, policies and procedures detailing the new strategic approach and the preferred work plan.

The model provides the core elements for development of a comprehensive zero based budget to encompass the aggregation of individual work tasks across all regions and the development of costs in accordance with the preferred work plan.

RISMO was developed for the purpose of integrating the above. Country Energy has engaged SAHA International to undertake an independent review and confirmation of RISMO's compliance with *AS/NZS 4360:2004 Risk Management*.

4.7.4 Vegetation density profiling

Country Energy has integrated a vegetation density profile into its geographical information system for the purpose of risk prioritisation, developing more efficient practices, estimating vegetation growth rates and control cycles, and general planning of the vegetation program including estimating future expenditure requirements.

Foliage density data with a density band ranging from 1 to 10 for a 60 metre wide buffer along the entire length of Country Energy's overhead powerline network was obtained from the Department of Environment and Climate Change and imported into our geographical information system. This classification was then further categorised into three broad vegetation density profiles sparse, medium and heavy. Unit costs were then developed for each broad profile for a full corridor clearing approach for reliability improvement purposes and for routine safety 'envelope' clearance.

The model also provides for the ability to analyse vegetation issues by running queries for poor performing feeders, field service centre area, feeder category, region area, designated bushfire prone areas, total network or any other GIS area object.

Corresponding lengths of overhead powerline for each vegetation density band is generated and, combined with the unit cost rates, can be used for expenditure forecasting for a variety of different programs or options, and enables more efficient planning.

Figure 4.1 shows an output from this model for a typical heavy vegetation profile. Figure 4.2 plots the vegetation density against the corresponding lengths of overhead powerlines for each Country Energy region.

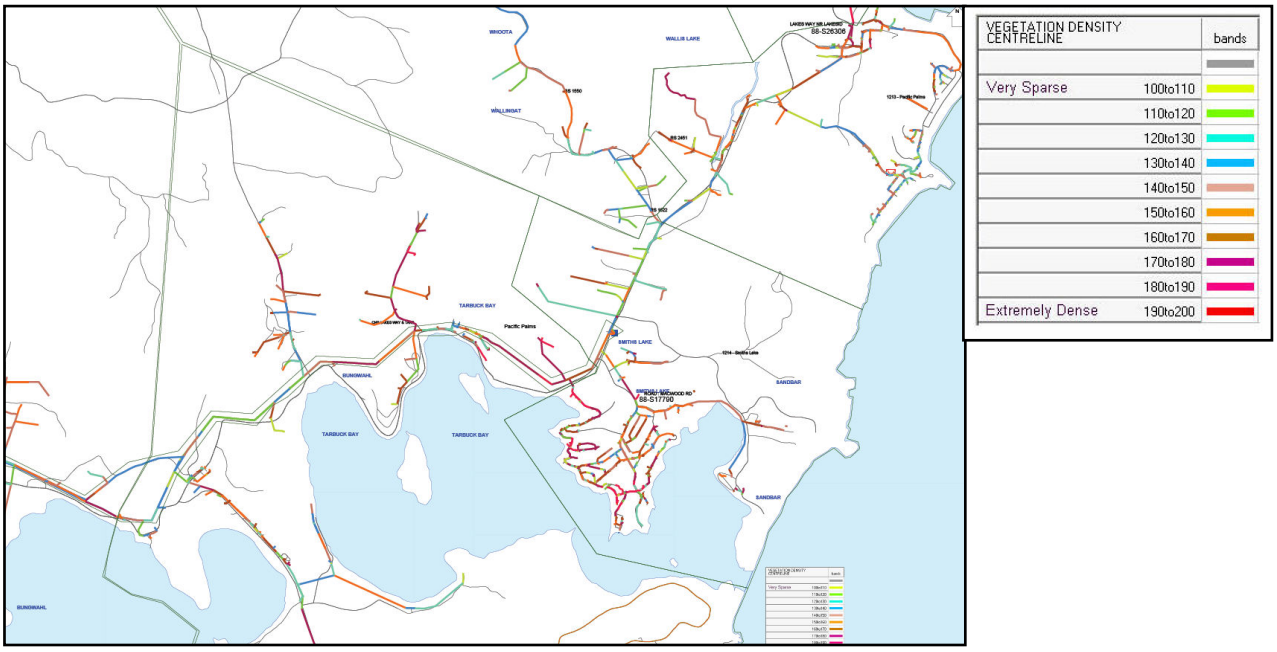

Figure 4.1: Example of heavy vegetation profile

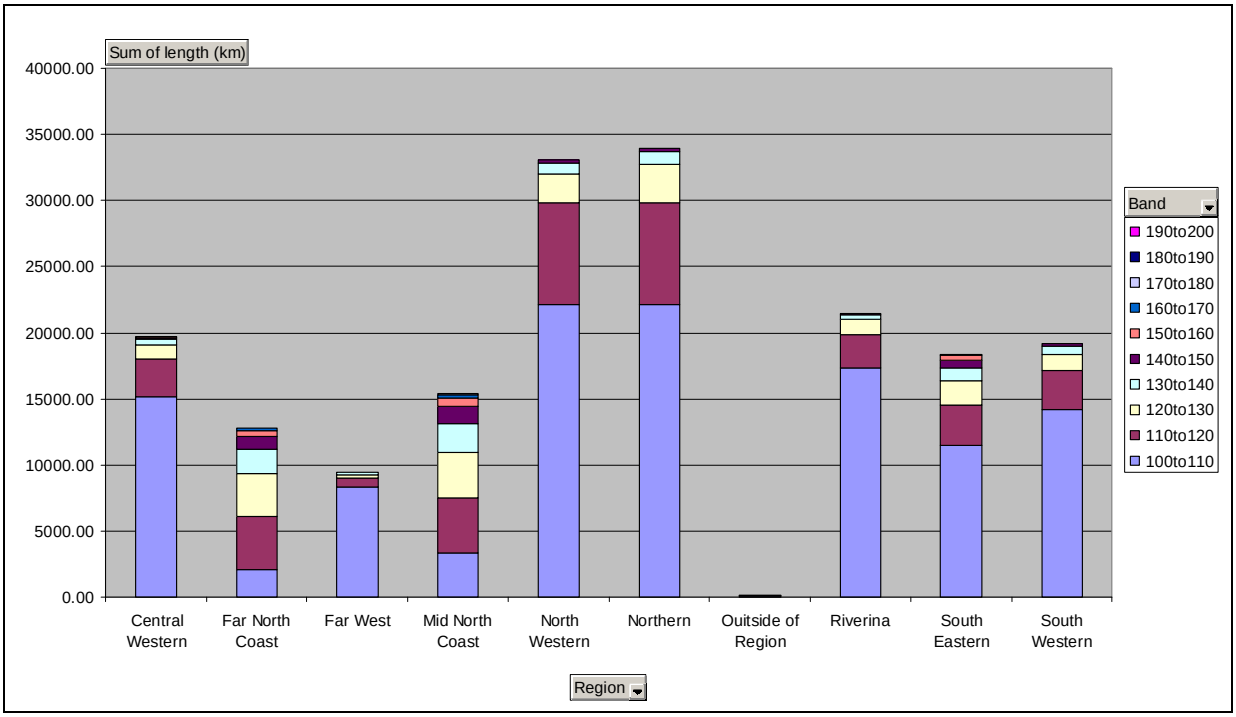

Figure 4.2: Vegetation density versus total powerline length profile by region

4.7.5 *Incremental asset inspection, vegetation control and maintenance program*

The outcome of the analysis has been the deployment of disciplined and programmed asset inspection, maintenance and vegetation control work activities and programs to be implemented from 2007-08 to 2013-14, consistent with the most efficient use and prioritisation of resources.

The program of works is summarised in the table below.

Period	Inspection and testing	Maintenance and repair
2007-08	1. Complete required policy for pole and powerline inspection, and vegetation safety clearance. 2. Complete 70 per cent of existing pole and powerline inspection backlog. Policy requirement for substation and equipment earth testing are largely deferred due to budgetary restraints.	1. Complete all identified urgent and high risk defects within 14 days / 6 months respectively. 2. Complete all possible risk defects to priority and budgetary restraints. 3. Complete all urgent and minimum 50 per cent of high risk backlog defects.
2008-09	1. Complete required policy for pole and powerline inspection, and vegetation safety clearance. 2. Complete remaining 30 per cent of existing pole and powerline inspection backlog. 3. Begin programmed substation and equipment earthing program. 4. Begin priority new inspection programs: – Live line pole top inspection of radial subtransmission powerlines – Six monthly inspections of critical distribution substation / ring main units, and – Six monthly inspections of all regulator and recloser assets.	1. Complete all identified urgent and high risk defects within 14 days / 6 months respectively. 2. Complete all possible risk defects to priority and budgetary restraints. 3. Complete all remaining urgent and high risk backlog defects. 4. A commensurate increase in defects due to the incremental inspection and testing programs.
2009-10 to 2013-14	1. Complete required policy for pole and powerline inspection, and vegetation safety clearance. 2. Continue programmed substation and earth testing program. 3. Undertake new inspection programs: – Internal inspection of all underground pits and pillars – Six monthly inspections of all critical distribution substation ring main units – Programmed live line pole top inspection of all radial subtransmission feeders – Annual thermovision program covering all critical equipment and urban network, and – Six monthly inspections of all regulator and recloser assets. 4. Undertake deferred feeder reliability improvement inspection programs: – Live line pole top inspection of poor performing feeder segments, and – Annual aerial patrol and photography of poor performing feeders.	1. Complete all identified urgent and high risk defects within 14 days / 6 months respectively. 2. Complete all identified risk defects to priority and budgetary restraints. 3. Undertake staged program to rectify risk defect backlog over 5 years. 4. Undertake deferred feeder reliability improvement maintenance programs – Live line pole top maintenance of poor performing feeder segments, and – Line corridor vegetation clearance of poor performing feeder segments. 5. A commensurate increase in defects due to the incremental inspection and testing programs.

Table 4.3: New, Deferred, and Backlog Programs based on Risk Assessment

4.8 Forecast operating expenditure – programs

4.8.1 New asset inspection and maintenance activities

As a part of the risk assessment study, a number of new activities has been introduced into the asset inspection and maintenance regime, including:

- Programmed internal inspection of all underground pits and pillars
- Six monthly condition monitoring and minor maintenance of all critical distribution substation and ring main units
- Programmed live line pole top inspection of all radial subtransmission feeders
- Annual 'thermovision' program covering all critical equipment and urban network components, and
- Six monthly condition monitoring and minor maintenance program of all regulator and recloser assets.

The operating and maintenance expenditure for these new requirements is around $7.4 million per annum on average each year from 2009-10, including the expected increase in defect maintenance requirements that would be generated by the new inspection programs.

4.8.2 Managing inspection, testing and risk defects

Country Energy has undertaken an inspection, testing and risk defect internal review using RISMO and involved investigating:

- The level of asset inspection and maintenance being performed each year
- Risk defects identified each year
- The ongoing prudent and efficient resource requirements to control current and ongoing inspection and maintenance defect related requirements, and
- The associated plan and expenditure forecasts for the 2007-08 financial year and beyond to control the backlog work on an ongoing basis.

This review indicated that the value of work outstanding for pole and powerline inspection is approximately $3.6 million and for immediate maintenance tasks is approximately $24.8 million. A significant proportion of this work will be addressed in the 2007-08 and 2008-09 financial years, however the plan of works to address the remainder is summarised in Table 4.3 above, requiring an additional $7.9 million per annum on average in operating and maintenance expenditure from 2009-10 onwards.

4.8.3 Deferred inspection, vegetation control, and maintenance programs

As previously discussed, expenditure allowance constraints in the *current regulatory control period* resulted in the deferral of parts of the asset inspection, vegetation control and maintenance programs, and individual feeder reliability improvement programs, including the following programs:

- *Earthing inspection and testing program*

  Country Energy proposes to undertake the following earthing inspection and maintenance from 2009-10:

  - Conventional substation inspection and earth testing
  - SWER substation and isolator inspection and earth testing
  - Chamber and pad mount inspection and earth testing, and
  - Inspection and earth testing of all other permanently earthed assets.

- *Feeder reliability improvement program*

  Subsequent to the release of the reliability performance *licence conditions* in August 2005, Country Energy plans to undertake a number of new initiatives specifically for improving the performance of poor performing feeder segments, including:

  - Live line pole top inspection and maintenance of poor performing feeder segments
  - Line corridor vegetation clearance of poor performing feeder segments, and
  - Annual aerial patrol and photography of poor performing feeders.

  The implementation of these programs is required in order to meet *licence conditions.*

  The enhanced vegetation control program includes:

  - More thorough vegetation inspection, scoping, and clearing of all vegetation
  - Targeted removal of overhanging limbs and clearing of the canopy across powerlines
  - Targeted removal of problem trees
  - Preventative corridor clearing to maintain an adequate ground powerline corridor, and
  - More effective major access track maintenance to ensure access at all times for routine inspections, maintenance work, and fast response to fault locations.

  The intention of the enhanced vegetation management strategy for poor performing feeder segments was to remove problem vegetation from the powerline corridors, and allow vegetation issues to be controlled on a more manageable and sustainable basis to ensure that it did not encroach between cycles. This will allow Country Energy to take a more preventative approach in the future to improve operational performance and public safety, to minimise long term costs, and be in a better position to comply with reliability performance *licence conditions*.

  Country Energy intends to undertake this vegetation control program during the *next regulatory control period*. This deferred program work will be primarily accommodated through the injection of approximately $57 million per annum on average in operating and maintenance expenditure from 2009-10 onwards.

  The correction of these deferred programs is a key requirement moving forward to the achievement of this reliability improvement objective.

4.8.4 Other incremental changes in expenditure

Country Energy has recognised that operating and maintenance requirements change during a *regulatory period* for a range of other reasons including growth in new customer connection, peak demand, powerline length, inflation, real wage growth, real cost increases in materials and equipment, and the potential for productivity improvements.

The incremental rate of change in operating and maintenance expenditure expected over the *next regulatory control period*, due to the impact of these factors changes, can be adjusted annually according to the formula:

$$Opex_{t+1} = Opex_t * (1+F+G-P-T)$$

Where:

- F is a real wage and material cost growth factor
- G is a network growth factor
- P is a productivity saving
- T is a trade off between emergency response operating expenditure and capital programs

Accordingly it is necessary to determine the annual rate of change in expenditure level over the *regulatory period*.

- *Demand growth*

  Most of the forecast operating and maintenance expenditure is associated with the existing asset base. However growth related capital expenditure increases the size of the network and the number of assets to be maintained, operated and managed. Accordingly, there is a need to establish a relationship between demand growth and real increases in operating and maintenance expenditure.

  The rate of change should reflect the marginal cost associated with providing that additional output. To be able to quantify this, it is necessary to first identify the measure(s) that are considered important for explaining the anticipated incremental costs to be incurred. The approach taken should be administratively simple and aim to provide the right incentives.

  There are a number of appropriate measures including:

  - Asset growth
  - Energy consumption
  - Peak energy demand
  - Number of distribution customers, and
  - Length of the distribution network.

  Country Energy believes the rate of change should be correlated with the growth capital expenditure. Country Energy has increased its network related operating expenditure by the proportion of average annual growth related capital expenditure over the total replacement costs of distribution assets. This ratio is then reduced by 25 per cent to reflect that new assets will not incur condition based asset maintenance.

- *Real wage and material cost increases*

  It is necessary to determine a price index relevant to the inputs employed in operating and maintenance activities. Traditionally jurisdictional regulators have adopted a simple Consumer Price Index (CPI) as the cost inflator as it is a well recognised measure of inflation, however during the *current regulatory control period* wage and material cost growth has exceeded inflation. In this *regulatory proposal*, Country Energy has presented the expenditure forecasts in real terms including market expectations of real wage and material/equipment cost increases (refer to Appendices C and H).

- *Productivity*

  The level of operating expenditure has been reduced by expected productivity gains due to the refinement of existing work practices. This productivity saving has been calculated consistent with Country Energy's resourcing plan detailed in Appendix A.

- *Emergency response offset*

  Country Energy has included a reduction in emergency response expenditure to reflect the increased reliability capital program. It is expected that the increase in reliability expenditure will lead to offsetting improvements in the current level of fault and emergency work on the network.

4.8.5 *Standard Control Services – description of operating and maintenance activities*

Country Energy collects operating and maintenance costs against broad cost activities, which are aligned with the operating cost categories in the regulatory accounts for *standard control services* and *alternate control services*. The broad cost categories relating to *standard control services* are summarised in Table 4.4 below.

Category	Description
Network maintenance expenditure	This expenditure is required to provide a safe network, to meet regulatory obligations and to meet customer requirements for network quality and reliability.
Other network maintenance expenditure	Network operating expenditure is work associated with the efficient operation, outage management, customer connections, and switching of the network
Other operating expenditure including corporate support	Other operating costs include the electricity distribution business' share of business support functions, and other corporate support functions.

Table 4.4: Operating expenditure category summary

4.8.6 *Network maintenance expenditure*

Network maintenance expenditure is work associated with the efficient inspection, vegetation control, and maintenance and repair of the regulated distribution assets. It is required to provide a safe network, to meet regulatory obligations and to meet customer requirements for network quality and reliability.

- *Asset inspection, testing and condition monitoring*

  Routine asset inspection and condition monitoring activities include field and aerial inspection of overhead distribution assets (poles, pole top structures, conductors, substation structures, transformers, high and low voltage switchgear, and other distribution electrical equipment), powerline to ground and vegetation clearances, thermography of powerline and substation structures, and non destructive testing of power transformers and switchgear. These activities are critical in assessing the current state of distribution equipment and establishing network safety, risks and liabilities that ultimately determine the maintenance work plan. Chemical preservatives are also generally applied to wood poles at the time of inspection.

  Inspection cycles are based on associated risks and utilises both ground inspections and aerial patrols. Inspection criteria are detailed in asset management policies and procedures. All private overhead powerlines and limited life poles are inspected on the same basis.

  The inspection of customer connection equipment ensures compliance with relevant legislative and safety requirements.

- *Asset maintenance and repair*

  Overhead powerline maintenance and repair include activities such as:

  - pole replacement, reinstatement and temporary staking
  - the replacement of damaged pole top components such as damaged conductor, cross arms, insulators, ties, pole caps, and connectors
  - maintenance and replacement of distribution powerline equipment
  - maintenance and replacement of damaged or inoperable switchgear fuse replacement
  - fuse replacement

- tightening of pole top hardware
- fitting of low voltage spreaders, and
- increasing conductor clearances involving the re-tensioning of the conductor, lifting the conductor by raising cross arms, or installing raiser brackets.

Distribution substation maintenance expenditure relates to repairs to the transformer tank and related substation structures, fixing earthing problems, substation enclosure weed control, and other minor repairs.

Zone substation maintenance covers all routine and defect maintenance activities carried out on zone substation primary and secondary plant, powerline regulators and automatic circuit reclosers. Country Energy maintains circuit breakers on average every 3 to 4 years, protection and control equipment every 3 years and zone substation transformers and regulators on average every 12 months.

Customer service mains maintenance covers the cost of routine maintenance of existing services and includes activities such as re-tensioning and re-positioning services.

Routine maintenance or replacement of existing type 5-7 meters is required to ensure that meters are accurate and safe. There are obligations to have test plans in place to ensure that meters are accurate. Activities also include replacing faulty frequency injection relays, and resetting and replacing time switches.

- *Vegetation control*

  Vegetation control and the standard of tree clearance is critical to ensuring the safe and reliable operation of Country Energy's distribution network, particularly those parts of the network that have been constructed in areas with high levels of vegetation.

  All vegetation control works is undertaken in accordance with Country Energy's Vegetation Management Plan and associated policies and procedures. The Vegetation Management Plan is designed to comply with the requirements of the *Electricity Supply Act* 1995 (NSW), subordinate legislation and the principles outlined in the electricity industry guide ISSC3-2005 Guide to Managing Vegetation near Power Lines. The latter specifies the clearances to be maintained between overhead mains and trees to ensure public safety and to minimise the risk of bushfires.

  In determining risk to the safe operation of powerlines due to vegetation that is likely to grow into or encroach on the clearance space, Country Energy gives consideration to the following elements:

  - Frequency of the cyclic program
  - Effectiveness of previous vegetation control activities
  - Alternative vegetation control practices, and
  - Proactive use of technical alternatives to vegetation control.

  The clearing of vegetation from proximity to powerlines has been and will continue to remain an ongoing challenge for Country Energy in terms of improving safety and reliability performance, given the predominantly overhead power system. In some areas, the clearance space can be difficult to maintain due to dense, aggressive, high vegetation growth environments. In some cases, the original overhead powerline corridors that cut through timbered areas was not cleared to the proper width and large trees, which require constant trimming, are now present within the corridor.

In urban areas, vegetation is generally cleared on an annual basis to ensure adequate clearances. For powerlines in rural areas, Country Energy vegetation is cleared to the required dimensions on a one to three year cycle. Typically coastal and other high rainfall regions are based on a 2 year cycle, where as a 3 year cycle or even longer are acceptable inland. Country Energy also undertakes an annual aerial inspection of overhead mains to identify and correct inadequate tree clearances and other defects before the bushfire season.

The extent of clearing required is regulated in terms of 'clearance at all times'. The minimum clearance space required between a powerline and trees are in accordance with ISSC3 guidelines. The visual inspection of vegetation clearances may occur following a feeder fault, for a poor performing feeder, during the routine 4.5 year pole inspection cycle, or during the routine clearing cycle.

Where possible, 4 metre wide tracks are provided for maintenance access along the powerline.

The extent of vegetation related issues and their impact on safety performance have been underestimated in the past, particularly the removal of trees and limbs that overhang the clearing space of a powerline conductor in fire hazard areas. In the last few years, Country Energy's vegetation management scoping activity has been ramped up, which has required substantial increases in vegetation control related expenditure.

The majority of vegetation control is externally contracted due to the specific nature of this activity and because generally it is more cost efficient to do so. These contracts are competitively tendered. Country Energy works closely with contractors to ensure the efficiency and effectiveness of this activity, and to improve stakeholder interface.

- *Fault and emergency repair and restoration of supply*

  This area covers fault and emergency repair and restoration of supply for planned and unplanned interruptions caused by events such as storms, equipment failures, acts of vandalism, and vehicle collisions. On notification of the customer supply interruptions, Country Energy dispatches field employees to deal with the fault.

4.8.7 Other network maintenance expenditure

Other network maintenance expenditure is work associated with the efficient operation, outage management, customer connections, and switching of the network. The main areas of expenditure include:

- *System control*

  System control costs are associated with the operation of the network relating to field and control centre operations, operational switching, system outage management and dispatch, and related operations activities. A system control group is responsible for the 24 hour day to day operational performance of the distribution network. Customer connections are coordinated centrally through the call centre and customer service centres.

- *Networks and Infrastructure divisional operating expenditure*

  Country Energy's Networks and Infrastructure division covers asset strategy, management and policy development, subtransmission and distribution planning and development, management of the network maintenance program, design and construction standards, specialised engineering services.

  The network strategy management group provides the necessary support to ensure that Country Energy as an asset owner complies with legislation relating to the management of the assets, planning, safety and environmental matters.

A specialised engineering services group is responsible for the specification, utilisation and maintenance of the high value major plant items, including power transformers, protection systems and circuit breakers. The group takes carriage of the plant maintenance responsibilities within zone substations as well as voltage regulators and reclosers that are strategically placed on Country Energy's distribution network. In addition, this group is responsible for the management of major subtransmission powerline and zone substation augmentation projects.

The Networks and Infrastructure division is also responsible for major specialised technology developments in the network such as the establishment of SCADA systems, load control and the management of the GIS and asset management systems including ongoing minor enhancements and application developments.

4.8.8 Other operating expenditure (relating to Standard Control Services)

Other operating costs include the electricity distribution business' share of business support functions such as customer services, customer call centres, meter reading and data services for type 5-7 meters, billing and revenue management, and other corporate support functions. Country Energy notes that there is little comparative data available in this respect because of the differing company specific characteristics and organisational structure.

- *Meter reading and data services for Type 5-7 metering*

  Timely and accurate reading of meters is required to calculate the amount of electricity supplied to customers, and to capture this data in the billing system. Meter reading costs include labour, transportation, record keeping facilities, and the associated information technology support.

  The *IPART determination* provided that metering services for type 5-7 meters would be regulated under the distribution weighted average price cap for the *current regulatory control period*. Country Energy has assumed that the network business will continue to retain responsibilities for these services in the *next regulatory control period* and therefore included an estimate of these costs to be recovered as a standard control service under the weighted average price cap.

- *Customer services*

  This area covers the costs of providing a broad range of customer services including services provided from the call centre and customer service centres, providing information to customers, handling customer inquiries, customer reconnection and disconnection, new connection inquiries, network faults and supply complaints, claims and associated information technology costs.

  As regulated customers take up the offer of contestable contracts, significant strain has been placed on the business to action these requests in a timely manner. The cost allocation for call centres is based on a call centre activity.

- *Network advertising and marketing*

  Network marketing and advertising costs are necessary costs arising primarily due to the obligations of the distribution business for customer awareness of bushfire and powerline safety. Significant effort is devoted to promoting safety throughout the service area, which involves a level of communication exchange, liaison and feedback between the distribution customer and Country Energy. These expenses include other activities such as:

  – Analysis of customer energy usage and promotion of the use of high efficiency appliances for domestic customers
  – Promotion of new technologies to business customers to help achieve efficiencies
  – Communicating information on network prices and other information on reliability and system augmentation
  – Advertising planned supply interruptions
  – Distribution customer and market research.

- *Billing and revenue management*

  Billing and revenue collection costs include the processing, printing and distribution of customer invoices, the validation and reconciliation of invoice amounts, credit management activities, and administration of customer payment avenues. This also includes the cost of preparing statements for retailers. The distribution business must maintain information such as customer billing histories, consumption histories, and network price data.

  The allocation to the distribution business is consistent with the cost allocation method approved by the *AER*. An allocation of the annual cost of managing the customer information system (CIS) is included in the corporate support allocation.

- *Corporate support services*

  Allocated to distribution business functions are corporate services that provide necessary support to both the distribution business and other non regulated activities (including retail) as it supports the licence requirements and assets of the divisions.

  Forecast operating costs for the distribution business include an efficient share of corporate support costs. Corporate support costs have been allocated between the regulated and non regulated segments on the basis of Country Energy's approved cost allocation method.

  Corporate support functions include:

  Finance – These costs cover the financial and management accounting services, taxation and treasury functions including accounting, management reporting and operational cost analysis, audit fees, accounts payable, payroll and general financial reporting.

  Information Technology and Telecommunications – These costs cover major information technology systems built to facilitate retail market competition, financials, CIS and a host of other information technology applications. It also includes the maintenance and software upgrades on general personal computers for the distribution business. There is also an allocation of all telecommunication costs. These costs include radio communications and telephones.

  Regulatory and Compliance – These costs are incurred to meet regulatory, environmental and industry compliance requirements. It includes the costs associated with preparing regulatory accounts and audits, preparing *regulatory proposals*, and other industry, technical regulatory reporting and compliance requirements.

  Human Resource Management and Development – These costs cover the human resource management and administration including policy development, monitoring, recruitment and training.

  Environmental and Safety Management – These costs are associated with coordinating the development of corporate environmental and Occupational Health and Safety policies and procedures, liaising with government agencies and managing corporate environmental and safety reporting.

  Property Management – These are the costs associated with the management of properties including general maintenance and upkeep (cleaning, gardening, waste collection, and general maintenance) of office and depot sites, and any rental fees.

  Other Corporate Costs – Costs associated with executive management and administration, company secretary, corporate governance, stakeholder relations and communications, legal services, business development and strategic development and planning.

4.8.9 *Self insurance*

In order to reflect the efficient costs of achieving the operating expenditure objectives, Country Energy has included a cost for self insurance. The *regulatory information notice* requires Country Energy to specify the values that are proposed to be attributed to the cost of self insurance for each year within the *regulatory control period*, together with:

- details of all amounts, values and other inputs used by the *RNSP* to calculate its proposed self insurance costs
- an explanation of the *RNSP*'s calculation of these amounts, values and inputs
- a board resolution to self insure
- confirmation the *RNSP* can credibly self insure the identified events
- details of the particular risks against which the *RNSP* will self insure
- a report from an appropriately qualified actuary or risk specialist verifying the calculation of risks and corresponding insurance premiums, and
- confirmation that the *RNSP* will establish a self insurance reserve fund for its self insurance premiums and that it will record a deduction from the self insurance reserve when a self insurance claim is made.

Country Energy engaged SAHA International to undertake the actuarial assessment to calculate the above risks (except workers compensation), and the corresponding self insurance premium. The total self insurance premium is shown in Table 4.5 below. The SAHA International report includes full details of the amounts, values and other inputs used to calculate this proposed premium and an explanation of the calculations involved (refer to Appendix D).

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Self Insurance	3.9	3.9	3.9	3.9	3.9	19.6

Table: 4.5 Self Insurance allowance

4.8.10 *Debt and equity raising costs*

The *AER* and other Australian regulators have accepted the need to compensate businesses for the cost of refinancing existing debt and raising incremental equity. However, the approach taken in the past has incorporated a serious flaw that has led to an underestimate of the cost of raising capital. Specifically, regulators have only recognised transaction costs associated with a direct payment to a third party. They have failed to recognise the, often higher, costs associated with underpricing the issue in order to ensure its success.

The *AER* has taken some steps to redress this flaw when it agreed to update the methodology set out by Allen Consulting Group in its 2004 report to the Australian Competition and Consumer Commission (ACCC). This set the regulatory precedence of ensuring recognition of the cost of a number of the direct raising costs by allowing an increased cost of debt raising to 12.5 basis points per annum (bppa) in direct transaction costs for debt raising in its decision for SP AusNet. This is up from the 6 bppa traditionally recognised by regulators.

- *Debt Raising Costs*

  Although the *AER* has taken a number of direct costs into consideration in the SP AusNet decision, a number of these direct costs have not been included. Consistent with *AER* research, a further 2 bppa can be added to this to reflect other direct costs (such as legal costs). This arrives at an estimate of 16 bppa for direct costs. If we also add 3 bppa to reflect the costs of underpricing in public debt issues we arrive at an estimate of 19 bppa. Further supporting information showing the need for regulators to take into account these additional direct costs are detailed in the independent CEG report included in Appendix I.

  On this basis Country Energy does not believe that the *AER* has properly justified its departure from regulatory precedent of allowing 12.5 bppa for the direct costs of issuing corporate bonds in its SP AusNet decision. Indeed, if any departure is to be made it appears clear that it should be in the opposite direction.

  The most conservative approach would be to maintain the regulatory precedent in setting direct costs at 12.5 bppa plus a 3 bppa allowance for indirect costs. (Despite the evidence described above that direct costs alone account for 16 bppa.) This gives a total cost of raising debt of 15.5 bppa.

  Country Energy has adopted this conservative approach and included a total cost of debt raising of 15.5 bppa for this *regulatory proposal*. The projected debt raising costs for each year over the *next regulatory control period* is summarised in Table 4.6 below.

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Debt Raising Costs	3.8	4.3	4.8	5.3	5.9

Table 4.6: Debt raising costs from 1 July 2009 to 30 June 2014

- *Equity Raising Costs*

  The same issues affecting debt raising costs arise in relation to estimating the costs of raising equity. Any attempt to measure equity raising costs must capture both direct and indirect costs of equity raising.

  The *AER* has previously set the costs of equity raising at 3 per cent based on the advice of the Allen Consulting Group. Research detailed in CEG report shows that the current 3 per cent estimate by the *AER* is not sustainable. In terms of its derivation this measure only captures underwriting costs – not underpricing cost.

  Underwriting and underpricing published rates (since 1990) range from the lower cost market place of 5.07 per cent to a combined world rate of 12.99 per cent. A number of studies of global equity raising costs conservatively estimate the combined underwriting and underprcing costs at 7.6 per cent.

  Country Energy notes that equity raising costs are a legitimate operating expense that will be decided in the future as part of the *AER*'s *distribution determination*. While Country Energy agrees with the methodology described in the CEG report and the conclusions reached, we have currently excluded these costs from the building block calculation due to the circular nature of the equity raising costs calculation and its dependence on a number of inputs that will be finalised through the course of the *distribution determination* process.

4.8.11 Alternate Control Services

The total operating expenditure for *alternate control services* is detailed and provided in Section 11 of this *regulatory proposal*.

4.9 Summary of efficient operating expenditure forecasts for the *next regulatory control period*

Forecast expenditures are summarised in Table 4.7 below. Costs have been categorised and presented consistent with the IPART regulatory accounts format.

Country Energy has forecast productivity gains in resourcing its internal programs of work in accordance with Country Energy's resourcing plan detailed in Appendix A.

Country Energy's proposed asset refurbishment, renewal and vegetation management projects are designed to improve the reliability and security of electricity supplies, hence Country Energy has forecast an offset in fault and emergency related expenditure.

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Network Operating Costs	18	18	18	18	19
Network Maintenance Costs					
- Inspection	38	40	41	42	44
- Pole replacement	2	2	2	2	3
- Maintenance and repair	68	70	72	75	77
- Vegetation Management	105	109	113	118	124
- Emergency Response	49	50	52	54	56
- Other Network Maintenance Costs	84	86	89	92	95
Other Costs					
- Meter reading	19	20	20	21	22
- Customer service	13	14	14	15	15
- Advertising, marketing and promotions	5	5	5	5	5
- Other operating costs	0	0	0	0	0
Self insurance costs	4	4	4	4	4
Debt raising costs	4	4	5	5	6
LESS: Productivity	(1)	(3)	(4)	(4)	(4)
LESS: Fault and emergency	(1)	(2)	(3)	(4)	(5)
TOTAL OPERATING EXPENDITURE	**408**	**417**	**430**	**445**	**461**

Table 4.7: Forecast Operating and Maintenance Expenditure for *Standard Control Services*

The projected operating and maintenance expenditure for 2009-10 is $408 million, which includes a 'step' increase of $91 million to account for new, deferred and backlog asset inspection and maintenance works programs to mitigate risk, improve network performance, and continue to support the functions of the electricity distribution network business. The annual operating and maintenance expenditure represents some 3 per cent of the $14.7 billion total replacement value of all system assets.

Category ($2008-09)	2006-07	Average 2009-10 to 2013-14	Explanation of Significant Variations
Network Operating Costs	29	18	Alignment of budget methodology
Network Maintenance Costs			
- Inspection	21	41	Change in inspection regime, cost escalators
- Pole replacement	4	2	No significant change
- Maintenance and repair	42	72	Change in maintenance regime, cost escalators
- Vegetation Management	45	114	Changes to workload, reliability, cost escalators
- Emergency Response	54	52	No significant change
- Other Network Maintenance Costs	78	89	Cost escalators
Other Costs			
- Meter reading	21	21	No significant change
- Customer service	17	14	No significant change
- Advertising, marketing and promotions	5	5	No significant change
- Other operating costs	0	0	No significant change
TOTAL OPERATING EXPENDITURE	**314**	**429**	

Table 4.8: Explanation of significant variations

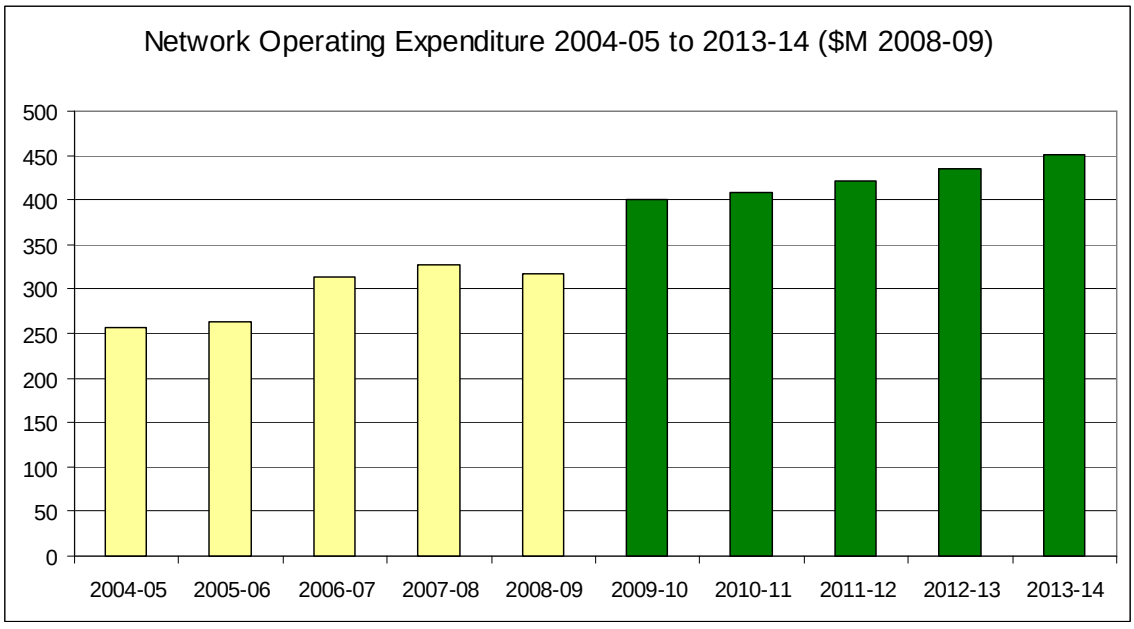

Figure 4.3: Network operating expenditure 2004 to 2014

4.10 Concluding comments

The increases in forecast operating and maintenance expenditure detailed in this section arise from various new and deferred reliability programs. These additional planned inspection, vegetation control and maintenance expenditure programs can be resourced, and the additional work will be allocated between permanently employed employees and external contractors to achieve maximum efficiency.

The forecast operating expenditure is considered appropriate in order to permit Country Energy to better manage maintenance, comply with feeder reliability *licence conditions* and the safety and risk mitigation requirements associated with an ageing asset base.

Country Energy believes that it has provided sound substantiation of the projected operating expenditure forecasts for the *next regulatory control period*, and that these forecasts represent best estimates, arrived at on a reasonable basis based on detailed and rigorous modelling and analysis.

Capital Expenditure

5 Capital Expenditure

5.1 Overview

This section of the *regulatory proposal* provides a brief overview of capital expenditure during the *current regulatory control period*, and the capital expenditure forecasts for the *next regulatory control period.*

The remainder of the section is structured as follows:

- Section 5.2 summarises the key provisions of the *Rules* relating to proposed capital expenditure
- Section 5.3 describes Country Energy's capital expenditure incurred during the *current regulatory control period*
- Section 5.4 explains Country Energy's approach to capital investment planning
- Section 5.5 details the key assumptions used in establishing the capital expenditure forecast for the *next regulatory control period*
- Section 5.6 presents an overview of Country Energy's capital expenditure forecast for the *next regulatory control period*
- Section 5.7 presents Country Energy's growth related capital expenditure forecast, its methodology and programs
- Section 5.8 presents Country Energy's asset renewal related capital expenditure forecast, its methodology and programs
- Section 5.9 presents Country Energy's environmental, safety, security and legal related capital expenditure forecast, its methodology and programs
- Section 5.10 presents Country Energy's reliability and quality related capital expenditure forecast, its methodology and programs
- Section 5.11 presents Country Energy's non system related capital expenditure forecast, its methodology and programs
- Section 5.12 summaries Country Energy's capital expenditure forecasts for the *next regulatory control period*, and
- Section 5.13 provides concluding comments.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

5.2 *National Electricity Rules* requirements

The *Rules* set out the general principles that must be reflected in the calculation of distribution network prices. In accordance with clause 6.5.7 of the transitional *Rules*, the *AER* must assess the reasonableness of Country Energy's capital expenditure forecasts.

The information and matters relating to capital expenditure are provided as required by Schedule S6.1.1 of the transitional *Rules*. In compliance with the *regulatory information notice*, the capital expenditure forecasts are also provided in Pro forma 2.2.1.

5.3 Historical capital expenditure

The aim of this section is to provide an overview and analysis of Country Energy's actual and estimated capital expenditure performance during the *current regulatory control period* compared to regulatory allowances provided under the *IPART Determination*. The analysis has been based on the available audited regulatory accounts submitted annually to IPART for the first three years of the *current regulatory control period*, plus forecasts for the 2007-08 and 2008-09 years. The 2007-08 estimates have been based on the anticipated expenditure outcome based on eight months actual expenditure to February 2008 and four months forecast expenditure. Actual expenditure for the 2007-08 financial year will be updated and regulatory accounts finalised and audited.

Country Energy has continued to deliver sound network performance and customer service, while making prudent investments to meet the expectations and requirements of stakeholders. During the *current regulatory control period*, Country Energy has shown an upward trend in capital expenditure. Actual capital expenditure on *standard control services* has exceeded the regulatory allowances provided by IPART, with an expected cumulative variation of around 25 per cent over the course of the *current regulatory control period*, as illustrated in Table 5.1 below.

$ M (nominal)	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Regulatory Allowance	245	249	378	394	404	1,670
Actual/Estimated	271	347	437	474	576	2,105
Over/(Under) spend	27	98	58	80	172	435

Table 5.1: Capital expenditure for the *current regulatory control period* compared to regulatory allowances

In accordance with clause S6.1.1(6) of the transitional *Rules*, Table 5.2 overleaf shows actual and estimated capital expenditure by asset category driver for the previous and *current regulatory control period*, consistent with the asset categorisation used for forecasting capital expenditure for the *next regulatory control period* presented in Section 5.6.

$M (nominal)	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
System Assets										
Asset renewal/replacement			39	46	45	52	70	94	109	112
Growth			49	56	55	63	86	174	193	198
Reliability and quality of service enhancement			31	29	46	51	86	62	64	127
Environmental, safety, statutory obligations			11	14	14	16	22	11	12	13
Total System			**129**	**145**	**159**	**182**	**263**	**341**	**379**	**451**
Non System Assets										
Information Technology			30	32	16	34	19	27	28	36
Furniture and fittings, small plant & tools			11	22	12	12	12	17	8	9
Motor vehicles			12	16	23	30	31	37	41	54
Land & Buildings			2	5	6	11	24	13	13	21
Other non system assets			0	0	0	2	-1	2	6	5
Total Non System			**55**	**76**	**58**	**90**	**84**	**96**	**95**	**124**
Total Actual/Estimated Capital Expenditure	**126**	**145**	**184**	**221**	**217**	**271**	**347**	**437**	**474**	**576**

Table 5.2: Actual and estimated capital expenditure by asset category driver for the previous and *current regulatory control period*

Country Energy's actual capital expenditure has significantly exceeded regulatory allowances in the *current regulatory control period*. Despite the pressing need for these investments, Country Energy has only partially been funded in respect of the total cost of its capital program and will earn no return on or of the capital expenditure above the regulatory allowances.

The main reasons for the variations between the relevant regulatory allowances and capital actual expenditure are as follows:

- *IPART determination* – Country Energy's approved regulatory allowances being towards the lower end of a plausible range. If Country Energy had capped actual expenditure at the level of the regulatory allowances, it may have compromised safety and risk, compliance with statutory and legislative obligations, service standards and the long term integrity of the network. Country Energy expects to exceed the regulatory allowances by 20 per cent in 2008 and 43 per cent in 2009.

- *Buoyant economic and market conditions influenced labour availability and material costs* – Prices for essential materials and labour have increased at a much higher rate than inflation. This is discussed in greater detail in Appendix C. The biggest impacts in average annual real terms have been seen in the following areas in the period 2004-05 to 2006-07:
  - Copper 37.3 per cent
  - Oil 20.9 per cent
  - Aluminium 12.8 per cent
  - Wages and Construction 3.4 per cent
  - Producers' margin 16.1 per cent

- *Labour cost increases* – Country Energy has experienced an upward trend in labour costs during the *current regulatory control period*. As outlined in Section 4.3.3, the prevailing labour market conditions, brought about by the growing demand for skilled electricity workers and the significant increases in work volumes in electricity networks across south-east Australia, have placed increased upward pressure on labour costs. These factors have resulted in escalated field and technical labour rates. Insufficient provision was made or rising labour costs in the capital expenditure allowances in the *current regulatory control period*. CEG's analysis indicates that skilled labour costs have risen in real terms by 1.8, 1.5, and 4.3 per cent respectively over the first three years of the *current regulatory control period*.

- *Unit rates used in approved construction costs were not reflective of market conditions* – The rates used in the *current regulatory control period* were not based on Country Energy's own efficient unit costs. Country Energy's actual unit rates are higher than those used in the *IPART determination* primarily due to higher on cost rates and significant increases in labour and material costs during the *current regulatory control period*.

- *Increases in competitive market rates* – In order to complete essential capital works, there has been greater reliance on external contractors that bid competitively for subtransmission powerline construction and zone substation works. The primary reasons for this cost increase are:
  - General construction costs across the sector have escalated more rapidly than CPI in recent years due to general increases in building and construction costs, and
  - Current high level of economic activity in Australia has caused shortages in materials and imbalances in the skilled labour market, with resulting higher than average price increases.

  These factors have led to an increase in the cost of key materials such as concrete poles, conductors, cable, and power transformers, and in the cost of civil works for zone substations and cable trenching.

- *Insufficient capital expenditure allowed for the former Australian Inland* – Australian Inland was merged with Country Energy, and Australian Inland's regulatory allowances were not representative of the true expenditure levels required to maintain Australian Inland's network.

- *Implementation of enhanced security and protection of critical infrastructure* – Commonwealth and State governments have introduced new initiatives imposing requirements on owners and operators for the protection of critical infrastructure. The Energy Supply Association of Australia also released new guidelines for preventing unauthorised access to various electrical installations after investigations by the State Coroner into several fatalities. Little or no expenditure was incorporated in the *current regulatory control period* allowances for securing capital infrastructure.

- *Increased difficulty with land and easement acquisitions, particularly in coastal and populated areas, and increases in related costs* – Subtransmission and zone substation costs have increased due to increasing difficulty in obtaining suitable powerline routes in high growth corridors, obtaining environmental and cultural heritage approval, and increasing land acquisition costs.

- *Higher than expected growth related capital expenditure in some parts of the network* – Augmentation of the network has been essential to avoid utilisation rates exceeding acceptable limits, and reducing reliability and security of supply in these areas. Contributing factors to increased growth related capital expenditure include:
  - Higher levels of customer connections and peak demand growth in localised pockets, especially the coastal strips of the network
  - Faster than expected shift to summer peaks in some parts of the network
  - Greater than anticipated economic activity and housing booms in these areas
  - Increasing penetration of air conditioners into homes, and
  - Material and labour cost increases as discussed above.

- *Higher than expected asset renewal expenditure (including statutory obligations and reliability and quality of supply related investments) due to the deteriorating condition of assets and increasingly ageing asset base* – Country Energy has been required to make substantial investments to arrest asset deterioration and to comply with new reliability *licence conditions*. Factors that have contributed to the increased renewal and replacement expenditure include:
  - As a recently merged business, Country Energy did not have all of the necessary information to accurately forecast renewal capital expenditure for the *current regulatory control period*. Country Energy has since been able to collect more detailed and accurate information relating to the condition and age of system assets.
  - Material and labour cost increases as discussed above.
  - The main driver for the increased levels of expenditure is the condition of assets. Higher levels of expenditure were required to ensure that the asset condition did not deteriorate to the extent that there was an increased risk of component failure.
  - Continuing to spend at regulatory allowance levels for asset renewal, as a percentage of the total asset replacement cost of around $14.7 billion, is unsustainable.

  Country Energy and its predecessors have long been predicting an increase in expenditure in this category. It is clear that Country Energy has entered a period in which the requirement for asset renewal expenditure must increase.

This overspend has been supported with the availability of additional resource capability for construction works that has enabled Country Energy to shift its focus from the previous reactive approach to a more aggressive asset renewal program including proactive identification and rectification of asset age and condition related problems. However, even with the current levels of expenditure the condition of the assets continues to deteriorate.

- *Increases in non system expenditure primarily due to the recruitment of additional employees to alleviate resource constraints and facilitate the delivery of an expanded capital works and maintenance program during the current regulatory control period* – At the time of the *IPART determination*, Country Energy indicated that it would increase employee levels, however the exact numbers, location and accommodation requirements were not known or included in the expenditure forecasts. Flow on increases in non system capital expenditures caused by additional employee numbers include:
  - *Modifications, extensions or new building accommodation requirements*. Country Energy has also established new field service centres during the *current regulatory control period*. Country Energy's service centres provide quicker response times to faults and improved customer service. There have also been significant increases in land acquisition and building costs, driven by the strong economic growth, in some part of the service area and in regional centres.
  - *Heavy and light fleet requirements*. Several initiatives have been adopted including replacement of six cylinder vehicles with more fuel efficient four cylinder and diesel vehicles, replacement of Elevated Work Platform (EWP) older than 10 years to alleviate maintenance requirements, and these have increased regulatory compliance has resulted in additional capital investment in heavy and specialised fleet equipment. The widespread use of live line crews has also resulted in extra heavy vehicles being purchased.
  - *Information systems and infrastructure*. Major information system applications introduced during the *current regulatory control period* have included a distribution and outage management system (ENMAC), ongoing maintenance and support of the asset and GIS, resourcing and works scheduling system and the introduction of new financial systems (PeopleSoft). The increase in employees numbers have also added substantially to the ongoing support, licence and maintenance costs associated with the information technology portfolio. The increase in employee numbers also impacted on a range of other miscellaneous non system expenditures including tools, test equipment, office equipment and furniture.

5.4 Country Energy's capital investment approach

The challenges and unique operating factors facing Country Energy have been outlined in the introduction to this *regulatory proposal*. Country Energy has established a robust asset management system and processes consistent with these factors and industry best practice, including:

- Best practice asset management strategies and procedures
- Employment of risk management techniques
- Asset investment and decision tools
- Implementation of comprehensive asset information and management systems
- External contracting of non core business activities through competitive tendering and performance contracts
- Governance and business processes for setting and implementing capital and operating budgets, and
- Business reporting and general performance management.

5.4.1 *Network Asset Management Plan (NAMP)*

Country Energy's work programs and expenditure forecasts are derived from its *NAMP*. As discussed in Section 4.5.1, the *NAMP* provides for the strategic management of physical system assets to best support the delivery of network services. It consolidates into a single strategic document, setting Country Energy's corporate strategic direction and the network services delivery strategy, with the asset management strategies, policies, processes, resources and the planned capital investments, asset maintenance, and demand management. The general structure of the *NAMP* is shown in the figure below.

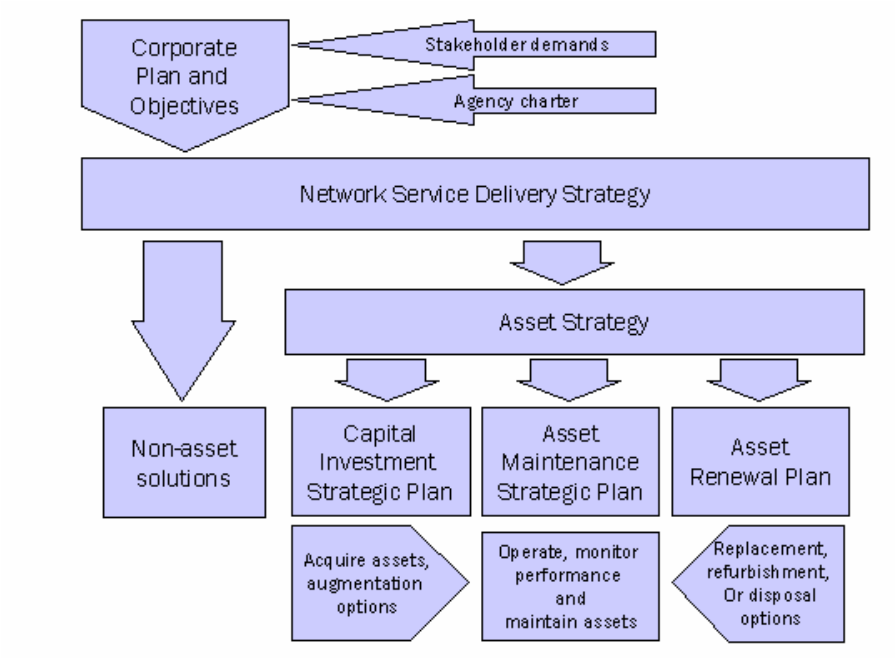

Figure 5.1: General Structure of the NAMP

The *NAMP* takes a long term view on how Country Energy intends to manage its assets, with the objective of maximising the technical and financial performance of the network for all stakeholders and to consistently provide customers with high quality, safe and reliable network services, at the lowest possible price, while preserving the value of public assets.

A comprehensive overview of the condition of network asset reliability, security and quality of supply objectives, and the details of the plans for capital investment, network augmentation, asset renewal, asset inspection and maintenance over the planning horizon to 2013-14 is provided.

The *NAMP* has been prepared in accordance with the compliance obligations of network management legislation, regulations and related codes of practice, and reflects recognised industry best practices and standards relating to the management of electricity infrastructure assets. It is designed to conform with the NSW Government's TAM policy and planning guidelines.

The *NAMP* draws together detailed asset management strategic planning documents including:

- Capital Investment Strategic Plan that comprises the Network Augmentation Management Plan Reliability, Quality, and Security of Supply Management Plan, and the Demand Management Strategic Plan
- Asset Renewal Management Plan
- Asset Maintenance Management Plan, and
- Safety plans.

Country Energy's key network asset management strategies are contained in these plans.

The broad objectives of the *NAMP* are to:

- Support the delivery of effective and efficient regulated distribution services
- Meet predicted electricity demand growth
- Maintain the network in good operating condition and reduce the incidence of premature failure
- Preserve and enhance the operational life of the assets
- Ensure deteriorating assets are scheduled for refurbishment or replacement following routine inspection and/or condition assessment
- Meet the reliability and quality needs and expectations of our customers, service objectives and the requirements of the *licence conditions*
- Maintain a distribution system that is safe for the community, customers and employees by ensuring compliance with all statutory and regulatory obligations, sound asset maintenance practices and safety related obligations, and
- Implement best practice financial performance ensuring an optimal balancing of capital and operating expenditure.

The ability of Country Energy to meet its customers' requirements most efficiently is dependent to some extent on it being able to strike the appropriate balance between capital expenditure, operating and maintenance expenditure and demand management, to ensure the delivery of long term required levels of service to customers at the lowest possible cost. Accordingly, the forecast capital investment and the operating and maintenance expenditure requirements identified in the *NAMP* and in this *regulatory proposal*, are closely linked. This also involves exploring non traditional means of service provision, such as demand management and distributed generation services.

Country Energy has developed asset management practices, network planning criteria, and capital expenditure investment policies and guidelines for our employees to support the *NAMP*. These asset management practices ensure:

- Priorities are established in line with organisational objectives
- Financing and expenditure is planned and controlled in accordance with these priorities, and
- Resources are used as effectively and efficiently as possible so that the shareholder and the community receive the most value for the money spent.

Country Energy's work programs, expenditure forecasts and resource requirements for the remaining of the *current regulatory control period* and for the *next regulatory control period* are derived from the *NAMP*.

A copy of the *NAMP* is attached at Appendix E.

5.4.2 Legislation, Regulations and Codes of Practice

The standards to which the electricity network must be constructed, operated and maintained are contained in a number of Acts, regulations, and industry standards, codes of practice and guidelines. The main legislative, regulatory instruments and various codes of practices in NSW, Victoria and Queensland that impact on the management and operation of Country Energy's distribution network are covered in Section 4.5.2.

The preparation of the *NAMP* and the associated work programs are in compliance with the requirements of these relevant Acts, regulations, and the related codes of practice.

5.4.3 *Licence conditions*

On 1 August 2005, the NSW Minister for Energy imposed additional conditions on Country Energy's operating licence under the *Electricity Supply Act* 1995 (NSW) relating to design, reliability, and performance of electricity distribution network (*licence conditions*). Following a recent review, these conditions have been replaced with updated and revised conditions, with effect from 1 December 2007.

The purpose of the *licence conditions* is to facilitate the delivery of a safe and reliable supply of electricity and ensure that satisfactory levels of performance are achieved for all customers. The prescribed standards include:

- Minimum network design planning criteria
- Minimum average reliability standards by feeder category
- Minimum individual reliability standards by feeder category, and
- Guaranteed customer service standards requiring Country Energy to provide financial recognition to customers who experience poor reliability of supply.

Country Energy has been fully supportive of the introduction of the *licence conditions* as they encourage the achievement of improved levels of service performance for all customers and for those customers connected to the lowest performing feeders.

The *licence conditions* have a strong bearing on the asset management strategies adopted. Country Energy has published its network reliability, security and quality of supply standards in its document Electricity Supply Standard. The document conforms to the *licence conditions* requirements, regional classifications, and standards.

5.4.4 *The need for capital investment*

Capital investment is necessary to maintain the performance, safety, and integrity of the network. It is undertaken where the asset strategy indicates a need for asset acquisition, construction, renewal, or capacity augmentation.

Country Energy's capital investment program ensures:

- Long term sustainability of network condition, asset utilisation, supply security, and network performance
- Adequate capacity for customer connections and peak demand growth, achieved through either capacity augmentation of existing assets or the construction of new assets
- Timely replacement or refurbishment of ageing and obsolete assets that have become unserviceable, frequently fail in service, have deteriorated to an unsafe or risky condition, or where the present value cost of maintaining the asset exceeds the cost of replacement
- Satisfactory reliability and quality of supply compatible with the *licence conditions*, and to meet customer expectations for improved services
- Environmental, safety, infrastructure security and legal responsibilities are met
- Acquisitions of property and easements for future network development, and
- Availability of a number of miscellaneous corporate and non system items for the continued efficient management and support of the electricity distribution business such as information technology systems, motor vehicles and plant, and other non system assets.

The capital investment program proposed by Country Energy in this *regulatory proposal* is consistent with the delivery of the above outcomes. Country Energy is facing growing concern in terms of network safety and rising risks due to asset condition and ageing infrastructure, the expected improvements to security and reliability arising from its *licence conditions*, and the continued strong peak demand growth, which is expected to result in higher capital costs in the *next regulatory control period.*

5.4.5 *Corporate and capital governance*

Good corporate governance is fundamental to ensuring that funds are committed, and assets used, to optimise outcomes in a way which is appropriate, transparent and in line with the organisational strategy. At an organisational level good corporate governance is achieved in Country Energy through a cohesive, highly skilled and well disciplined Board, executive and senior management and a robust set of policies, procedures and structures. This strategic framework links corporate strategy to investment delivery via hierarchical dashboards measuring critical key performance indicators.

Electricity distribution is capital intensive requiring the application of rigorous and efficient capital budgeting and approval processes. Country Energy has a capital governance framework and processes in place to control capital (and operational) planning and expenditure, and to ensure that the intended program of capital works is delivered in a prudent manner. The governance of capital projects within Country Energy is based upon three key elements:

- Annual capital budgeting process
- Approval of capital expenditure in accordance with Country Energy procedural guidelines, and
- Capital governance structures and processes within the respective divisions to monitor capital expenditure.

The governance processes employed ensure a rigorous process for developing, prioritising and approving business plans in order to ensure the orderly development of the network.

The capital investment program is identified through rigorous annual business planning processes and selection of cost effective solutions that reflects the underlying network characteristics, condition and performance of Country Energy's assets, demand forecasts, service targets and compliance obligations.

All major investment opportunities and expenditures are reviewed. This process involves establishing the need, ensuring consistency with corporate objectives and the *NAMP*, and determining the least cost solution. Major projects are incorporated in Country Energy's annual Business Plan (part of its Statement of Corporate Intent), which is approved by Country Energy's Board.

A high proportion of the numerous smaller capital investments undertaken by Country Energy are non discretionary with limited available options. The review, approval, and implementation of these capital investments are undertaken by the regional management teams within the budget set in the approved annual business plan.

Capital project governance is achieved through a combination of capital reporting to the executives and capital governance structures within each of the respective business divisions.

Capital expenditure performance versus budget is monitored by Country Energy's executives through the following reports:

- Consolidated capital expenditure reports
- Divisional capital expenditure reports, and
- Divisional dashboards.

The current capital governance structure includes:

- Network Services Program Management Office (PMO) – governs network capital expenditure
- Corporate Services PMO – governs all capital expenditure related to the corporate services functions including information services
- Information Communication Technology (ICT) Council – governs all information services related capital expenditure across Country Energy, and
- Property Services Capital Works Review Panel – governs all property related capital expenditure across Country Energy.

The Network Services PMO oversees the management of major projects within the budget set in the approved business plan. The PMO tracks progress of current projects, undertakes post implementation reviews against original project plans, and reviews performance.

Business case preparation and approvals are governed by several Country Energy procedural guidelines.

Other key initiatives include:

- Improved capital expenditure monitoring and tracking
- Standardisation of capital budget reports
- Enhancing capital program and project reporting across Country Energy, and
- Consistent completion of post implementation reviews.

We believe that this governance process provides the necessary checks and balances to ensure that investments are prudent and efficient and that non network options are properly considered.

5.4.6 Asset investment planning, strategies and policies

Country Energy uses well developed and documented network planning processes. The development of sound asset management strategies are fundamental for prioritising and efficiently allocating capital (and operating) expenditure to projects that will lead to improved network performance and utilisation of assets in an environmentally responsible and safe manner.

Country Energy's intended capital expenditure program for the *next regulatory control period*, and key network asset management strategies are contained in the following plans, which integrate asset life cycle and risk management.

- *Capital Investment Strategic Plan* – This plan provides for the strategic development of the network and the medium and long term capital investment requirements of Country Energy to maintain adequate capacity and security of supply to meet customer needs. Key components of the capital investment strategic planning and related processes are documented in the Network Augmentation Management Plan, the Reliability, Quality and Security of Supply Management Plan and the Demand Management Strategic Plan, contained in the *NAMP*. These plans are supported by network planning criteria and capital expenditure investment policies and guidelines.

  The Network Augmentation Management Plan focuses on the provision of electricity network services to meet network growth in the medium to long term. The plan encompasses forward projections of peak demand and customer growth, and identifies the items on the network that are projected to exceed their limits and the subtransmission and distribution network development projects required. This aspect of planning also incorporates Country Energy's demand side management activities aimed at containing or reducing the customer load presented to the network and also involves specific developments to maintain security of supply.

  Country Energy engages in market based development of options for electricity system support, and their evaluation at the same time and in the same manner as network investments. These processes involve significant consultation as described in the Demand Management Strategic Plan. The decision to apply demand management or to augment the network always remains an issue of economic efficiency, technical feasibility, timing, service preferences, application of sound industry commercial practice, and determining the optimum means of providing supply capacity to customers.

These processes involve significant consultation. An annual Electricity System Development Review (ESDR) report is prepared and published. This document provides historical and forecast peak load data and capacity information for all zone substations and discloses where a network constraint is forecast to occur within 5 years. The information allows customers and energy service providers to consider whether they may be able to assist in addressing the network constraint through the implementation of demand management. This approach actively seeks to minimise barriers and disincentives to the adoption of particular demand management options. The ESDR is attached at Appendix J.

The Reliability, Quality and Security of Supply Management Plan address the supply reliability, quality and security aspects of Country Energy's electricity distribution network business. It details the specific asset management strategies, commitments, actions, and the level of expenditure aimed at ensuring that supply reliability, quality and security is compatible with the *licence conditions*, and to address identified customer requirements.

The planning process produces a detailed annual capital expenditure program and sets priorities for capacity augmentation, and supply security, quality and reliability over the investment horizon to 2013-14.

- *Asset Renewal Management Plan* – This plan focuses on asset management strategies reflecting the condition, serviceability and age of Country Energy's network assets, life extension practices, asset refurbishment and replacement, actions required for recurring faults, and compliance with statutory requirements. The plan includes detailed asset by asset strategies and plans. It identifies the need to monitor the condition and performance of network assets. This plan is particularly important, given the size and in service condition and age of system assets owned and operated by Country Energy.

- *Asset Maintenance Management Plan* – Further information on Country Energy's intended asset inspection, vegetation control, and maintenance programs for the *next regulatory control period* is provided in Section 4 of this *regulatory proposal*.

- *Asset Life Cycle Management* – Country Energy has adopted a life cycle approach to the management of its assets. This approach allows Country Energy to optimise the utilisation, operation, maintenance and renewal of each asset class and its constituent elements. The replacement of long life assets will generally require the asset planner to analyse the life cycle costs for new equipment against the marginal cost of maintaining the existing equipment. However, in the majority of cases, the risk of potential failure with major safety, environmental and reliability implications is the main driver for replacement without the need for this degree of economic precision.

- *Risk Management* – A key component of the *NAMP* is risk management. Country Energy's policy on risk management is such that risk is measured by the combination of probability and consequence of failure, and determining a particular level of risk that is acceptable. Country Energy risk management policies adopt the approach described in *AS/NZS 4360:2004 Risk Management*.

  Country Energy pays particular attention to risk management and its relationship to network asset safety and reliability performance. It has adopted different risk profiles for different asset classes, particularly for asset inspection and maintenance and asset renewal requirements. For example replacement may occur earlier for assets with a high risk profile such as power transformers and zone substation equipment as compared to less critical components. The risk policies and practices are captured in each of the asset management strategic plans and in the forecasting process.

The *licence conditions* set out the design planning criteria to be used by Country Energy in planning and developing its subtransmission network, zone substations, and primary distribution networks to ensure that it meets with an appropriate level of redundancy, dependent upon the load and the time required to restore supply.

- *Integrated regional network planning, budgeting and works programming* – One of the main purposes of network planning is to ensure an optimal balancing of capital and recurrent expenditure, so that maintenance, replacement and augmentation of the electricity distribution network delivers the required level of services at the lowest possible cost.

  Country Energy's centralised network strategy management group and the regional network planning groups develop efficient capital and maintenance work programs based on the requirements of the *NAMP*, *licence conditions*, the standard organisational wide policies and procedures, complimented by local regional requirements relating to customer driven needs and the state of the local network.

  The regional structure, working together with the network strategy group, has resulted in the ownership of local reliability and quality of supply improvement initiatives, including the task of selecting feeders for remediation and the improvements required. Country Energy believes this approach is best practice given the operational needs of its network.

  An efficient works management process balances resource availability with the needs of the network. Projects and programs are targeted and prioritised for completion to deliver the best outcomes for the business and its customers. Capital works may involve the use of internal resources or competitive tendering.

- *Network planning criteria* – Network planning criteria is a combination of standards applied by Country Energy to review and plan the network for future load growth to achieve the required level of system security, reliability and quality of supply.

  Network planning criteria is established for the following items:

  - Permissible loading capacities of plant and network components under normal and emergency conditions
  - Permissible voltage regulation limits
  - Equipment selection, and
  - Appropriate security of supply for the network.

  Planning criteria differs across asset classes, feeder categories, voltage levels and location reflecting the different conditions and equipment in service.

  The planning criteria is detailed in Country Energy's documented Subtransmission and Distribution Network Planning Criteria and Guidelines, which is consistent with the *licence conditions*, accepted international practice and published Australian standards. The document provides an objective framework within which network development can be planned, and against which overall security levels can be assessed.

  For subtransmission powerlines and zone substations supplying loads in excess of 15 MVA, a form of deterministic N-1 criterion is applied in accordance with the *licence conditions*, adopting a risk management approach to the potential overloading above thermal current rating. Under this planning philosophy, the design parameters for a strict deterministic N-1 criterion are relaxed depending on an assessment of load at risk and the allowable loading above thermal capacity, for a short duration in some situations, for the chance of failure of a major piece of equipment that coincides with the peak demand. The maximum forecast demand is not to exceed the thermal current capacity for more than 1 per cent of the time, up to a maximum of 20 per cent above the thermal capacity under N-1 conditions.

For long radial rural parts of the network, the N-1 philosophy is not fulfilled for radial subtransmission powerlines, due to the significant capital expenditure requirement.

The planning criteria for the distribution network generally focuses on feeder augmentation works to provide supply to new or growing loads, maintain adequate voltage regulation, maintain security and reliability of supply, upgrade thermal capacity, and minimise system losses. The availability of alternative supply in the distribution network is a function of load density and geography. In general, urban networks enjoy a high level of redundancy as a result of meshing of the network whereas rural networks do not.

For regional centres, the design planning criteria for high voltage distribution feeders in the *licence conditions* requires Country Energy to maintain an N-1 planning policy. This requires the loading on high voltage distribution feeders, under system normal operating conditions, to be limited to a peak demand utilisation of 80 per cent of the thermal design (normal cyclic) rating. With the loss of load, for a single credible contingency, supply can be restored by switching the load of an out of service feeder to four healthy adjacent feeders that can then be loaded to 100 per cent of thermal capacity, enabling the maximum number of customers to remain on supply.

- *Consultation with transmission network service* providers – Country Energy connects to the interconnected national transmission network through the assets owned and operated by the transmission network service providers in NSW and Queensland. The interaction between Country Energy's subtransmission network and the upstream transmission network is critical to the efficient operation of both.

  The *Rules* and the connection agreement between Country Energy and the transmission network service providers, requires regular joint planning consultation and review. The focus of joint planning is ensure the capability of the existing transmission connection points to meet expected peak loadings, and the need for augmentation to connection point capacity or to provide a new transmission connection point.

  There are occasions where a forecast load increase could be met by a transmission network development option, a Country Energy network development option, a joint development option, or through the implementation of demand management or installation of embedded generation. Consultation with interested parties is undertaken as part of the process. The recent joint planning approach to emerging constraints in north eastern NSW, including an option to construct a new 330 kV powerline between Lismore and Dumaresq, is an example of this consultative process.

  In the planning stage, Country Energy takes into account any proposed transmission capital investment projects relevant to its network, which have been identified in transmission network development plans.

- *Policies and procedures* – Country Energy has capital investment policies and procedures in place. Two key policies impacting on forecast capital expenditure are discussed below. Country Energy's capital investment policies and procedures will be provided separately to the *AER* and its consultants as part of the requirements of the *regulatory information notice*.

- *Capital investment appraisal policy* – The need, evaluation and approval of capital investment options are carried out in accordance with policies and procedures. Country Energy's system investment appraisal guidelines are aligned with the NSW Government's TAM policy and guidelines. This ensures a consistent approach to investment evaluation depending upon the strategic significance, scale, characteristics, and risk involved. This is crucial to the process of decision making and ensures that network management identifies the option which maximises the benefits to customers, employees, the shareholder and all other stakeholders over the life of the project.

- *Capitalisation policy* – Some judgement is necessary to decide whether a particular expense should be treated as capital or maintenance. Country Energy's approach is not overly prescriptive and ensures that the treatment of a renewal is cost neutral in the long term. The assessment of whether expenditure is capital or maintenance is performed at the component asset level. All non system assets in excess of $600 are treated as capital expenditure. System assets are capitalised in the following circumstances:
  - If the asset being replaced is at the end of its useful life
  - If the replacement asset increases service capacity, service quality or extends the service life of distribution assets beyond what was expected when originally installed, and
  - Works on a feeder, or parts of feeders, or group of assets that involves the rectification of a concentrated number of identified defects or minor projects packaged together to form a single piece of work

  The last category may include replacement of poles, pole top components, or conductor, which extend the original life of the asset (in this case the overhead distribution powerline) beyond that expected when the powerline was first constructed. All other expenditure incurred in maintaining, but not increasing, the operational capacity or life of the components of the distribution system is expensed in the period incurred as maintenance expenditure. Examples include vegetation management, overhead powerline maintenance, ground powerline and aerial inspection, and pole preservation treatment.

5.4.7 Resources

An efficient works management process balances resource availability with the needs of the network. Resource constraints have not occurred in the *current regulatory control period* due to recruitment and retention programs, use of external contractors and improved logistics. Country Energy utilises a mixture of internal and externally contracted labour resources, which are acquired through competitive tendering, to undertake the capital investment (and maintenance) program. Striking an appropriate balance will ensure long term reliability of supply.

The retention of skill levels is of vital concern and Country Energy seeks to strike a balance between the use of internal technical expertise and contracting external services in order to retain ongoing knowledge of the assets.

Internal resources are generally retained for internally funded distribution capital works. This resource has been multi skilled and developed to cover a range of functions in managing a rural electricity network including core maintenance, fault finding and repair functions.

The internal resources are supplemented to handle peak work demands. There are a number of contracts in place for externally contracted services including:

- Subtransmission powerline design, construction and project management, and
- Zone substation design, construction, and project management.

Quality checks are made using the contractors' reports, from actual work undertaken, and by Country Energy employees who supervise the work.

Country Energy has a resource plan to deliver an expanded, efficient capital expenditure program, by alleviating resource constraints during the *current regulatory control period*. Country Energy has already commenced this process, identifying constraints and implementing mitigation strategies in the areas of internal and external human resources, and logistics.

During the *current regulatory control period* Country Energy has demonstrated its capacity to increase resource availability through:

- Recruiting and building an adequate mix of internal and external resources to complete the required works
- Internal employees growth strategies through intakes of new apprentices covering a wide range of disciplines, technical trainees, and engineering graduates
- Active targeting and recruitment of qualified trade people and technical support employees from other related industries, interstate and, wherever possible, overseas distributors, and those apprentices completing their time in other companies
- Innovative approaches to training, internal employee development strategies, and activities to develop the necessary skills required to deliver the works program
- Competitive wage rates to maintain high employee retention rates and attract potential employees
- A structured approach to contracting external specialised services through publicly tendered contracts such as zone substation works, identifying those specific work areas where external support is required, development of strategic relationships with external service providers to enable improved matching of resource requirements to program resource demands, and the adoption and mobilisation of these resources to supplement peak work demands
- Ensuring that internal contract management resources are in place to effectively manage the increases in project work undertaken by external service providers
- Enhanced purchasing ability through material standardisation, longer term contracts with suppliers for key material and equipment, and more effective management of inventory including the ability to increase inventory levels when required
- Increased availability of motor vehicles and heavy plant fleet, and
- Improvements to the governance framework for capital investments.

Many of these resource programs and initiatives are already well advanced as evidenced by higher employee levels obtained since Country Energy's formation. The actions taken to date to meet this increased workload have laid the foundation for developing and procuring adequate resources into the future.

5.4.8 Key capital investment challenges for the future

There are a number of issues that have been identified by Country Energy that need to be addressed as a priority for the remaining part of the *current regulatory control period* and moving forward into the *next regulatory control period.* The challenges faced by Country Energy are characterised by factors that are common to the electricity distribution industry, as well as factors that are a function of the unique nature of its network and geography.

Country Energy's broad medium term objectives for strategic investments are:

- Keeping pace with base growth to ensure Country Energy's network has adequate capacity to meet additional load
- Maintain capital productivity through prudent future network investment decisions and asset utilisation
- Identify areas of the network where demand has exceeded the capacity of the existing network to supply the load at a satisfactory performance level
- Identify areas of the network where the network design planning criteria has been exceeded and carry out demand management studies to identify whether augmentation or load management will provide a more economical solution
- Maintain long term sustainability of network capacity, security, and network performance through the capacity augmentation/reinforcement of existing assets or the construction of new assets

- Address network augmentation challenges through innovative solutions, ensuring customers continue to benefit from the most cost effective solutions
- Maintain long term sustainability of network condition through refurbishment or replacement of ageing network assets where acceptable standards of serviceability, failure rate, condition, or where the cost of maintaining the asset has exceeded its annualised replacement cost
- Refurbish or replace assets that have been identified as presenting an environmental hazard, or present a safety or security risk
- Satisfactory compliance with *licence conditions*, and to meet customer expectations for improved services including identification and remediation of poor performing areas of the network that do not comply with the *licence conditions* relating to minimum and average reliability standards or industry acceptable quality of supply standards
- Review and implement a range of load control and new technology initiatives to improve the level and cost effectiveness of service provision, and
- Ensure the availability of crucial non system investments for the continued efficient management and support of the electricity distribution business.

Country Energy believes that its asset strategies and work practices meet efficient capital investment requirements. The ongoing challenge for Country Energy is to meet its service and compliance obligations in an environment where future work undertaken on the electricity distribution network will need to be targeted towards asset condition, addressing network safety issues, reducing potential risk of an ageing asset base and meeting growth requirements.

5.5 Key assumptions

This section describes the key assumptions underlying the capital expenditure forecasts that have been certified in accordance with provision S6.1.1(5) of the transitional *Rules*. The certification statement is attached as Appendix B.

Further details on these key assumptions are covered throughout Section 5 and Pro forma 2.3.3.

5.5.1 Efficient Base Year

Country Energy has used the 2006-07 financial year as the base for forecasting future costs. The 2006-07 year is the latest year where actual audited regulatory accounts are available.

Country Energy has a commercial incentive to achieve an efficient level of expenditure, while meeting service expectations and regulatory obligations, recognising the non discretionary nature of a high proportion of expenditure.

The commercial incentives that have influenced expenditure decision making and conduct over the *current regulatory control period* (including 2006-07 financial year) include:

- Country Energy must ensure that capital is prudently invested in order to meet shareholders' expectations.
- Country Energy has generally adopted an approach of competitively tendering for contractor engagements for the vast majority of zone substation and subtransmission line related capital works to independent third parties, which ensures capital expenditure is undertaken on a least cost basis.
- *RNSPs* are required to undertake a market based approach to consideration of non network alternatives and the most efficient means for addressing emerging network constraints.

The capital investments made by Country Energy in the *current regulatory control period* have been necessary to maintain reliability, safety and security. Country Energy believes that its 2006-07 expenditure outcomes provide an efficient base level from which to forecast future expenditure requirements.

The forecasting methodology employed by Country Energy uses a mixture of detailed 'bottom up' analysis of major projects to be completed (particularly at the subtransmission network level), projections of historical expenditures particularly for some classes of distribution network asset classes, and the expenditure requirements of new capital investment programs.

5.5.2 Demand Forecasts

Country Energy has adopted a formal methodology to forecast energy consumption, demand and new customer growth. This work has been supported by external expertise. National Institute of Economic and Industry Research (NIEIR) was engaged for this price review to research and provide advice on forecasts of key economic parameters that may influence the demand for electricity, and to prepare growth forecasts for the Country Energy region over the *next regulatory control period*. Further analysis of the NIEIR projections was carried out by Country Energy.

The forecasting methodologies are theoretically sound and proven, and have been employed throughout the electricity industry for some time. The methodology employed by NIEIR centres on the use of their national, state and regional economic and electricity forecasting models. The methodology is top down where the economic outlook for Australia is allocated between the states and then different regions within each state.

Peak demand, particularly summer peak demand, is a principal driver of growth related capital expenditure. Growth in customer connections also drives this category of capital expenditure.

Country Energy's demand forecasts are based on the best information currently available. The process involves a detailed analysis of growth forecasting inputs, including:

- Historical peak demand, customer numbers, and energy patterns
- Expected drivers of future growth such as population and housing dynamics, national and regional economic outlook
- Local knowledge attained through a close working relationship with developers and local planning authorities
- Identification of known major developments including an assessment of the likelihood of future large 'spot loads' particularly in the industrial and mining sectors
- Consideration of seasonal and yearly patterns, and
- Likely influences of demand side management initiatives, embedded generation and cogeneration.

Country Energy has assumed for its capital expenditure forecasts that the rate of new connections and peak demand growth aligns with a base growth scenario.

The projected growth of energy consumption, customer numbers, and demand across the network for the *next regulatory period* is:

- Electricity consumption to grow by 1.56 per cent per annum
- New electricity customer connections to grow by 1.46 per cent per annum, and
- The average annual rate of growth in summer and winter peak demand for the whole of the network is expected to be 3.0 per cent and 1.8 per cent per annum respectively under the base growth scenario over the period to 2013-14. Over a 10 year period to 2017-18, the corresponding growth rates for summer and winter peak demand is expected to be 3.4 per cent and 2.0 per cent per annum respectively.

The forecast for residential and business customers are as follows:

Percentage increase	Overall	Residential	Business
Energy Consumption	1.56	1.36	1.70
Customer Connections	1.46	1.48	1.30

Table 5.3: Forecast for residential and business customers

The basis for choosing this base scenario and the methodology used in developing these demand growth forecasts is described in Appendix F of this *regulatory proposal*.

5.5.3 Licence conditions

On 1 August 2005, the NSW Minister for Energy imposed additional conditions on Country Energy's operating licence under the *Electricity Supply Act* 1995 (NSW) relating to design, reliability, and performance of electricity distribution network (*licence conditions*). Following a recent review, these conditions have been replaced with updated and revised conditions, with effect from 1 December 2007.

The purpose of the *licence conditions* is to facilitate the delivery of a safe and reliable supply of electricity and ensure that satisfactory levels of performance are achieved for all customers.

Country Energy has been fully supportive of the *licence conditions* as they encourage the achievement of improved levels of service performance for all customers and for those customers connected to the lowest performing feeders.

The *licence conditions* have a strong bearing on the specific asset management strategies adopted. Reliability improvement related expenditure is required to meet these requirements and increasing expectations. Expenditure forecasts have been derived from rigorous and detailed analysis models for reliability improvement.

5.5.4 Asset condition assessments

Asset condition assessments are a key input into the development of Country Energy's asset renewal and replacement programs for subtransmission and distribution assets. Condition assessments are used as a primary information tool in evaluating and understanding network system assets, ensuring adequate levels of compliance with statutory obligations and maintenance of our duty of care.

Details of the asset condition assessments for relevant system assets classes and the specific concerns, strategies and programs are described in the *NAMP*.

5.5.5 Asset age profiles

Asset age profiles are an important checking mechanism to confirm the sound development of asset replacement and renewal strategies and expenditure forecasts. They have been used to develop age based replacement profiles for major asset classes, which in turn have been used to check the asset renewal expenditure forecasts derived from asset condition assessments, risk, and the implementation of specific asset renewal programs and initiatives. The asset age profiles are also used to determine work volumes for the subtransmission and high voltage distribution overhead powerline renewal program due to the impracticality of undertaking condition based assessment for these assets.

Sinclair Knight Merz (SKM) was engaged by Country Energy to assist in undertaking an assessment of the current total replacement cost of the entire system assets and each major asset class (refer to Appendix M). An up to date, accurate total replacement cost valuation of the entire system assets can be employed to provide a broad assessment of the reasonable range of growth related and asset renewal capital expenditure requirements. The use of the total replacement cost valuation in this manner can provide the *AER* with confidence in the methodology used by Country Energy to derive the capital expenditure forecasts.

5.5.6 *Network Asset Management Plan (NAMP)*

Asset management covers the processes for planning, development, operation, inspection, condition assessment and maintenance of all components of the electricity network. The establishment of sound asset management system and processes are a prerequisite for prudent and efficient capital and operating expenditure.

Country Energy prepared the *NAMP* as a means of strategically managing physical system assets to best support the delivery of network services to all connected customers over the planning horizon to 2013-14. It describes the asset management policies, strategies, plans and practices of Country Energy. The objective of the *NAMP* is to maximise the technical and financial performance of the network for all stakeholders and to consistently provide customers with high quality, safe and reliable network services, at the lowest possible price, while preserving the value of public assets.

5.5.7 *Cost estimation – unit rates*

Capital expenditure forecasts are particularly sensitive to unit rates assumed for the construction of new assets. Country Energy has calculated all of the unit rates applying to network capital expenditure program using its estimating system. Country Energy uses its standard estimating system unit rates for the costs of external contracting work undertaken by Country Energy in the competitive construction market, and for internally funded capital expenditure. This system is used to develop the schedule of unit rates for external contracting work undertaken by Country Energy in a competitive construction market and for internally funded capital expenditure works. The schedule of rates are very detailed, as the software allows the rates to be constructed to the lowest levels, including detailed material items and costs, labour hours and rates, labour on costs and indirect cost allowance.

Capital works unit construction rates must include the full costs of construction, including direct costs and a full allowance for associated indirect or overhead costs. Capitalised overheads are operating expenses incurred by the business that are not directly allocated to capital projects. If these costs are not recognised as capital, then they would be included in the operating expenditure allowance as they are legitimate costs in running a network business.

SKM was engaged to prepare unit rates independent of Country Energy (refer to Appendix M). The unit rates developed by SKM do not capture all relevant indirect and overhead costs involved by Country Energy in the construction of new works. It is necessary to include a sufficient allowance for other corporate overheads that the Country Energy distribution business must incur such as corporate governance and asset ownership. Accordingly, the unit rates used by Country Energy include all applicable corporate and divisional overheads.

Country Energy submits that its current unit costs are efficient and competitive with respect to the market and other similar utilities.

As noted by SKM, there are a number of costing errors in the unit rates adopted for the purposes of the *IPART Determination*, which need to be reviewed in light of realistic construction costs. Country Energy's unit rates are, in practice, much higher for a number of differentiating factors including, but not limited to:

- Cost of compliance with legislative and regulatory requirements, such as workplace health and safety, environment, traffic control and site security requirements, since 2001
- Greater congestion and crowding of easements and road reserves
- Higher proportion of capital works now being conducted in brown fields locations
- Recent significant increases in cost of employment and construction materials, and
- A host of other recent cost imposts that have been imposed on the distribution business, which are not reflected in the Treasury Guidelines unit rates that were derived in 2001.

5.5.8 *Cost estimation – labour and materials cost escalation*

Material and labour cost increases have been strong in the *current regulatory control period* and this is expected to continue into the future. Labour and material costs used to develop the capital expenditure forecasts in this *regulatory proposal* are assumed to remain constant in real terms. However Country Energy supports an approach of including a provision for rising labour costs and material costs within both the operating and capital expenditure forecasts. Country Energy engaged CEG to research and provide escalation trends in labour and materials for the *current* and *next regulatory control period* (refer to Appendix C). The report calculated a weighted average real increase in labour and material costs used to develop the capital expenditure forecasts of 1.2 per cent.

5.6 Forecast capital expenditure – overview

Country Energy is proposing that the capital investment activities for the *next regulatory control period* would be undertaken as outlined in Section 3. The investment program will be generally consistent with current work programs, albeit with a higher resource requirement for the implementation of the new specific work programs, in order to continue to support the core functions of the electricity distribution business.

Country Energy has developed a detailed capital expenditure program. The program is in accordance with sound industry practice and realistic asset management plans and strategies, taking into account the following factors:

- Needs of our customers and all other stakeholders
- *Licence conditions* relating to reliability and security of supply including targeting parts of the network that are delivering the lowest service levels
- Independently assessed forecasts of growth
- Condition and age of distribution system assets
- Environmental, safety, security and legal compliance requirements
- Non system asset requirements, and
- Alternatives to capital expenditure including operating expenditure, efficient demand side management and embedded generation.

Country Energy is seeking an increased level of sustainable expenditure in order to deliver the intended capital work programs. Country Energy's forecast of capital investments relating to *standard control services* for the *next regulatory control period*, assuming a medium growth scenario, is summarised in the following table.

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Total system capital expenditure	584	642	675	699	725
Total non-system capital expenditure	168	137	136	137	138
TOTAL CAPITAL EXPENDITURE	**752**	**779**	**811**	**836**	**863**

Table 5.4: Forecast total capital expenditure requirements for *standard control services*

System related capital expenditure increases from $584 million in 2008-09 to $725 million in 2013-14. Total capital expenditure requirements, including non-system investments, increases from $752 million in 2009-10 to $863 million in 2013-14.

Country Energy has the ability and the capacity to fully resource its expenditure proposals in a properly planned and efficient manner.

The proposed capital expenditure program will result in our customers continuing to receive a highly reliable, safe, secure, value for money and quality service. The substantiation of the forecast capital expenditures are provided in the following sections.

5.6.1 Methodology to forecast capital expenditure

System related capital investment covers all system assets comprising the network. Capital investment is undertaken where the asset strategy indicates a need for asset acquisition, construction, renewal, or capacity augmentation. In line with these requirements, capital expenditure can be broken down into a number of categories. Key components of the strategic planning process for each category are set out in the individual asset management plans contained in the following sections of the *NAMP*:

- Network Augmentation Management Plan (Section 5)
- Demand Management Strategic Plan (Section 6)
- Reliability, Quality and Security of Supply Plan (Section 7), and
- Asset Renewal Management Plan (Section 8).

The capital investment program is identified through a rigorous annual business planning process and the selection of cost effective solutions that reflects the corporate strategy objectives, the underlying network characteristics, condition and performance of Country Energy's assets, demand forecasts, service targets and compliance obligations.

Country Energy's expenditure forecasts are substantiated through:

- Application of robust engineering models that predict aggregate asset replacement and distribution network growth related capital expenditure requirements, based on an analysis of asset condition, risk and age, and forecasts of growth
- A 'top down, bottom up' cost approach for specific network classes and individual subtransmission projects
- Examination of the main drivers of changes in expenditure for the *next regulatory control period*
- Comparison with historical expenditure requirements, and
- Efficient quantities and unit prices.

Country Energy has applied a pragmatic and rigorous 'bottom up' approach to the analysis of major projects, typically at the subtransmission network and zone substation level, and for some areas, at a high voltage distribution feeder level, using the best available information, detailed planning and the application of risk management techniques.

Expenditure at the distribution network level is generally assessed using a 'top down' approach that considers the necessary aggregate investment requirement across broad network asset classes and for different drivers.

These are then drawn together and any synergies identified where a particular investment might meet a number of identified needs.

The forecasts have also been prepared on the basis that current technical standards and accepted sound industry practice will continue to apply during the *next regulatory control period.*

The expenditure forecasts have been incorporated into the relevant pro forma required by the *regulatory information notice*.

We would welcome the opportunity to discuss in detail with the *AER* and its advisers the development of the capital program and forecast expenditure.

5.6.2 Cost allocation method

The capital expenditure forecasts contained in this section have been derived utilising the cost allocation method approved by the *AER* on 31 March 2008. In compliance with the *regulatory information notice*, IPART has forwarded the audit reports for Country Energy's regulatory accounts to the *AER*, confirming that IPART accepts Country Energy's cost allocation methodology to be accurate.

5.6.3 Capital expenditure categories

Country Energy's capital investment programs have a relationship to activities that the distribution business has carried out in the past. The following table lists the categories of capital expenditure for the *next regulatory period* and provides a brief description of each.

Some capital investment projects may have multiple drivers. However while there may be inter-relationships between categories, there is no overlap between the capital investments programs detailed in this *regulatory proposal*. The details for each category, the intended work programs, the methodologies employed to determine efficient expenditure levels and related supporting analysis are set out in the next few sections. Section 5.12 summarises the forecast capital expenditure for *standard control services*.

Category	Description
Growth	This ensures that the network has sufficient capacity to meet additional load. Additional load can require capacity augmentation/reinforcement or the construction of new assets in order to maintain existing levels of system performance and supply security.
Asset renewal	Expenditure in this category will ensure the timely refurbishment and/or replacement of network assets that are aged, unserviceable, frequently fail in service, deteriorated to an unsafe or risky condition, or where the present value cost of maintaining the asset exceeds the cost of replacement.
Environmental, safety, security and legal	Asset renewals are also necessary due to environmental, safety, infrastructure security and legal requirements. Capital expenditure in this category has the purpose of reducing the anticipated number and severity of related incidents.
Reliability and quality related	The aim of this expenditure is to decrease the service gap between rural and urban customers by continuing to invest in the innovative actions to improve system wide supply reliability and quality, and in poor performing parts of the network.
Non system	This expenditure will ensure the continued efficient management and support of the electricity distribution business through expenditure related to information systems, telecommunications systems, motor vehicles and heavy plant, land, building and property works, and smaller related expenses.

Table 5.5: Capital expenditure category summary

The characteristics of the different categories above necessitate different forecasting approaches and these are detailed within the relevant category expenditure forecast sections.

5.6.4 *Capital expenditure forecasting limitations*

Country Energy operates under an incentive based regulatory framework designed to provide the commercial incentives to achieve service and compliance obligations over the course of the *regulatory period* at efficient cost. Each *regulatory control period* should be considered separately in forecasting capital expenditure requirements as it is necessary to take into account a range of factors and cost drivers that may not necessarily reflect historical expenditure or trends, including but not limited to:

- Services to be delivered and outcomes to be achieved
- Changes in circumstances such as future network growth
- Changes in obligations, standards or functions
- Changes in asset management policies and strategies
- Condition, age and utilisation of network assets
- 'Lumpiness' of individual capital projects such as the construction of new major network assets, new plant, or the replacement or augmentation of information technology systems
- Implementation of new work programs, and
- Changes in cost structures.

The levels of expenditure on these items can vary significantly from year to year. It is necessary for the forecasts of capital expenditure to be based on the best information available.

5.7 Forecast capital expenditure – growth

Growth related capital expenditure is essential to ensure that Country Energy's network has adequate capacity to meet additional load. Additional load can cause the existing assets to operate at higher than acceptable ratings and levels of utilisation requiring capacity augmentation or the construction of new assets, in order to maintain existing levels of system performance and supply security. Augmentation works can be sizeable involving the construction of new zone substations, subtransmission powerlines, and major high voltage distribution feeders.

This 'core' program is undertaken in conjunction with other ongoing programs, such as the asset renewal and maintenance programs, and ensures that a reduction in network performance is not the result of insufficient network capacity. The program has a secondary impact on improvements in supply quality through improvements in voltage regulation.

The need for growth related capital expenditure is established by assessing the capability of the network to meet new load and peak demand. Time lags between drivers and actual investment, and the amount of risk accepted by Country Energy, also have a major bearing on the amount of capital per unit of growth.

The internally funded growth related capital expenditure forecasts (excluding capital contributions) derived from Country Energy's network planning processes, assuming a medium growth scenario, for the planning period to 2013-14, are provided overleaf.

Growth ($M 2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Sub-transmission lines and cables	70	77	82	85	88
Distribution lines and cables	72	80	85	88	92
Substations	54	60	63	66	68
Transformers	19	21	22	22	23
Low Voltage Lines and Cables	6	7	7	7	8
Customer Metering and Load Control	4	4	5	5	5
Communications	0	0	0	0	0
- Land	4	5	5	5	5
- Easements	19	21	23	23	24
Total - system capital expenditure	**249**	**275**	**291**	**302**	**314**

Table 5.6: Forecast of growth related capital expenditure for 2009-10 to 2013-14

Forecast internally funded growth related capital expenditure (excluding capital contributions) is estimated to average around $286 million per annum over the planning period to 2013-14.

The core growth related expenditure program does not include the distribution reliability and quality of supply improvement programs designed to meet the requirements of the *licence conditions*. However, the growth related program provides a stable platform for additional expenditure to achieve the necessary performance improvements.

5.7.1 Growth forecasting methodology

The methodology used to develop the forecast of growth related capital expenditure provided in this plan is founded on the knowledge of future peak demand growth, customer growth and general load patterns in each particular part of the network separately, and the analysis and consideration of the main drivers of growth related investments and the programs to be implemented to 2013-14.

Country Energy has developed its expenditure forecasts using a combined 'top down, bottom up' approach. A detailed 'bottom up' program of work has been developed for projects for subtransmission powerlines and zone substations and, for some areas, at a high voltage distribution feeder level. Expenditure at the distribution network level is assessed using a 'top down' approach on the basis of the projected rate of growth in customer connections, historical expenditures and average replacement costs per asset class.

Country Energy has offset its calculated growth related capital expenditure by the portion of capital expenditure undertaken under other asset management categories, such as asset renewal, with the secondary purpose of capacity augmentation.

The expenditure projections are based on Country Energy's own unit cost estimates to complete new works noting that, in some cases, part of the work that will be undertaken is bid competitively and part is undertaken by an internal party.

The veracity of the modelling rests on the suitability of the input assumptions made. The results are particularly sensitive to the assumed rates of growth in demand and customer connections. They are also sensitive to the unit costs assumed for the construction of assets.

Country Energy's approach to forecasting growth related capital expenditure is fair and reasonable and in accordance with industry practices. The modelling is sufficiently robust, and the forecasts for growth related capital expenditure are sufficiently supported.

In all cases, the potential use and cost of demand management and embedded generation are considered in reducing the need for investment in additional network capacity. Generally, the impact of demand management has been to influence the timing of augmentation projects.

- *Load forecasting*

  A key element in the methodology is a reliable forecast of peak demand and customer connection growth, and the analysis of loading trends and patterns over the planning horizon.

  These growth forecasts are utilised to identify areas of future network constraints, making it possible to define a staged development program for the medium to long term. Load modelling can also assist in determining the effect of potential demand management strategies, such as peak lopping, demand shifting, and distributed generation and cogeneration developments.

  Country Energy follows a well documented process to monitor and predict load growth and maximum demand at various asset levels. To counter the effects of any inaccuracies in the forecasting process, annual reviews of load forecasts are undertaken.

  Several levels of forecast are derived by Country Energy, including:

  - Country Energy whole of network aggregation
  - Transmission connection points
  - Zone and subtransmission substations
  - Local subtransmission network area aggregations, and
  - Major distribution feeder areas, as necessary.

  In the development of the ESDR, Country Energy prepares summer and winter peak demand forecasts aligned with a medium economic growth scenario, 50th percentile, and extended over a planning horizon of five to ten years at a zone substation and subtransmission substation level.

  The peak demand forecast covers both peak summer (December to February) and peak winter (June to August). Forecasts are prepared for the 50th percentile in terms of summer and winter peaks as well as each economic growth scenario. The 50th percentile forecast for peak demand is intended to reflect the most probable scenario for average weather (temperature) conditions. It conservatively recognises an equal probability of actual demand exceeding or falling short of the forecast, that is, the forecast will be exceeded once very 2 years.

  Peak demand particularly summer peak demand, rather than energy consumption, is the key issue for network capacity particularly when annual load factors are decreasing over time. However, peak demand can be a difficult parameter to forecast and varies to some extent from region to region. Annual peak demand forecasts are prepared and published in the annual ESDR.

  These forecasts are also utilised as inputs into annual planning reviews and forecasts prepared by transmission network service providers for each transmission point of connection. The internal projections are supported by independent forecasts for base, high and low economic scenarios produced by NIEIR for Country Energy. The NIEIR report is attached at Appendix G.

- *Subtransmission powerlines and zone substations*

  The expenditure forecast for these network classes has been based on a pragmatic and rigorous 'bottom up' planning approach to the analysis of future capital expenditure requirements.

The process involving the application of a planning methodology and the best available information, which includes:

- consideration of legislative, regulatory and related codes of practice requirements
- analysis of current loading levels and predicted load growth
- results of network planning studies
- application of documented planning criteria
- identification of network constraints
- identification of augmentation and demand management options
- cost benefit assessment
- assessment of historical expenditures, and
- unit construction cost rates.

Each individual subtransmission network and zone substation augmentation project is identified, scoped, costed, and treated on its own merits.

Demand forecasts provide the source data for system load flow analysis, which enables the analysis of existing installed capacity, security, identification of network constraints, time to capacity limits being exceeded, utilisation of individual plant items, and the future requirements and configuration of the subtransmission network and zone substations. This information is then used to predict the most technically acceptable solution and the cost of augmentation to meet the peak demand growth and overcome any network limitations. Commercially available power systems analysis software and other engineering tools for planning and design work is used for this purpose. In line with industry practice, Country Energy's network augmentation and reinforcement decisions are based on assessing projected security levels for a forecast peak demand at the base economic condition and 50 per cent PoE.

Most augmentation or reinforcement plans are initiated by technical reasons or network constraints, including:

- voltage regulation cannot be maintained within specified limits
- thermal rating of system equipment (transformer or powerline) is exceeded
- fault rating of plant is exceeded
- ageing of plant due to loading, mechanical and/or electrical stress makes continued operation uneconomic
- inability of existing network to supply a new or increased load
- acceptable standards of security cannot be maintained or are not provided
- reduction in the reliability or quality of supply, and
- demographic changes which cause assets to be relocated or rebuilt to meet a new power carrying requirement.

These limitations are assessed within the design planning criteria. This planning process produces a detailed annual capital expenditure program and sets priorities based on compliance with *licence conditions* and emerging thermal and voltage network constraints.

Subtransmission powerline works often involve long lead times due to environmental and community concerns, and delays in procuring easements. Country Energy expects to commence a large number of these projects during 2007-08 and 2008-09. This work will be of a low cost nature involving powerline route identification, environmental assessments and community consultation. Many of the easements will be procured during this period. The preparatory work will enable construction works to commence from around 2009-10 onwards. It is important to note that the timing of projects may change due to changing priorities or circumstances.

The cost of subtransmission network augmentation and reinforcement is generally based on recent actual projects.

- *Distribution network asset classes*

  For this network class there will be a large number of small projects, meaning individual identification and assessment is not achievable. Some larger projects will be known and these are assessed for reasonableness on an individual project basis.

  Accordingly, for this category, Country Energy has developed a generic growth related capital expenditure assessment approach for estimating the relationship between expenditure and growth. The expenditure forecast is determined from growth in new customer connections and expected average incremental connection costs for specific types of connections, net of capital contributions, and then compared to historical expenditures.

  The assessment model allows sensitivity testing for modified growth scenarios. For a given rate of growth, the model estimates the likely aggregate level of capital expenditure that will be required for the distribution asset class in order for the network to cope with the increased load.

  We believe this historical replacement cost analysis of investment related to growth provides good guidance for the continued investment at the distribution network level. The majority of expenditure for the distribution network class occurs for high and low voltage overhead powerlines and distribution substation asset class.

- *Customer metering and load control equipment*

  The forecast of capital expenditure for new customer metering and load control receivers is based on the number of new customers estimated to connect to the network in each year. Costs have been estimated using historical costs for various classes of customer metering and load control. No allowance has been included for the cost of installing new customer metering for contestable customers.

  For frequency injection plant and associated equipment, the capital expenditure forecast has been based on current policies, standards and requirements, coupled with specific programs of work to be completed over the period to 2013-14.

- *SCADA, Distribution System Automation (DSA), and Communications*

  The capital expenditure forecast has been based on current policies, standards and requirements, coupled with specific programs of work to be completed over the period to 2013-14.

The main drivers of growth related capital expenditure for Country Energy are discussed below.

5.7.2 *Rate and location of growth in peak demand*

The peak demand placed upon an electricity network is influenced by many factors, such as economic activity, customer activity, the type of customer installations connected to the network, and the extremes of weather conditions. The growth rate of peak demand (and customer connections) drives much of the need for growth related investment in the network.

Figures 5.2(a) and 5.2(b) show the historical summer and winter system peak demand from 2002-03 and the 50th percentile peak demand forecasts for summer and winter for Country Energy's network operating area as a whole, under three economic growth scenarios.

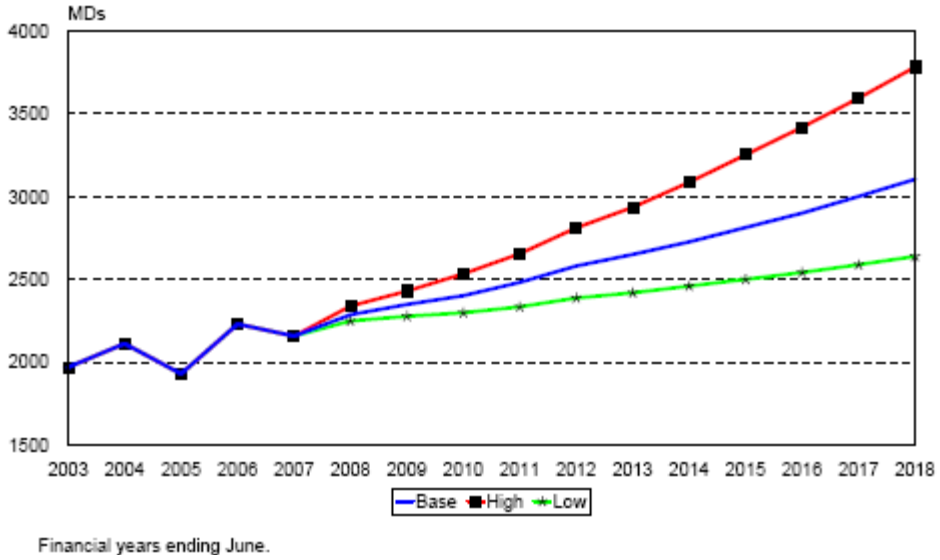

Figure 5.2(a): Historical and forecast system summer peak demand (50th percentile)

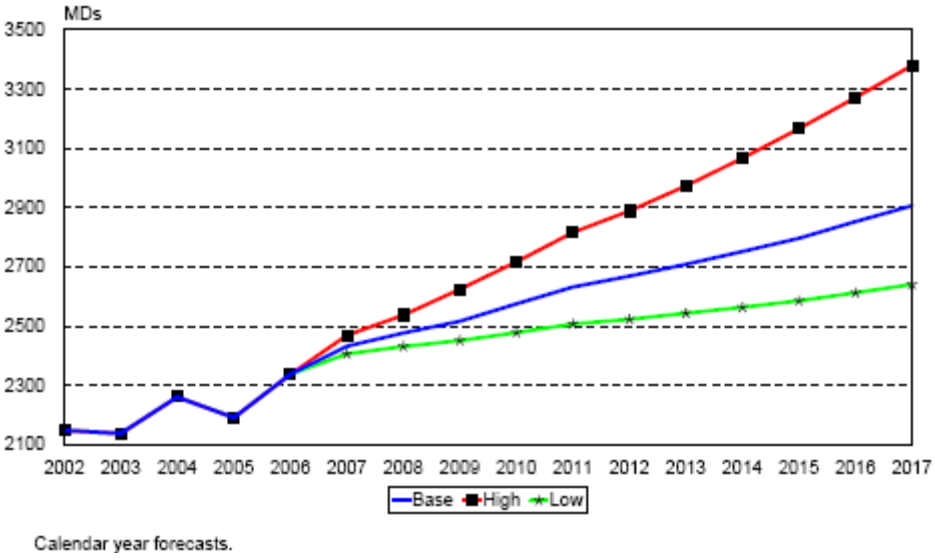

Figure 5.2(b): Historical and forecast system winter peak demand (50th percentile)

The average annual rate of growth in summer and winter peak demand for the whole of the network is expected to be 3.0 per cent and 1.8 per cent per annum respectively under the base growth scenario over the period to 2013-14. Over a 10 year period to 2017-18, the corresponding growth rates for summer and winter peak demand is expected to be 3.4 per cent and 2.0 per cent per annum respectively.

While the summer peak demand may be growing at the average 3.0 per cent per annum coincident at a system wide level, the actual growth at the zone substation, local or regional area peak demand are, in many instances, much higher than this. It is these local forecasts of loading and network utilisation that tend to drive the specific need for capital expenditure rather than the coincident system peak demand.

Country Energy's growth related expenditure is generally targeted at reinforcing the network in the strong economic growth corridors, high density industrial areas, and where step load connections occur.

The high growth areas include the north eastern area of NSW (including the mid north and far north coastal regions), south eastern coastal region, and some major regional centres. They represent some of the fastest growing areas of the state in terms of residential and commercial development, and expansion is forecast to continue. For example, the average annual rate of growth in summer peak demand for the north eastern region is expected to be 4.2 per cent per annum over the period to 2013-14 and around 4.4 per cent per annum over a 10 year period to 2017-18.

Despite the high growth trends in certain areas, many inland rural towns and areas are experiencing very low or negative population growth, although this does not necessarily translate into falling electricity demand forecasts as illustrated by the forecasts for Broken Hill. Winter loading peaks normally occur in the inland areas of the network. The major growth drivers in these areas reflect some industrial growth in the mining, primary production, irrigation and food processing industries. Spot developments can provide the greatest variability in terms of expenditure forecasting and in network planning. The primary capital expenditure driver for this region of our network is the renewal of ageing assets.

The figure below illustrates the higher growth corridors in Country Energy's operating area, including the forecast peak demand growth in these corridors over the period to 2013-14. Most other inland areas are growing at a rate of between 0.5 and 2.5 per cent.

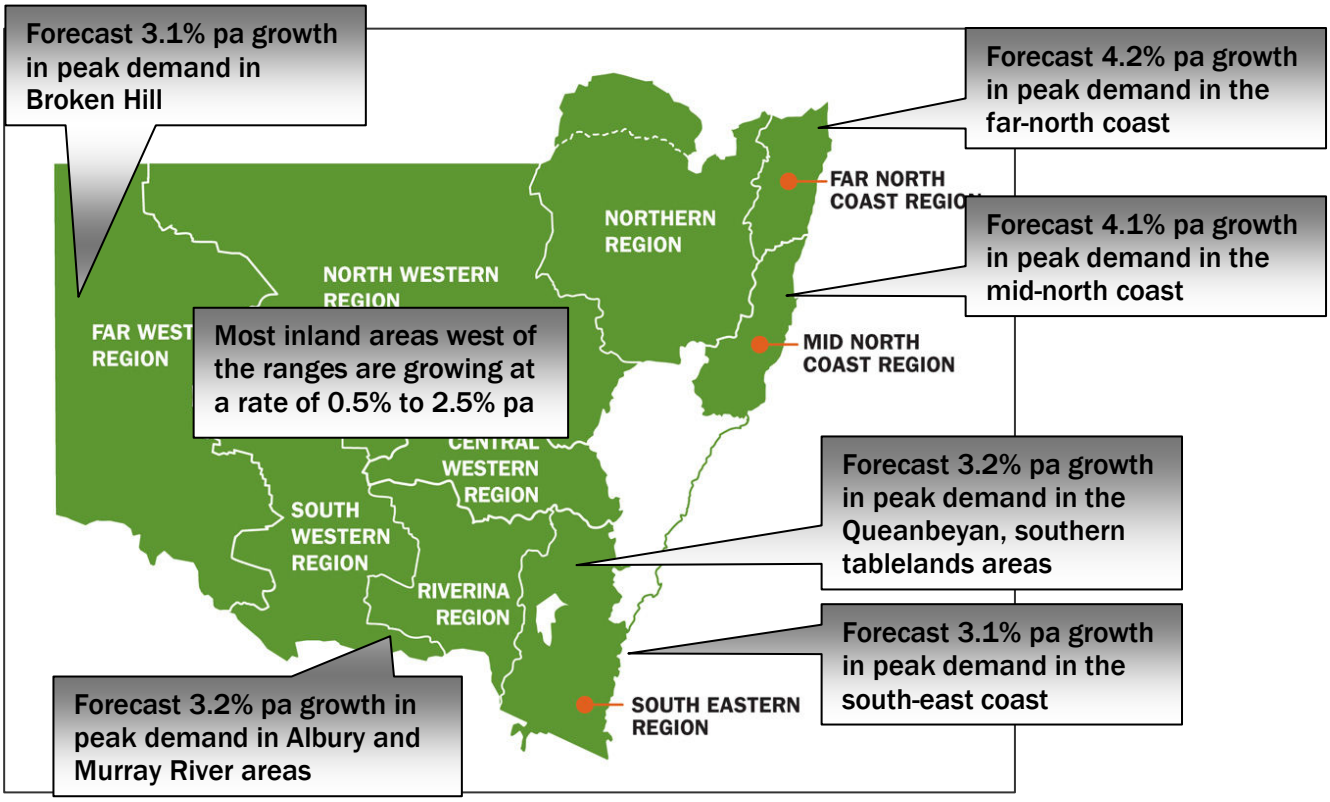

Figure 5.3: High growth corridors in Country Energy's network to 2013-14

The main factors driving the high growth in peak demand in this part of the network, and the increasing need for growth related capital expenditure requirements, include:

- Strong population growth, economic growth and increased residential building activity, and
- Increases in peak demand arising from new customer connections and increasing consumption by existing customers – including increased penetration of domestic air conditioners and other energy intensive electrical appliances in new and existing homes due to their increasing affordability, causing an increase in average consumption and demand by customers, especially during the summer period.

These sources of growth are discussed in more detail below:

- *Rate of customer connection growth*

  Customer connections represent new physical connections to the network. The total network customer numbers are expected to increase at an average rate of around 1.5 per cent per annum to 2017-18, under the base growth scenario, generally in line with customer number growth in recent years.

  Growth in residential customers is driven by the strong development of dwellings and population growth in the coastal areas of the network, reflecting the national demographic trend to seaside residential development. Areas in and around the major regional centres have also been growing at a higher rate than the average across Country Energy. Growth in business customers generally reflects economic activity.

  Customer driven connection assets are required to be constructed for each new customer connected to the network. This work is partly funded by Country Energy and partly by the new connecting customer or developer.

  A new customer connection and residential/commercial developments will generally result in immediate investment of capital required for distribution network extensions, for the high voltage and low voltage distribution asset categories. For larger commercial/business customers, this will often also include the installation of a new distribution substation.

  Each load connection also has a flow on incremental impact on upstream augmentation needs including upgrades and new asset construction. Consistent with Country Energy's capital contribution policy, the construction of 'shared' assets in an urban area is funded by Country Energy.

- *Penetration of air conditioning system*

  Summer load demands have a high correlation with ambient temperature due to air conditioning loads. Winter load demands are relatively less temperature sensitive due to the penetration of gas hot water and heating in many parts of the network.

  Country Energy's current total temperature sensitive load represents some 41 per cent of the total peak summer demand. This extreme peak loading occurs for less than 1 per cent per year. A recent NIEIR report forecast that by 2013-14, the total temperature sensitive load is expected to represent some 51 per cent of the total peak summer demand, and in 2017-18, it is expected to increase to over 55 per cent.

  Data from NIEIR also shows that the average change in maximum daily load, per degree change in average daily temperature for summer, has increased from 23 MW to 56 MW over the period from 2000-01 to 2006-07, across the entire Country Energy network. This is a clear indication that the peak demand is becoming more heat and weather sensitive reflected by higher air conditioning penetration. NIEIR's data also shows that the historic annual increases in temperature sensitive demand in Country Energy's region is around 30 per cent above the levels occurring in the early part of this decade. This trend is mirrored across NSW and most other states.

Air conditioning penetration in the Country Energy region is being bolstered by:

- high penetration rates into new dwellings and new commercial buildings
- upsizing of air conditioning unit sizes as older units are being replaced or added to, and
- most importantly, a high penetration into established dwellings and commercial buildings.

This trend has shown no significant easing or signs of saturation.

Figure 5.4 illustrates the impact of temperature on the peak demand placed on the Country Energy network. Specifically, it shows the difference between the demand curve on a mild 25ºC summer day (blue) and the demand curve for an extreme 40ºC summer day (red) at the Lismore bulk supply point (located in far north coast region). It clearly demonstrates the impact of air conditioning on the load curve.

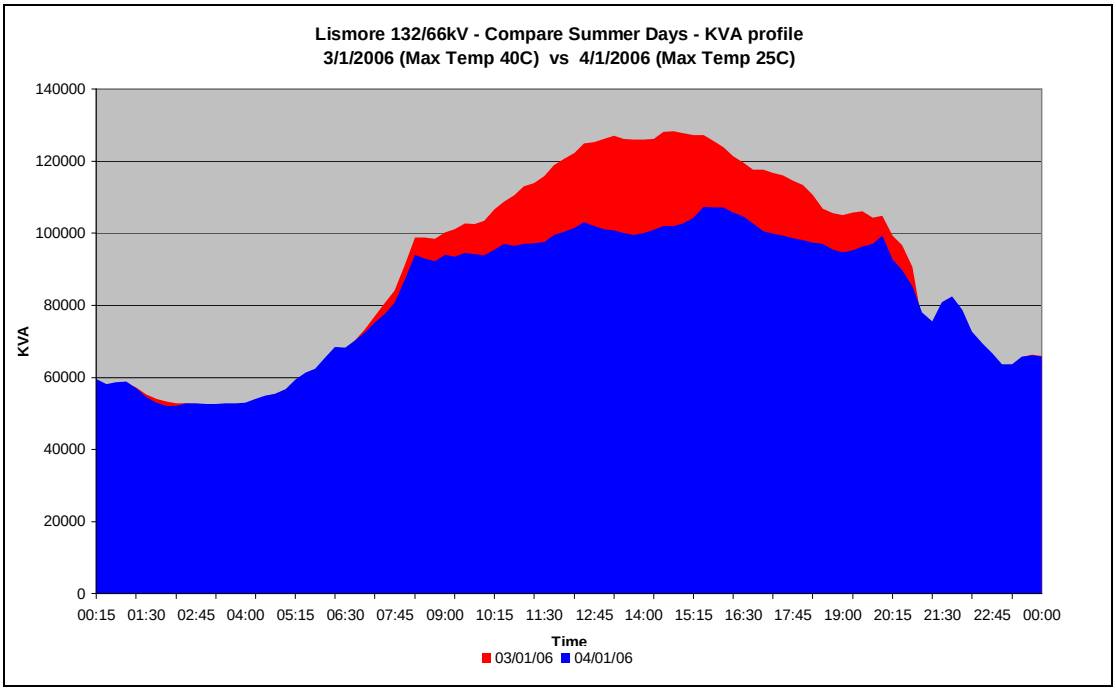

Figure 5.4: Impact on network demand of a mild and hot summer day

The installation of air conditioning can also drive the need to upgrade low voltage mains and customer service connections, due to power quality issues (see Section 5.10.2 for details of the power quality improvement program).

- *Shift to a summer peak demand*

  In some parts of the network there has also been a gradual shift from a short and sharp evening winter peak to an afternoon summer peak driven by high ambient temperatures during the day with a substantially different (flatter) load curve. It is expected that the summer peaks will begin to prevail from around the summer of 2012-13 onwards on a base economic growth scenario.

  It is the high rates of air conditioning penetration that have led to unexpectedly high summer demand peaks in some parts of the network. The occurrence of an afternoon peak during the hottest part of summer is more onerous on the distribution network than the evening winter peaks, as system ratings of electrical equipment are reduced at higher ambient temperatures when peak loading often occurs.

For example, on average the summer 'name plate' capacity of power transformers is around 10 per cent lower than winter capacity. This is because of hotter temperatures, and the fact that the summer peak typically lasts 3 to 4 hours longer than the winter peak. There are some 47.4 per cent of Country Energy's zone substations that are currently summer peaking, compared to 34.3 per cent in 2000-01.

All of this can result in severe stress on electrical infrastructure causing augmentation and reinforcement to be implemented earlier to maintain acceptable risk. It is a key driver and consideration when evaluating growth related capital expenditure.

- *Application of Design Planning Criteria*

  The *licence conditions* set out the design planning criteria to be used by Country Energy in planning, developing, managing and operating its electricity network to ensure that it provides an adequate supply with an appropriate level of security. In particular, the design planning criteria set out:

  - Input standards to be used by Country Energy in planning its network, and
  - Requirements for load forecasting and contingency planning methodologies intended to achieve operational outcomes.

  More specifically, the *licence conditions* require Country Energy to maintain an N-1 security level at subtransmission substations, major zone substations and subtransmission feeders that supply a load in excess of 15 MVA, and for high voltage distribution feeders in regional centres, such that supply is maintained in the event of the single failure of a major component of the network.

  The design planning criteria for the subtransmission network and zone substations applicable to Country Energy is tabled below:

Network Element	Load Type	Forecast Demand or Expected Demand	Security Standard	Customer Interruption Time
Subtransmission Line	Urban & Non Urban	≥ 15 MVA	N-1[1]	< 1 minute
	Non Urban	< 15 MVA	N[2]	Best practice repair time
Subtransmission Substation	Urban & Non Urban	Any	N-1	< 1 minute
Zone Substation	Urban & Non Urban	≥ 15 MVA	N-1[1]	< 1 minute
	Non Urban	< 15 MVA	N[2]	Best practice repair time

Notes:

1 For an overhead subtransmission line and a zone substation:

a under N-1 conditions, the forecast demand is not to exceed the thermal capacity for more than 1% of the time i.e. a total aggregate time of 88 hours per annum, up to a maximum of 20% above the thermal capacity under N-1 conditions.

For Country Energy, in other than regional centres, the forecast demand must not exceed the thermal capacity under N-1 conditions.

b under N conditions, a further criterion is that the thermal capacity is required to meet at least 115% of forecast demand.

For an underground subtransmission line, any overhead section may be designed as if it was an overhead subtransmission line, providing the forecast demand does not exceed the thermal capacity of the underground section at any time under N-1 conditions.

2 Under N conditions, thermal capacity is to be provided for greater than 115% of forecast demand

Table 5.7: Subtransmission design planning criteria for Country Energy

The *licence conditions* require Country Energy to be compliant 'as reasonably practicable' with the applicable design planning criteria for all network elements by 1 July 2014. Full compliance for all network elements is required by 1 July 2019.

Implementation of the security of supply requirements of the revised *licence conditions* necessitated a detailed review of planning targets, specific projects to be developed, and the capital expenditure requirements for compliance to be achieved by June 2014.

System adequacy under normal network configuration - Country Energy's network in normal configuration must be able to meet peak energy demands and remain within permissible component current ratings and voltage limits. Where loading on components has reached or will reach the maximum capacity available and does not accord with Country Energy's planning criteria, network augmentation or new assets will be built.

While these constraints are distributed through all Country Energy regions, the northern coastal region currently has the largest proportion of subtransmission feeders, zone substations and high voltage distribution feeders exceeding planning criteria.

Security of supply under abnormal network configuration - The level and timing of growth related expenditure is also influenced by security of supply considerations at both the subtransmission and distribution voltage levels under abnormal network operating conditions. Where loading on components has reached or will reach levels that do not accord with Country Energy's N-1 planning criteria, network augmentation or new assets will be built.

Emerging voltage and thermal constraints - Subtransmission and distribution feeders are deemed to be voltage constrained when the voltage regulation criterion is exceeded during the peak demand period. Thermal capacity constraints can often coincide with voltage constraints on some feeders.

Voltage regulation is a critical component in the growth related program at a distribution level. Due to the distances to some load centres and the original choice of lower voltages, such as 11 kV and 12.7 kV SWER in some areas, voltage regulation will continue to be a major driver for replacement.

- *Increasing asset utilisation*

  Another major driver of growth related capital expenditure is the potential for increased demand to extend the utilisation of the network beyond acceptable limits which may result in reduced security (and reliability) of supply. Higher utilisation of the network means reduced capability for the network to cope with extreme weather conditions.

  Electricity supply networks are normally designed and built with spare capacity sufficient to accommodate several years of load growth without the need for continual upgrading works. However, a sustained period of high growth rates without appropriate capital investment may increase utilisation beyond a prudent level and adversely affect the quality and security of supply to customers as the available capacity becomes compromised. Additionally, assets age more quickly with higher utilisation. Ultimately this will impact on reliability over time unless addressed through augmentation works.

  Country Energy has already achieved a high level of asset utilisation across its network. Figure 5.5 shows the spread of zone substation utilisation levels as a percentage of the substations' firm capacity (excluding single transformer sites) calculated in 2000-01 (blue) and 2005-06 (red). The average utilisation has increased from 84.1 per cent to 88.0 per cent and in the absence of investment will increase even further to 2013-14.

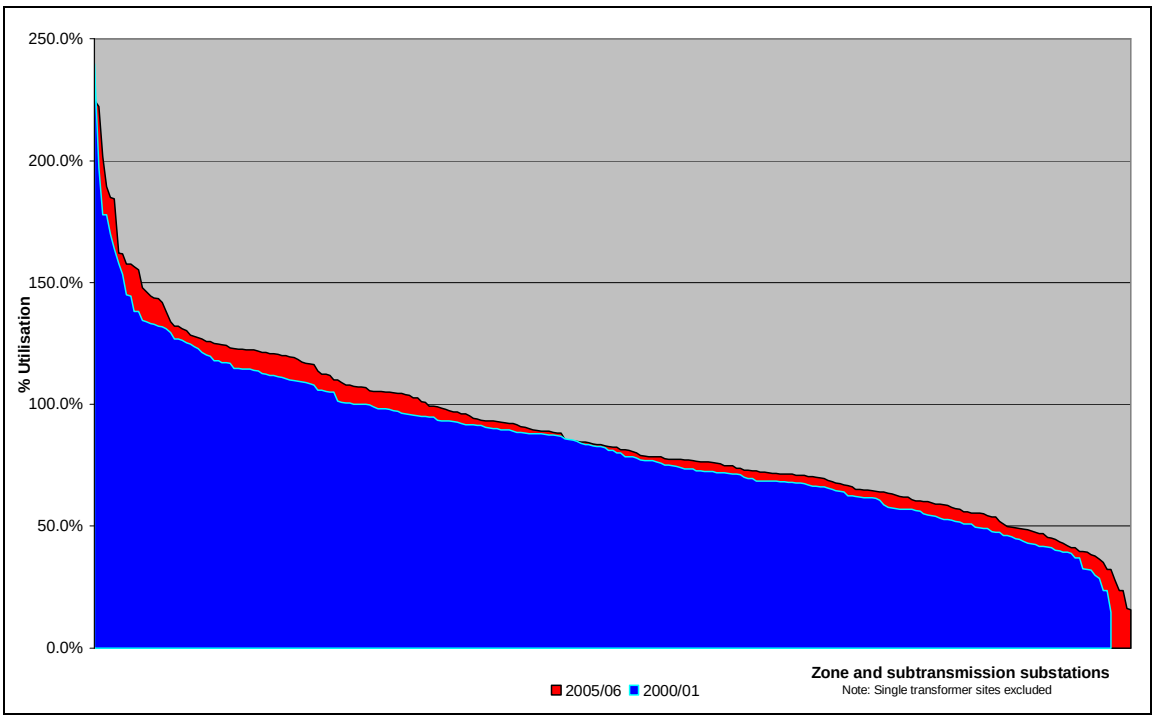

Figure 5.5: Average utilisation using substation firm capacity

The current utilisation as a percentage of the substations' total installed capacity and as a percentage of the substations' firm capacity in the north eastern network is 47.3 per cent and 98.3 per cent respectively. This compares to 46.1 per cent and 93.8 per cent respectively in 2000-01. Any further increase in asset utilisation at the subtransmission and zone substation levels would not be consistent with the requirements set out in the *licence conditions*. Implementation of the design planning criteria in the *licence conditions* will reduce the utilisation of zone substation transformers.

Over the period to 2013-14, Country Energy intends focusing on the delivery of the *licence condition* related augmentation programs with particular focus on the north eastern region, in consideration of factors such as:

- network type
- load profiles
- application of short time ratings of plant
- probability of plant failure at time of peak demand
- demand management initiatives, and
- construction of new facilities to transfer load.

Country Energy has achieved a network load factor of around 60 per cent across the network, arising from a relatively flatter load curve. While energy consumption is forecast to increase at around 1.5 per cent per annum, it is expected to do so at a lower rate than the expected increase in summer peak demand of 3.4 per cent over a 10 year period, due mainly to the increase in air conditioning load. This is expected to result in a lower load factor, which again is an important consideration as summer peak demand growth becomes the key driver of expenditure.

- *Deferral of capital from demand management*

  Demand management through system wide load control has already deferred significant capital expenditure. Future benefits are likely to be available on an incremental basis only through improved load analysis, more targeted load switching, and deployment of distributed generation to reduce demand. This area is likely to be the main driver of deferred capital expenditure moving forward.

There has been an increase in applications received from potential demand management participants and from embedded generators, particularly including wind energy generators. The decision to apply demand management or to augment the network always remains an issue of technical feasibility, timing, service preferences, economic efficiency, application of sound industry commercial practice,. To date few demand management proposals have resulted in technically and commercially feasible demand side management solutions. Country Energy actively seeks out and works with third parties to develop demand management solutions to defer network expansion. The *NAMP* includes Country Energy's Demand Management Strategic Plan, which details Country Energy's approach to demand management.

The total forecast for growth related expenditure (excluding capital contributions) assuming a base growth scenario is estimated to average over $286 million per annum in the *next regulatory control period*. Forecast expenditure increases from $249 million in 2009-10 to $314 million in 2013-14.

Country Energy believes that the growth related capital expenditure forecasts in this *regulatory proposal* represent the minimum level of capital expenditure that can practically be completed, given projections of growth. Further details of Country Energy's forecast of growth related capital expenditure is set out in the ESDR, which identifies the specific and generic network projects that are required to meet increased demand and customer growth over the next five years (refer to Appendix J).

5.7.3 Growth related programs

Growth gradually consumes available capacity and can erode security of supply. Over the *next regulatory control period* the network will need to be expanded, augmented and reinforced. The major elements of the network augmentation and reinforcement programs are outlined below.

- *Subtransmission network*

  The capital expenditure program includes:

  - Construction of new subtransmission powerlines
  - Capacity increases for existing subtransmission powerlines by reconstruction, thermal upgrades to enable powerlines to operate at higher temperatures, or reconductoring
  - Providing an alternative supply or loop network at the subtransmission level, and
  - Acquiring powerline routes and easements for future projects.

  Subtransmission network augmentation and reinforcement is demand driven, and results from the requirement to meet the general load growth of both new and existing customers, and the *licence conditions* relating to loads in excess of 15 MVA.

  There is a requirement for the construction some 600 kilometres of new subtransmission lines supplying substation loads greater than 15 MVA which do not currently provide N-1 security over the planning period to 2013-14. There is a requirement to augment approximately 1,000 kilometres of subtransmission powerline where the peak demand has exceeded thermal ratings or voltage limitations or there are emerging constraints. There is also the need to construct some 400 kilometres of subtransmission powerline to connect new assets.

  The individual subtransmission powerline projects that will be undertaken by Country Energy over planning period to 2013-14 are referred to in the *NAMP*.

- *Zone and subtransmission substations*

  The capital expenditure program includes:

  - Construction of new zone and subtransmission substations
  - Installation of additional transformers or the capacity upgrade of existing power transformers
  - Upgrading of switchgear and protection equipment in existing zone substations
  - Installation of bus section tie circuit breakers and associated protection systems
  - Upgrading of overhead and underground cable substation exits
  - Installation of capacitor banks
  - Land purchases for future substation sites, and
  - Upgrading of rural zone substations to urban designs to improve security of supply.

  The drivers for expenditure are similar to those drivers for the subtransmission network.

  To meet expected load growth or when load cannot be supplied from existing distribution facilities and all alternative augmentations such as new distribution feeders, additional transformers and demand management have been exhausted, new zone substations are constructed.

  Plans for zone and subtransmission substations are developed and updated annually to ensure they are capable of meeting a 50 per cent PoE forecast. The ESDR provides further information.

  To cater for load growth over the planning period to 2013-14, up to 26 new or augmentation zone and subtransmission substation projects are planned over the planning period to 2013-14 in order to provide an N-1 level of security for loads greater than 15 MVA, or where the peak demand has exceeded the firm capacity of the installed transformers.

  The individual zone and subtransmission substation projects that will be undertaken by Country Energy over planning period to 2013-14 are referenced to in the *NAMP*.

- *Distribution network*

  The capital expenditure program includes:

  - Construction of new urban distribution feeders connected to new and existing zone substations
  - Construction of new interconnections between adjacent urban feeders to create a meshed network to address identified shortfalls in transfer capabilities
  - Capacity uprating of existing urban feeders through reconductoring to provide sufficient transfer capability for interconnection to existing radial urban feeders
  - Extension of existing rural distribution feeders
  - Uprating of rural feeders with voltage or thermal capacity constraint problems by reconductoring, thermal uprating, re-tensioning, installing regulators, or voltage conversion
  - Provision of new and upgraded distribution substations and transformers, and
  - Provision of new and augmented low voltage circuits.

  This program is mainly aimed at reducing the level of network constraints and overloads across parts of the high and low voltage distribution network. Where a distribution feeder peak loading exceeds 80 per cent utilisation, or feeders would be loaded above their emergency rating, augmentation works will be carried out.

In the growth areas of the northern and southern coastal corridors and the larger regional centres, significant augmentation and reconfiguration of the distribution network will be required. Country Energy predicts that the thermal rating of a number of existing distribution feeders in these areas will exceed their design capability over the *next regulatory control period*, and new feeders will also be required. To date, a large proportion of demand growth has not necessitated significant augmentation and reinforcement of the existing network. However, as the utilisation of existing assets is approaching accepted maximum levels, this will result in the requirement to meet continued demand growth through the construction of new network assets.

The network capacity increase is the minimum level required in order to maintain required security of supply and load at risk. In urban areas it is usually economic to provide alternative supply by building feeder transfer capacity and interconnections.

The types of powerline conductors used in rural areas include a mixture of steel, aluminium steel reinforced conductor, and copper conductors. Steel conductor has very high impedance and, when subjected to loading levels beyond its limited rating, voltage constraints occur. In some rural areas, the 11 kV network has reached capacity and it is not viable to increase the number of zone substations or size of feeders to supply any increased demand. Country Energy has a long term plan in place to replace the 11 kV network with 22 kV in some remote areas of the network.

Voltage regulators are installed on long rural powerlines to manage voltage levels. Country Energy plans to continue to install additional regulators where voltage degradation has occurred.

Country Energy usually bears the cost of works associated with the replacement or capacity upgrading of distribution transformers and low voltage due to increased demand. Overloaded transformers are upgraded in a timely manner to ensure that voltage quality does not deteriorate with the increase in demand.

- *Customer metering*

  The capital expenditure program includes provision for the installation of new single phase and multi phase meters, including CT connected meters, for new residential, commercial and industrial developments and connections.

  The drivers for expenditure are similar to those detailed for the distribution network.

- *Load control equipment*

  The capital expenditure program for load control equipment includes:

  - Provision for the installation of new load control receivers for new residential and commercial/industrial developments and connections, and
  - Installation of new frequency injection plant and load control receivers due to network augmentation programs carried out within the local subtransmission network, creating conditions whereby the existing frequency injection facilities are made redundant, or creating signal 'holes' where existing plant is not suitable to the changes in system configurations.

  The installation of modem load management systems provides greater flexibility in the management and control of peak demand load, as compared to traditional time switches and older type motor generator transmitters. Country Energy will continue to instigate programs of work to deliver frequency injection control into areas where no such facility currently exists. Works will also progress in reinstating load control facilities in areas where such facilities are not operating effectively, to achieve better demand management.

- *SCADA, Distribution System Automation, and related Communication Equipment*

  SCADA systems, DSA systems and the related communications network are key components in maintaining the reliability of the network.

  The capital expenditure program for SCADA, DSA and related communication equipment includes:

  - Rollout of SCADA facilities to new zone and subtransmission substation sites
  - Rollout of SCADA facilities to existing zone and subtransmission substation sites with no SCADA facilities
  - Rollout of SCADA to sites due to accessibility and/or remoteness of equipment
  - Gradual implementation of DSA to new sites for the automated, remote monitoring and control of distribution devices
  - Rollout of optic fibre in conjunction with the construction of subtransmission powerlines, and
  - Continued development of communication infrastructure for SCADA and DSA.

  The most important function of the SCADA system is to provide 24 hour monitoring and control of zone and subtransmission substation assets. Typically, the substation SCADA system is programmed to handle a number of different functions. Every effort is made to facilitate these features, if not at commissioning, but as part of future planned replacements and upgrades for the substation site. It is the ultimate aim to install 'state of the art' SCADA systems in every zone substation.

  Generally DSA comprises automated devices located outside the zone substation on the distribution network, including but not limited to automated reclosers, motorised high voltage air break switches, sentry indicators, powerline fault indicators, and high voltage gas switches.

  The area undergoing the greatest development in communication systems is the southern region of Country Energy, where the absence of suitable communications infrastructure has been a serious hindrance to creating a suitable, integrated SCADA platform in the past.

5.8 Forecast capital expenditure – asset renewal

The renewal of system assets is a major component of Country Energy's overall capital expenditure program. Network assets have a finite life and, in order to maintain or improve the level of service provided by the network, system assets must be replaced. Capital expenditure is required to ensure the timely renewal of in service system assets that are aged, unserviceable, frequently fail in service, deteriorated to an unsafe or risky condition, or where the present value cost of maintaining the asset exceeds the cost of replacement. This aspect of asset management is particularly important, given the size and in service age of system assets owned and operated by Country Energy is steadily increasing.

The asset renewal expenditure program compromises two main types of expenditure - asset refurbishment and asset replacement. Asset replacement involves the replacement of the whole of the asset with the modern equivalent asset, using current designs and construction techniques. Asset refurbishment involves overhauling and/or renewing constituent components of the asset and is intended to restore the service life of the whole of the asset largely to an 'as new' condition. Through a process of continual refurbishment, the life of the asset is extended.

In each case, the need for asset renewal is largely brought about by the physical condition and age of the in service asset and/or component item.

The other main drivers that influence the renewal and replacement of assets for Country Energy includes but are not limited to:

- Excessive defects
- Type faults
- Safety risk to public and employees, including operational restrictions
- Reliability, security and quality of supply standards and *licence conditions*
- Industry accepted technical standards and codes
- Past standard and regularity of inspection, maintenance and repairs carried out
- Construction deficiencies, robustness of the original asset design and materials and methods used
- Load growth and demographic changes
- Uprating due to voltage regulation, thermal constraints, or fault duty
- Compliance with reliability, security, and quality of supply standards and *licence conditions*
- Industry accepted technical standards and codes
- Mechanical and/or electrical stresses imposed on equipment
- Environmental factors
- Climatic service conditions
- Obsolescence or technological improvements, and
- Availability of spares.

These drivers demonstrate that age is not the only criterion for the final decision to replace or refurbish an individual or group of system assets.

In addition, the renewal program is driven by environmental, safety, infrastructure security, and legal compliance considerations detailed in Section 5.9. Distribution related reliability and quality of supply related capital expenditure to maintain, or improve, network performance to comply with *licence condition* requirements, also places emphasis on maintaining the network in good condition. It is also related to this category as detailed in Section 5.10.

The consequences of not programming the progressive replacement and/or refurbishment of deteriorated/aged assets include:

- Risk of injury to employees and the public
- Replacement requirements accumulating to levels which become unmanageable
- Increasing maintenance costs
- Failure of assets in service
- Poor network performance, and
- Lower reliability resulting in supply interruptions.

Network failure rates increase with increasing asset age and reduce with increasing levels of asset renewal.

Asset replacement expenditure increases over time, particularly once larger areas of the network reach a certain stage in their lifecycle. In the areas of the network, west of the ranges for example, the Country Energy system assets are showing signs of ageing and are increasingly requiring renewal and replacement. This ageing trend is demonstrated by the higher levels of expenditure in the *current regulatory control period*, as detailed in Section 5.3. This is expected to continue into the *next regulatory control period.*

The resulting forecasts for the planning period to 2013-14 are provided below.

Asset renewal ($M 2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Sub-transmission lines and cables	16	17	18	19	20
Distribution lines and cables	63	71	76	80	84
Substations	23	26	28	30	31
Transformers	18	20	21	23	24
Low Voltage Lines and Cables	4	5	5	5	5
Customer Metering and Load Control	11	12	13	13	14
Communications	4	4	4	4	4
- Land	-	-	-	-	-
- Easements	-	-	-	-	-
Total - system capital expenditure	**138**	**155**	**165**	**173**	**183**

Table 5.8: Forecast of asset renewal expenditure for 2009-10 to 2013-14

Country Energy forecasts that the total asset renewal requirements will average around $163 million per annum for the planning period to 2013-14.

5.8.1 Asset renewal forecasting methodology

The methodology employed to forecast 'core' asset renewal expenditure uses a combination of factors to smooth out the resource requirements over the *next regulatory control period* such that service standards, related maintenance costs, and the weighted average age of assets remain relatively constant and stable over the same period.

The forecast of asset renewal expenditure requirements is founded on the analysis and consideration of the following key components:

- Condition based assessment, particularly for power transformers and zone and subtransmission equipment
- Implementation of specific asset renewal programs and initiatives
- Assets reaching the end of their lives based on an examination of age based replacement profile information
- Risk to the safe operation and network performance of asset classes, and
- Historical expenditures.

The consideration of age based replacement profile does not imply that Country Energy's replacement policy is based on age, but rather, it reflects the asset life expectation in a statistical sense where the asset or group of assets will be replaced depending on a number of issues such as condition, technological obsolescence, environmental, failure or some other technical driver. Evidence for renewal is better obtained through asset inspections and/or condition monitoring and measurements, and the need for the implementation of specific asset renewal initiatives.

However estimates of future capital expenditure using an age based replacement approach is still a useful tool and can provide an overall guide for medium to long term asset planning and forecasting purposes.

The quantities for each asset class that are categorised to be replaced are multiplied by their respective efficient unit replacement costs. The asset replacement costs reflect Country Energy's unit cost of replacing each of the asset categories. This methodology is in accordance with sound network planning practices.

- *Accounting for asset condition*

  The condition of assets is captured in the forecasting process as it greatly affects the need for future investment in asset renewals. Country Energy implements diagnostic and condition monitoring practices to determine which power transformers and zone substation assets are to be renewed and/or maintained according to their actual condition.

  This process also involves analysis of the respective age profiles of each asset class or individual plant items, according to an engineering assessment of the condition and age of each asset item of plant. Where an individual asset is due for renewal based on age alone but is still in good condition, it will be left in service and monitored, leading to an associated expenditure 'deferment'. Similarly, if the individual asset or asset class is in poor condition, it will be renewed irrespective of its age and budgeted for earlier replacement if it has not reached its nominal engineering life.

- *Accounting for risk for different asset classes*

  Country Energy has adopted different risk policies for different asset classes in the forecasting process, as they can affect investment in asset replacement. Asset replacement would generally be forecast to occur earlier for high value assets with a higher risk profile. Similarly, the application of risk management permits the utilisation of some assets beyond their expected life in those circumstances where our duty of care is not compromised. Use of a risk management approach for these non critical installations allows the deferral of expenditure.

  To minimise potential risk, Country Energy's general intention is to maintain a weighted average age across all system assets at the current level of about 27 years over the planning period to 2013-14.

  This process has the effect of spreading capital expenditure for the different asset classes over a number of years and reduces future expenditure volatility.

- *Accounting for specific asset renewal initiatives and programs*

  Country Energy has commenced, or will commence several specific asset renewal initiatives that are expected to continue into the long term. The assets to be renewed, as a result of these specific initiatives, are identified and programs costed, and are removed from the asset replacement profile calculated using the age based methodology and added back into the profile in the year they are identified for replacement. This avoids double counting of renewal expenditure requirements.

- *Forecasts using an age based replacement methodology*

  Asset replacement modelling requires an understanding of when assets may potentially fail due to age or deterioration. A group of assets that are installed or constructed in a given year will not all fail (or be retired) at exactly the moment when they reach the end of the average working life for that particular class of asset. Failures of assets will occur both before and after the average service life. The occurrence around the average service life will generally follow some form of bell shaped curve where failures or retirements will start slowly, accelerate to an average age, and decelerate until they are all gone.

  Country Energy has developed an internal asset replacement forecasting model for predicting asset failures and age based asset replacement rates, for the purpose of supporting medium to long term planning of asset renewal expenditure requirements.

The age based failure replacement schedules are estimated using proven statistical methods, in this case the Weibull probability distribution function analysis, and are calculated using the combinatorial probability for the groups of assets within the asset class that are expected to fail. The model generates age based replacement schedules for each asset class and uses asset age profiles, nominal engineering lives derived from failure rates, asset quantities, and the unit replacement costs for each asset class. Country Energy obtained nominal engineering lives from sources of failure rate data, and available literature on nominal engineering lives and related international experience.

The age based replacement profile indicates the quantity or percentage of assets that is expected to be replaced by a given age or expected failure. The model also provides the failure and survival patterns for each asset class.

The predicted replacement profiles provide a very valuable tool for analysing asset renewal requirements that can support more accurate asset management plans based on asset condition, specific renewal programs and initiatives, compliance requirements, the potential long term impact of asset replacement rates on the age profiles of the asset population, and the potential risk for a sudden increase in future capital expenditure requirement because of age related failures.

The age based replacement model provides an annual replacement expenditure requirement that averages around 1 per cent of the total asset replacement cost per annum over the *regulatory period*. This amount is significantly below the 2 per cent long term average expenditure required to replace all assets over an implied weighted average asset life of 50 years.

Asset age profiles for different classes of assets provide useful information in relation to asset quantities and their respective year of installation and/or construction. This information can be used to make informed decisions on the long term strategies and programs for asset renewal. It also provides an input into predicting forthcoming asset renewal expenditures using age based forecasts.

The overall age profile, and the forecast replacement schedule from 2008 to 2035 using Country Energy's age based failure and replacement prediction model for all of Country Energy's system assets is shown in the figure below.

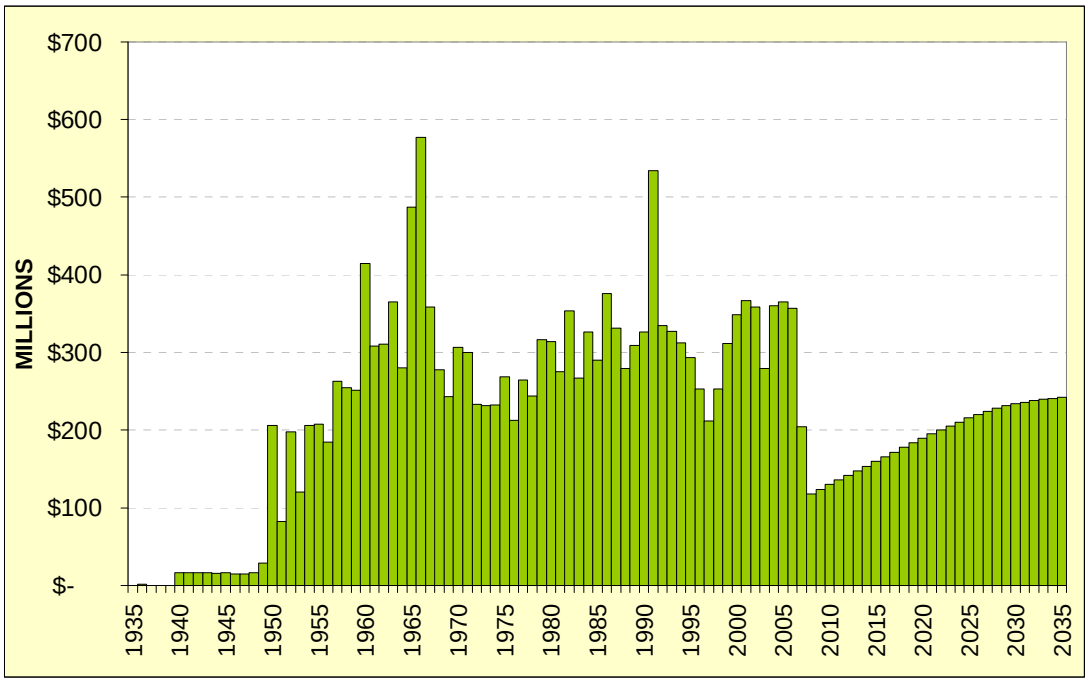

Figure 5.6: Overall age and replacement profile for all system assets

The general picture of Country Energy's asset base shows a varied age profile. The network was initially developed in the 1940s and a major period of investment can be traced back to the 1950s and 1960s, as a result of policies to invest in the creation and development of infrastructure in rural areas. It is clear that a large proportion of the assets installed over this period continues to remain in service, and represents a large proportion of the network and has aged.

The weighted average age across all asset classes is around 27 years. Around 33 per cent of Country Energy's existing asset base (by replacement cost) was installed during the 1950s and 1960s, and around 18 per cent (by replacement cost) was installed over 45 years ago. It is expected that on average 1 per cent of all assets will reach the end of their nominal engineering lives each year over the *next regulatory control period*.

Country Energy has entered a period in which the requirement for asset renewal expenditure will need to increase.

5.8.2 Overall asset renewal strategy

For long term planning and expenditure forecasting, it is important to establish overall strategies for the entire network and for each major category of asset. Country Energy's asset replacement and renewal expenditure forecast is derived from a comprehensive strategy contained in the *NAMP*. The *NAMP* details what is necessary to maintain the assets at the required level of service and in a safe condition, while optimising lifecycle costs for each category of asset. Strategies are set out for each major category of asset.

Country Energy's overall strategy for asset renewal involves:

- Ensuring that deteriorating assets are scheduled for renewal following routine inspection and/or condition assessment
- Balancing asset renewal and maintenance approaches to ensure that expenditures are optimised, and
- Spreading the demand for asset renewal over a manageable period to mitigate the financial impact on the business and prices for customers.

Country Energy does not universally implement programs for the targeted bulk replacement of system assets that have reached the end of their normal engineering lives. Rather our approach to identifying and prioritising renewal requirements, and the actual decision to renew all, or part, of an asset or group of assets is typically founded on a range of factors, including:

- Deterioration of condition identified during routine inspections and condition monitoring programs
- Historical failure statistics where available
- Assessed risk of failure
- Asset reliability and quality of supply performance and compliance
- Environmental, infrastructure security, or safety considerations
- Asset age relative to accepted nominal engineering lives
- Analysis of the commercial investment opportunity, and
- Implementation of specific initiatives as detailed below.

Country Energy's general intention is to ensure that in the medium term there is not significant over investment, such that the asset base becomes significantly younger, or there is not significant under investment, such that the average remaining life of assets becomes too low and reduces reliability. To achieve this outcome, the annual 'core' renewal expenditure is expected to average around 1 per cent of the total asset replacement cost per annum, across all asset classes to 2013-14.

Country Energy will continue to implement life extension programs, such as pole reinstatement and power transformer refurbishment, to extend the productive lives of assets beyond the nominal engineering life. However, based on current modelling as outlined below, it is expected that over the next 10 years a significant portion of Country Energy's system assets will need replacement due to condition and age related failure, or where they have become more difficult to maintain and life extension is not possible.

A responsible and focused approach to asset renewal is essential. We believe this overall strategy to be a realistic, practical approach to asset renewal management, and will ensure:

- Continuation of consistent, sensible asset renewal investment
- Assets are kept in good operating condition
- Reduced risk of asset failures
- Network performance levels are maintained, and
- Reduced volatility of future resource requirements.

Asset renewal also provides a stable platform for the implementation of additional work programs and initiatives to achieve improvements in reliability and quality of supply as required by the distribution *licence conditions*. We believe this strategy to be a realistic, practical approach to asset management and ensure the continuation of sensible asset renewal and replacement investment in the network.

Country Energy forecasts that asset replacement and renewal requirements will average $163 million per annum in the *next regulatory control period*. Expenditure increases from $138 million in 2009-10 to $183 million in 2013-14. This increase is consistent with the ageing population of assets. We believe the expenditure forecasts are conservative, given the increasing signs of deteriorating condition, failure and ageing, which is expected to continue into the planning period to 2013-14. The forecast expenditure represents a level of work that Country Energy has the resource capability to undertake.

5.8.3 Asset Renewal Programs and Initiatives

Country Energy will commence, or will continue to implement, several specific asset renewal initiatives in the period to 2013-14 and beyond. The specific programs relating to the major asset classes are summarised below. In the majority of cases, the decision to replace or refurbish is driven by condition data, age and failure related issues.

- *Zone and subtransmission substation power transformers*

  Country Energy's network includes has 690 power transformers of various ratings in service. Country Energy will continue to implement a replacement programs for zone substation power transformers, tap changers, circuit breakers, and switchboards due to condition, high risk of failure, lack of spares, and the high cost of maintenance based on condition assessment.

  Country Energy has, in recent years, embarked on a major condition monitoring program to assess the condition and remaining life of power transformers. This involves non-intrusive time based condition monitoring using diagnostic testing and other operations based service routines to assess the internal condition of plant. This process is preferred to disassembly and internal inspection. The results obtained from diagnostic testing are used to determine the performance of each equipment type.

  For power transformers the major diagnostic method used is the analysis of sampled oil. This is used to determine oil condition and establish a signature for the associated plant to allow determination of appropriate maintenance activities. Oil samples are referred to an appropriate National Association of Testing Authorities, Australia laboratory to determine oil quality and dissolved gases.

  Oil sampling intervals are DGA interval one year and oil quality interval four years or as per specific type requirements.

The criteria used for the assessment of the status of transformer oil condition are referenced in the *NAMP*.

Condition monitoring has detected that some of the older power transformers are now in need of replacement or refurbishment. In addition, the fact that a large number of power transformers in service have also reached the standard engineering life of 50 years immediately raises major questions as to the longevity of these ageing assets and the replacement and refurbishment strategies needed to ensure future reliable operation.

The remaining life of zone substation transformers is heavily dependent on the historical maintenance practices employed and the loading to which the transformer has been subjected. Generally, power transformers have been subject to utilisation levels with a relatively low ageing rate. However, some predecessor distributors adopted policies of running transformers at high loadings, whereas others employed a policy of lightly loaded, under utilised transformers.

Transformer failure mechanisms or component failures uneconomical to repair include:

- failure of bushings and tap changers that have reached the end of their mechanical design life
- insulation failure within the transformer winding, and
- mechanical failure of the winding due to the electromagnetic forces during faults.

Replacement expenditure on power transformers is based on a detailed asset management strategy, which involves condition monitoring, oil analysis and failure and age related issues. However, due to the high replacement capital costs of these units, major refurbishment can prove both cost effective and technically feasible in extending the life of these assets. The larger the unit the more economical it becomes to refurbish. Ongoing capital expenditure is budgeted for the refurbishment of such equipment.

On load tap changers are integral to most of Country Energy's power transformer population. There are some 635 tap changers in service. The various makes and types of tap changers have quite diverse maintenance requirements. There are presently 75 different types on the system that require specialised skills and certain older designs are becoming very maintenance intensive and costly to operate, with no suitable spares available.

Where tap changer replacement is uneconomic, due to the cost of purchasing and fitting of a replacement tap changer and the main transformer has little residual life as determined by insulation testing, the typical course of action is to replace the main transformer. Prioritisation will be typically in order of condition, network criticality, maintenance history, and associated transformer history and site remoteness.

Auxiliary transformers are replaced or refurbished as required on a case by case basis.

- *Zone substation equipment*

  Country Energy's network includes over 330 zone substations and switching stations within its network, which range from simple two feeder stations to complex 132-66-33 kV stations. Primary voltage ratings range from 132 kV to 33 kV.

  Each substation may comprise a range of plant and equipment including circuit breakers and switchgear, powerline bays, instrument transformers, capacitor banks, reactors, bushings, switchboards, control and protection schemes, relays, busbars, surge diverters, earthing systems, communication and SCADA systems, load control equipment, switchyard structures and hardware, batteries, overhead and underground cables, control and operational buildings, civil works, walls, fences and enclosures.

The remaining life of zone substation equipment is heavily dependent on the historical maintenance practices employed. Generally the switchgear has had good maintenance history, however spare parts are running out for some older units. The consequences of equipment failure can be quite substantial and may include not only the direct cost of repairs but also repairs to other equipment damaged as a consequence of failure.

Country Energy has an active asset management strategy in place involving inspection, condition monitoring, oil analysis, and testing programs to reduce the risk of failure of primary and secondary equipment and to extend the life of these assets.

The major diagnostic method used for instrument transformers is the analysis of sampled oil. DGA is generally carried out over an interval of 4 year or as per specific type requirements. Insulation quality testing is the key element in the safe operation of electrical plant such as power transformers, regulators, switchgear, and instrument transformers. The criteria used for the assessment of the status of high voltage switchgear insulation are referenced in the *NAMP*.

The maintenance strategies for the main groups of other plant include:

- Transformer tapchangers and auxiliary transformers - are subject to regular maintenance and operational checks.
- Circuit breakers and zone substation reclosers - activities include operational and diagnostic checks, as well as checks of the insulating medium
- Protection and voltage control schemes - activities include operational tests and calibration measurements to check that systems will function as intended when called upon to operate, and
- Other zone substation ancillary equipment - activities include routine inspection, maintenance and operational checks.

The frequency of inspection, condition monitoring and assessment are set out in the *NAMP*.

Country Energy has several zone substations with equipment programmed for replacement to 2013-14. The specific drivers for renewal of zone substation equipment include high maintenance requirement, poor reliability record, lack of spares, equipment age, operational safety, equipment condition, potential failures, mechanical fatigue, and increasing fault levels leading to switchgear replacement. Generally substation equipment typically requires complete replacement, rather than refurbishment. Specific components that present the greatest failure risks include:

- aged circuit breakers
- switchboards with oil filled equipment
- protection relays
- instrument transformers
- batteries
- surge diverters
- earthing systems, and
- substation perimeter fencing.

There have been a number of explosive failures of oil-filled circuit breakers within switchboards, highlighting the danger of any small oil volume oil filled equipment where internal failures result in the immediate rupture of the containment vessel. This presents a significant safety issue for employees and can render the switchboard inoperative.

Protection relays consist of a mix of electro mechanical, solid state and microprocessor based units that require replacement due to age and obsolescence, including:

- BBC L141A, a semi electromechanical/electronic type distance relay
- Reyrolle TS/C type, a predominantly electromechanical type distance relay
- Reyrolle H type, a predominantly electromechanical type distance relay, and
- GEC YTG type, a predominantly static type distance relay.

Current and voltage transformers identified for refurbishment or replacement are monitored and replaced in conjunction with adjacent primary plant. The replacement program will take place over a period of 10 years. Instrument transformer replacements are subject to prioritisation determined by DGA results.

There are over 400 substation batteries in service. Batteries are replaced when they have deteriorated to a predefined proportion of their design capacity. The typical life of the lead acid type is 15 years and for the nickel cadmium type is 20 years. It is planned to replace around 20 on average each year.

Silicon carbide gapped type arrestors are now experiencing failures due to gap erosion and failing seals that are allowing moisture ingress. The strategies in place to deal with this issue are:

- Closely monitor maintenance results of various types
- Replace all 132 kV silicon carbide surge diverters with new station class metal oxide units when adjacent primary plant is replaced, and
- Replace all silicon carbide surge diverters manufactured prior to 1965.

It is expected that some 580 substation surge diverters will be replaced on average each year.

Generally the switchgear has had good maintenance histories, however for some older units spare parts are becoming difficult to obtain.

Earthing systems at some substations have corroded, which has a significant safety implication.

Frequency injection plant is installed within the Country Energy's zone substations to manage load control activities through the switching of load control receivers. Load control transmitter plant consists of modern electronic static frequency injection plants through to older motor generator type units and cyclo control transmitters. Some of the installed systems are now suffering from a technological 'coming of age'. Country Energy has developed a 5 year replacement program concentrating on replacing existing transmitters that have either:

- Insufficient capacity to support the connected loads or
- Become unsupportable in terms of spare parts or external support.

Where transmitters are replaced a possible additional investment in new frequency injection relays may also be required.

Substation operational and control buildings are maintained on a regular basis, and have a life of around 60 years. They are generally in good condition.

- *Subtransmission overhead powerlines, poles, and pole top components*

  Country Energy's network includes a range of subtransmission 132, 110, 66 and 33 kV powerline voltages and a range of different construction types. These powerlines total some 15,000 circuit kilometres.

  Over 1,050 kilometres of 66 kV and 33 kV overhead subtransmission powerlines, consisting of hard drawn copper or galvanised steel powerline conductor, have exceeded a service life of 45 years. Around 800 kilometres of powerlines have a service life of around 50 years or greater, and have been found to show increasing signs of weakening, environmental corrosion or rust.

  It is necessary to undertake a long term program to gradually replace the older generation steel and copper 66 kV and 33 kV overhead subtransmission powerlines, with a service life of around 50 years or greater, with modern constructions and components. The galvanised steel subtransmission overhead powerline replacement program will be primarily undertaken in inland areas, while the copper overhead powerline replacement program will be undertaken in both coastal and inland areas. A total of around 170 kilometres of subtransmission powerlines will be replaced annually, comprising around 130 kilometres of 66 kV overhead powerlines and 40 kilometres of 33 kV overhead powerlines.

- *Distribution overhead powerlines, poles, and pole top components*

  Country Energy's network includes a range of distribution powerline voltages 33, 22, 11, 19.1, 12.7 kV and low voltage, and a range of different construction types. These powerlines total over 166,000 circuit kilometres, and their components that are beginning to exceed their reasonable expected service lives.

  A wide variety of bare powerline conductor types have been used in rural areas including steel, aluminium steel reinforced conductor, and copper conductors. The engineering life of an overhead powerline and the development of replacement strategies are complicated by differences in the following factors:

  - Types of design, construction and historical maintenance practices
  - Growth rates in different areas, and
  - Environmental and climatic conditions.

  The design, construction and maintenance of powerlines have followed sound practice. Different regions can have different growth rates, which can impact on the economic life of the powerline. Overhead powerlines located in coastal areas have salt laden related issues that need to be managed, which can reduce the effective lives compared to more favourable inland areas.

  The light hard drawn copper conductor installed in the 1950s and 1960s is showing increasing signs of weakening in terms of maximum load to fracture strength, and environmental corrosion and weathering, particularly aged conductor located in coastal areas. The older steel conductor installed in the 1950s and 1960s is showing increasing signs of rust.

  It is necessary to undertake a long term program to gradually replace the older generation steel and copper high voltage overhead distribution powerlines, with a service life of around 55 years, with modern constructions and components. It is estimated than an average of 1,100 kilometres of 22 kV and 11 kV powerlines and an average of 240 kilometres of SWER powerlines will be replaced annually.

  The galvanised steel powerline replacement program will be primarily undertaken in inland areas, while the copper powerline replacement program will be undertaken in both coastal and inland areas. Overhead powerline replacement is also relevant to maintaining reliability performance and compliance with bushfire mitigation requirements.

The existing pole population managed by Country Energy is around 1.4 million strong. There are many different varieties used but they are predominantly treated and untreated hardwoods. The main failure mechanisms for these poles are decay from rotting, particularly where moisture is present, and from termite attack. Poles to be replaced are identified from the pole and powerline inspection program that determine the serviceability of wood poles and if the pole has retained sufficient residual strength.

Statistical analysis indicates that over the next 10 years, the number of poles reaching the end of their structural lives is expected to increase. The life of poles can be extended through pole reinstatement where suitable, which may be carried out in conjunction with refurbishment programs. Pole reinstatement can extend the pole life by 10 to 15 years provided the pole tops are in reasonable condition. However, the application of this option is no longer possible for poles that were previously reinstated some 15 to 20 years ago that are now reaching the end of their lives. Accordingly, the number of poles reaching the end of their structural lives is expected to increase over the next 10 years. Additional expenditure on pole replacement is expected for new streams of work reflecting the expected trend of increasing condemnation rates, ageing profile and higher failure rates that are expected as the benefits from pole saving techniques are exhausted.

Pole top structures include cross arms, insulators, and connectors. Pole top hardware is generally in good condition and is verified by regular field inspections. However unlike poles, there are no effective preventative maintenance programs that extend the life of pole top assemblies and as such, pole top components tend to deteriorate at a greater rate than poles. This results in a higher condemnation rate. Replacement of these items has particular relevance to our bushfire mitigation plans.

Programs are also in place to rectify older constructions with design standards that do not provide statutory powerline to ground clearances or do not meet clearance requirements for navigational waterways.

Low voltage overhead powerlines will be replaced based on historical expenditures.

- *Distribution substations and transformers*

  Country Energy's network includes some 131,000 distribution substations in service. Distribution substations include a range of different designs including kiosks, ground mounted, chamber, and pole mounted types. Distribution transformers, particularly pole top transformers, are relatively simple and inexpensive items compared with power transformers. Pad mounted transformers are normally more expensive to replace than pole mounted transformer.

  The remaining life of these assets and the replacement strategies are dependent on the types of design, construction and historical maintenance practices, transformer tank rust and corrosion, and the loading and the environment.

  Historical maintenance policies for pole mounted transformers have varied from an approach where replacements occurred only on transformer failure to another approach where detailed inspection, overhaul and/or replacement of tanks and oil were implemented. For the pad mounted and ground mounted transformers better maintenance practices have historically been applied due to their higher value.

  In general, in service distribution transformers are in good condition with the worst displaying rust or minor oil leakage. This is determined from regular inspection cycles. A major percentage of transformer replacement results from failure due to lightning strikes and load growth.

  Generally pole top transformers in the wetter eastern parts of the service area have shorter lives than in the drier regions.

- *Underground cables*

  Country Energy's network includes around 5,300 kilometres of underground high and low voltage cable in service representing around 2.5 per cent of the total network length. Underground cables are relatively new, and are not expected to require significant replacement over the next five years. High voltage 22 kV and 11 kV XLPE cable is generally in good condition.

  It is expected that the paper lead cable in service will continue to provide service beyond their expected 60 year life. There are no known problems with Country Energy's 66 kV and 33 kV subtransmission cable systems, which are less than 20 years old.

- *High voltage distribution switchgear equipment*

  To enable switching and protection of the high voltage distribution powerlines, Country Energy's network includes around 350,000 switches and fuses.

  Programs are in place to replace air break switches, reclosers, sectionalisers and other switchgear that have become unreliable, inoperable, pose a safety risk, or require major maintenance. The need for replacement is identified when the switches are operated.

  Country Energy's population of reclosers and sectionalisers can be reviewed as two separate populations of hydraulic and electronic units. The hydraulic units are in general 10 years older then the electronic units. Country Energy policy requires that all sectionalisers and reclosers be removed for a complete overhaul at a maximum period of 9 years. All refurbishment of reclosers and sectionalisers is based on condition and no programmed replacement program is envisaged. In the past, replacement of high voltage air break switches, fuses and links has usually been carried out on failure.

  Country Energy has commenced a long term program to replace high voltage air break switches with fully enclosed SF6 switchgear for safety and operational reasons. Older units will also be targeted. The major concern is the failure of the porcelain insulator resulting in large pieces of porcelain falling in the region of the operator. In addition the operation of the operating handle has resulted in back injuries when the contacts seize. The program is targeting a 5 per cent replacement (or 550 units) each year for the next 20 years.

  Country Energy has commenced a long term program to gradually replace porcelain high voltage fuses and links with polymer fuses and links, and to fit polymer insulators to secure the high voltage dropper tail for safety and operational reasons. Older units will also be targeted. The major concern is the failure of the porcelain fuses and links resulting in large pieces of porcelain falling in the region of the operator. In addition there is the potential for the tail from the fuse or link to fall down close to the operator or the pole transformer. The program is targeting a 3.3 per cent replacement (or around 11,000 units) each year for the next 30 years.

- *Overhead services*

  Country Energy's network includes around 665,000 overhead service cable connections. Services generally have a shorter life than mains, and replacement is an ongoing activity.

  The bulk of low voltage services are of the insulated type as opposed to the older style of bare conductor. Insulated overhead services are subjected to weathering and many are impacted by trees and vegetation. Failure results from broken or corroded neutrals, tears on the outer sheath and damaged or deteriorated internal insulation.

  There are some types that are not considered serviceable any longer and are targeted for replacement to current standards. There has been continuing issues associated with the failure of insulated service cable due to deterioration of insulation. During the *next regulatory control period,* Country Energy will continue prudent action involving the gradual replacement of these service cables over a 30 year period as recommended by DWE. It is expected that an increasing number of services will be identified as requiring replacement.

- *Metering and load control equipment*

  Country Energy's network includes over 1.4 million meters and around 0.5 million load control receivers in service at customer premises.

  The asset renewal capital expenditure projections have been estimated separately for new customer connections and for replacement.

  Meters are replaced due to failure, condition, inaccuracy, safety, and age. A useful life of 25 years is typical for electromagnetic meters and 10 years for electronic meters. As detailed in Section 5.9.6, the *Rules* require Country Energy to have meter asset management plans and systems in place to ensure the accuracy of each meter 'family' installed for types 5 and 6 metering installations. A specific asset renewal initiative program for older jewel/ball design meters will be implemented as supported by Country Energy's Metering Asset Management Plan.

  Load control receivers operate at customers premises via frequency injection signals sent over Country Energy's electrical network from the frequency injection plants.

  New generation relays will be installed in the retrofitting of load control areas, which previously had used non intelligent relays or time switches. In areas where no frequency injection signal exists currently, they will function as time clocks.

  The expenditure will ensure that Country Energy meets its obligations for accurate and safe recording of electricity consumption.

- *SCADA and communication equipment*

  SCADA and the communications network are key components in maintaining the reliability and quality of the network. It will be necessary to undertake a renewal and replacement program over the *next regulatory control period*, comprising:

  - Aged communications equipment for subtransmission system and zone substations
  - Communications and SCADA hardware no longer supported by manufacturers
  - Aged remote terminal units
  - Zone substation monitoring and control systems, and
  - Aged fault indicators.

  There is also the requirement for the installation of additional SCADA equipment for the security and safety of the network.

5.9 Forecast capital expenditure – environmental, safety, security and legal related

Existing and new legal and regulatory requirements are constantly monitored by Country Energy, and work is continually in progress to maintain compliance and to respond to changes in regulation.

Country Energy has made allowances in its forward projection expenditures for asset renewals due to environmental, safety, infrastructure security and legal requirements. All capital expenditure requirements in this category have the primary purpose of reducing the expected number and severity of environmental, safety and infrastructure security incidents. Country Energy assesses these issues using risk management techniques in order to prioritise issues based on their impact on the environment, public, customers, employees and reputation.

Country Energy's environmental, safety and security management programs and strategies are generally linked closely with other capital and operating programs. Accordingly, expenditures in some other categories, as discussed above, may have an impact on the risk of these types of incidents.

Country Energy forecasts that environmental, safety, security and legal expenditure requirements will average $41 million per annum in the *next regulatory control period.* This expenditure will ensure that the network will be maintained and operated in a secure and environmentally responsible manner that ensures the safety of all employees, customers and the general public.
The resulting forecasts for the planning period to 2013-14 are provided below.

Safety and Regulatory ($M 2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Sub-transmission lines and cables	-	-	-	-	-
Distribution lines and cables	13	15	16	16	17
Substations	14	16	17	17	18
Transformers	-	-	-	-	-
Low Voltage Lines and Cables	1	1	1	1	1
Customer Metering and Load Control	7	8	9	9	9
Communications	-	-	-	-	-
- Land	-	-	-	-	-
- Easements	-	-	-	-	-
Total - system capital expenditure	**36**	**39**	**42**	**43**	**45**

Table 5.9: Forecast of safety and regulatory expenditure for 2009-10 to 2013-14

5.9.1 Environmental, safety, security and legal forecasting methodology

Country Energy's approach to identifying and prioritising refurbishment and replacement expenditure for environmental, safety, infrastructure security and legal requirements is primarily based on historical expenditure trends, coupled with the implementation of new specific asset renewal programs.

5.9.2 *Environmental*

Expectations for responsible environmental management continue to be high. Country Energy will continue to be a responsible asset owner, and will promote leadership in the community by applying policies and practices which will protect the environment.

Country Energy's operations are impacted by environmental legislation relating to the construction, maintenance, operation and decommissioning of network assets. In response, Country Energy has embraced a range of environmental expenditure programs that are reflected through all aspects of the business.

The forecasts prepared for this review have been developed on the basis of continuing with the current level of existing environmental programs. These environmental programs primarily relate to:

- Replacement, treatment and disposal of in service PCB contaminated waste and equipment, such as transformers and capacitor banks in accordance with the National Strategy for PCB Management, the requirements of the PCB Chemical Control Order, industry guidelines for managing PCBs < 50 parts per million, and the expectations of due diligence
- Oil containment and bundling to minimise the risk of environmental damage resulting from oil spills from transformers and other oil filled plant driven primarily by EPA requirements
- Replacement of oil filled plant located in sensitive areas and improving oil filled plant storage facilities
- Improvements to depots and facilities that enhance environmental controls
- Removal of asbestos from sites regularly used by Country Energy employees

- Noise mitigation from power transformers through the installation of sound enclosures primarily driven by increased urbanisation and EPA requirements
- Conversion of bare overhead mains to covered conductor thick, underground or aerial bundled conductor (ABC) in targeted urban areas of high vegetation growth, overhanging trees, and to minimise environmental impacts of vegetation maintenance activities
- Mounting low voltage ABC cables on shop facades rather than poles
- Replacement of ozone depleting substances with suitable alternatives
- Greenhouse related programs such as capital investments which minimise energy losses (see below)
- Design and visual amenity of assets including tree planting and landscaping of zone substations, field service centres and other facilities
- Installation of efficient public lighting, and
- Relocation of powerlines from electric and magnetic field or radio frequency interference sensitive locations.

Electrical losses are incurred as power is transported along distribution wires. The losses increase with powerline length and higher asset utilisation. Currently, the cost of distribution losses is borne by retailers and passed on to customers through their retail prices. Although customer demand is a key driver of losses, distributors also have a substantial influence through their network configuration, and thresholds for reinforcement, asset utilisation and the loss levels of the network equipment installed.

Distributors should be encouraged to consider the cost of losses in decisions on network design and equipment selection. Country Energy recognises the benefits of reducing distribution losses and has implemented a planning policy that provides a basis for incorporating the cost of losses into planning decisions and augmenting solutions that incur the least overall cost to customers. This results in adopting optimum loss designs for components such as conductors and power transformers.

Country Energy plans to invest to maintain the current level of losses for the *next regulatory control period,* in the face of increasing growth in demand. This will be achieved by implementing subtransmission and distribution powerline improvements, transformer optimisation, re-conductoring works, and the construction of new feeders, many of which are related to growth related programs.

5.9.3 Safety related obligations

The *Electricity Supply (Safety and Network Management) Regulation* 2002 under the *Electricity Supply Act* 1995 requires safety plans to be lodged with DWE and implemented by Country Energy. This is also a condition of Country Energy's operating licence. This area also covers Country Energy's bushfire mitigation program, involving the identification and prevention of the causes of fire ignition and electrical safety incidents on its network. Other related legislation includes the *Occupational Health and Safety Act* 2000 (NSW) and related regulations.

Country Energy's safety related expenditure programs have been drawn together under its safety plans and safety management system. Country Energy's safety strategy has been developed to protect employees and the public while ensuring compliance with the various statutes and codes of practice.

The safety plans are independently audited on an annual basis to assess compliance with the regulation, the reliability and integrity of the information presented in the report, information relied on in the planning and selection of strategies, and to verify that all necessary measures for control of hazards and dealing with emergencies are in place.

Specific safety related asset renewal initiatives and programs to be implemented include:

- Rectification of existing overhead powerline constructions that do not meet clearance requirements for navigational waterways and installation of signage in compliance with the NSW Maritime, Crossings of NSW Navigable Waters Electrical Industry Code, which was recently introduced in 2008 and is now supported by Country Energy's policy document CEPG2382.

  A program has been developed to ensure that Country Energy achieves compliance with this new safety requirement within the timeframe specified in the code of practice.

  A risk assessment will be completed for all other river crossings. 'High' risk exposure crossings will be targeted for immediate rectification within the first year, and this may include the installation of submarine crossings. A ten year signage installation or replacement plan will also be implemented.

- The treatments for private pole defects have not been historically consistent and take into account past distributor practices and regional policies, which have resulted in inefficiencies across Country Energy. Treatments range from notifying customers of defects in their installation with a request that these be rectified, to subsidising undergrounding of overhead mains allowing pole removal, to Country Energy carrying out the work.

  Country Energy has the ultimate responsibility for ensuring the electrical safety of private poles. Where pole ownership cannot be clearly established through documentation, the maintenance responsibility will be assumed by Country Energy. This will provide acceptable risk outcomes for safety while providing a consistent approach across Country Energy.

- Country Energy has, and will continue to, monitor the performance of equipment in service, including hazard alerts issued by relevant industry bodies. Where appropriate we will initiate replacement programs for assets identified as operation or safety hazards, potential contributors to fire ignition and electrical safety incidents on its network. Safety related programs that will flow through into the *next regulatory control period* include, but are not limited to:
  - replacement of unsafe chamber substations
  - substation earthing upgrades to meet step and touch potential guidelines
  - replacement of uninsulated earthing installations consistent with ISSC recommendations
  - installation of low voltage spreaders
  - relocation and identification of powerlines around aerodrome transitional areas.
- Reconstruction of mains to increase powerline to ground clearance in intensive agricultural areas where powerlines are too low to the ground and other situations that present a risk to the public

- Replacement of two pole distribution substations that have known inherent design faults that has been recognised as a safety hazard

- Removal and replacement of all insulator type faults as identified

- Replacement of polymeric gap type surge arrestors, and

- Replacement of bare service wires in rural areas.

5.9.4 *Infrastructure security and protection obligations*

Country Energy is required to implement all appropriate preventative security measures to ensure the continued provision of supply and prevention of unauthorised access to electrical installations. However a significant proportion of Country Energy's assets were established at a time of low security risk.

A key program is zone substation perimeter security systems and fencing. In 2003, the Electricity Supply Association of Australia released new guidelines for the prevention of unauthorised access to various electrical installations, in particular zone and subtransmission substations, to address the recommendations of an investigation by the NSW Coroner into several fatalities in 2002.

Country Energy will continue to implement primary security measures to prevent unauthorised access to zone and subtransmission substations. This may include the installation of closed circuit television (CCTV), improved security fencing, locks, gate access and removal of perimeter vegetation.

An audit has been completed and risk ranking carried out. The risk assessment takes into account site location, condition of existing security systems and perimeter fencing, security history, local demographic risk, and exposure to high voltage conductors.

Capital expenditure is also required in developing contingency capabilities to manage loss of key infrastructure. The forecasts prepared have been developed on the basis of continuing with the current level of existing infrastructure security programs. However the substation fencing security improvement will require an increase in effort involving increases in capital expenditure.

5.9.5 *Undergrounding*

Country Energy is aware that there is strong and growing community and customer support to improve the appearance of overhead powerlines through undergrounding initiatives. This pressure arises from issues of road and electrical safety, reliability and quality of supply, environmental amenity, reduced vegetation control, and bushfire mitigation. In addition there is significant local government interest that generally requires that new developments have underground cabling.

Country Energy routinely assesses the viability of projects to relocate or underground higher risk assets and, where economic, will continue to underground or relocate assets. Undergrounding often proceeds where a local council has identified it as a priority and an agreement in terms of funding has been reached. However, in most circumstances relocation or undergrounding is not economic and continuation of vegetation clearing and maintenance of existing assets is the most economical solution to maintaining compliance with vegetation control.

Country Energy will over the *next regulatory control period* continue to consult with local government and environmental groups and seek community input into program priorities, identifying areas of significance, determining funding arrangements, and cooperate to develop and implement solutions for mutual benefits. Country Energy will take a proactive approach to undergrounding proposals and provide a framework that reinforces support for undergrounding initiatives that meet the wants and needs of the community or target hazardous locations, where it is economic to do so.

5.9.6 *Other regulatory related obligations*

Country Energy will implement a number of other programs to comply with the requirements of the *Rules*, including:

- Under frequency load shedding program, and
- Power factor correction program, including the installation of capacitor banks, based on the requirements.

Country Energy will also implement a program to install metering at all zone substations, primarily to improve network planning but also to provide information as requested by regulators.

Under the *Law*, Country Energy, in its capacity of responsible person for metering installations, must comply with inspection and testing requirements in accordance with the *Rules*. In particular, reasonable endeavours must be made to meet the accuracy tolerance requirements set out in the *Rules* and the National Standards Commission (NSC), under the *National Measurement Act* 1960, which provide requirements, mechanisms and enforcement for ensuring in service quality of utility meters.

These obligations require Country Energy to have meter asset management systems, test plans, instrument transformer testing including in situ sample testing and quality assurances in place to ensure the accuracy of each meter 'family' installed.

This renewal program is supported by Country Energy's Metering Asset Management Plan. The plan is based on the *Rules* for types 5 and 6 metering installations and applies to both first tier and second tier sites. Sample testing to AS1284.13 will be used for all types 5 and 6 meters, excluding older jewel/ball design meters, which will go into an immediate replacement program.

The replacement program will be initiated on a regional basis and is expected to involve the replacement of some 40,000 meters per annum through to 2013-14. As testing proceeds, any failed populations will be included in the replacement program.

5.10 Forecast capital expenditure – reliability and quality

Country Energy's structure is based on a geographic approach to network management and planning since it is not possible for a single centralised group to know and manage the complete network efficiently. Each part of the network is unique, and decision making on expenditure and reliability and quality of supply improvement is improved by using local input and experience.

The usage of electricity is continuously changing, as households become more dependent on electricity for quality of life services such as air conditioning, entertainment systems and home office systems. Inevitably, over time, because of changing demographics coupled with the rapid general growth in the use of sensitive electronic equipment and appliances, customer's perceptions and their requirement for reliable network performance have changed.

Country Energy understands that our customers and communities have increasing expectations in terms of electricity reliability and quality of supply. The business is focussed on ensuring that reliability and quality of supply is best practice for all areas and, in particular, the predominantly rural, overhead powerline network.

However, Country Energy's distribution network has been historically planned and developed to deliver differing levels of reliability and quality, which ultimately depend on its design. Reliability levels are also driven by historical maintenance philosophies, the environmental, geographical and demographic characteristics of the service area, the susceptibility of the overhead network, and the harmonisation of these factors with the economically viable cost of service provision and the level of supply that is acceptable to customers.

When the distribution network was first constructed, the objective was to provide an electricity supply to as many areas as possible. While adequate at the time, the network was never designed to provide the level of network service sought by customers today. For example, the predominately radial 11 kV and 22 kV overhead distribution network is the prime means of distributing power to customer premises. However the overhead distribution system has the greatest impact on the reliability of supply and represents the greatest proportion of customer minutes off supply. Faults on this system will often result in the loss of supply to customers. The cost of improving reliability by providing redundancy is prohibitive, however Country Energy has developed options to maintain and improve the reliability of supply.

In the traditional planning approach, reliability and quality of supply were not always given major consideration but was primarily the by product of other planning analysis. In recent times a major driver of expenditure, which is now receiving increasing attention from Country Energy, is works associated with improving reliability and quality of supply. Reliability, quality and security of supply is now prominent in its own right and network performance improvement of the distribution system is a key part of Country Energy's network planning process, which identifies system limitations and determines viable options for improvement.

As outlined in Section 3 of this *regulatory proposal*, Country Energy plans to focus on maintaining network service levels compatible with the requirements of the distribution *licence conditions*, to address identified customer requirements, to improve the reliability and quality at certain locations within the network that under perform when compared to *licence conditions*, and to make overall improvements to system wide average network supply reliability and quality. The distribution *licence conditions* require that a minimum average level of reliability performance by feeder type (urban, short rural and long rural) is maintained across the network, and that a minimum level of reliability for individual feeders by feeder type is maintained. This service will continue to provide high standards of performance when compared to comparable electricity distribution networks.

The *licence conditions* and customer expectations have a strong bearing on the specific asset management strategies adopted by Country Energy for reliability, quality and security of supply in the future. The proposed expenditure is aimed at implementing programs to improve average SAIDI and SAIFI reliability standards for each feeder type and to specifically target the reduction of the impact of faults and reduce fault duration for those feeders that deliver the lowest service levels. This includes the implementation of innovative actions to improve reliability of the poorly performing parts of the network.

Satisfying these requirements is a balance between implementing improvement initiatives, increased expenditure, and the availability of resources to perform the necessary work. Country Energy forecasts that reliability and quality related expenditure requirements will average $182 million per annum in the *next regulatory control period.* Expenditure increases from $165 million in 2009-10 to $191 million in 2013-14. The specific programs and actions are discussed below.

Country Energy has tabled below the programs and the level of capital expenditure that will be required for the planning period to 2013-14 in order to achieve outcomes comparable with the licence conditions and customers expectations.

Reliability ($M 2008-09)	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Sub-transmission lines and cables	4	4	5	5	5
Distribution lines and cables	148	160	165	167	170
Substations	6	6	7	7	7
Transformers	4	5	5	5	5
Low Voltage Lines and Cables	2	2	2	2	2
Customer Metering and Load Control	1	1	1	1	1
Communications	-	-	-	-	-
- Land	-	-	-	-	-
- Easements	-	-	-	-	-
Total - system capital expenditure	**165**	**179**	**185**	**188**	**191**

Table 5.10: Forecast of expenditure for 2009-10 to 2013-14 relating to distribution reliability, quality and security of supply

5.10.1 *Reliability and quality related forecasting methodology*

Country Energy's approach to identifying and prioritising reliability and quality supply related expenditure is in accordance with sound network planning practices. It is based on the implementation of specific programs.

- *Urban distribution network N-1 reinforcement program*

  For the distribution network N-1 work program, the expenditure forecast has been based on a 'bottom up' approach and individual projects have been identified, scoped and costed. The existing installed capacity, utilisation, configuration and security, and the future capability requirements and configuration of the high voltage distribution network in regional centres was analysed. This analysis was then used to determine compliance and, where this was not the case, develop the most technically acceptable solution and cost of augmentation.

- *Individual feeder reliability standards program*

  Country Energy's approach to identifying and prioritising reliability and quality supply related expenditure is in accordance with sound network planning practices. It is based on historical expenditure trends and implementation of specific programs, coupled with the asset renewal and replacement program.

  For the reliability improvement program, Country Energy has conducted extensive modelling and analysis to gain a detailed understanding of network performance and conditions that exist now and will emerge over the period from July 2009. It has applied a sound engineering based methodology that takes into account the inherent design and state of the network, expected environmental conditions, quality of reliability data, and consideration of the ongoing underlying causes of supply interruptions. Country Energy understands all the complexities throughout its network and the extent to which feeders will require remedial work to alleviate all or only some of the current and emerging reliability problems to achieve compliance.

  Country Energy's proposed program and estimation of costs is based on the estimated average cost of the package of initiatives that it will need to implement on an average 110 feeder segments each year.

  Country Energy will undertake numerous small projects which on a collective basis involve large sums of capital expenditure. A detailed assessment of work to be completed on each individual feeder has not been undertaken as the identification of actual poor performing feeders and underlying causes of reliability problems will change over time.

  Country Energy has however conducted historical analysis of the average 12 month cumulative number of non compliant feeders and the predicted long term average requirements, to forecast the number of feeder segments that would require remediation over the period to 2013-14. The analysis also took into account the inherent condition and state of the rural network, the climatic conditions that exist now and which are expected to emerge over the period to 2013-14, and the impact of the underlying causes of supply interruptions.

  Figure 5.7 below, shows the historical quarterly count of new and 12 month cumulative non-compliant feeders for each feeder category. The historical average 12 month cumulative number of non-compliant feeders has averaged 177 feeders for each quarter since the commencement of the licence conditions in August 2005. It is also evident that there has been a recent decline in the number of non compliant feeders that can be attributed to the greater focus and increasing reliability related expenditure.

However the number of non-compliant feeders is above the expected long-term average. This can be determined by considering the length of the high voltage distribution overhead powerline network, which is approximately 148,000 kilometres. Based on an average engineering life for overhead system assets of around 40 years, it is predicted that the average length of the network that would need to be rectified each year is around 3,700 kilometres. There are presently some 4,420 feeder segments in service, with an average length of around 33.5 kilometres. Accordingly the expected long-term average number of feeder segments to be rectified each year should be around 110.

On an average basis, a single feeder segment would be rectified for each non-compliant feeder. Accordingly, the number of poorly performing feeders exceeds the long-term average. This is expected to continue over the planning period to 2013-14 and beyond, unless there is an increase in the number of feeder segments that are allowed for in regulatory approved expenditure, which are presently 95 each year.

Country Energy has decided that it will implement the package of remedial initiatives on the long-term average of 110 feeder segments each year over the planning period to 2013-14 to improve the reliability performance of unsatisfactory rural feeders and reduce the number of non-compliant feeders towards the expected long-term average.

The determination of the annual number of feeder segments to be rectified has also taken into account the inherent state of the network and environmental conditions that exist now and which are expected to emerge over the period to 2013-14, and the consideration of the underlying causes of supply interruptions, in order to more accurately forecast the number of feeders that would require remediation.

In terms of climatic conditions, the reliability of the network is strongly influenced by its exposure to storms and the variability of weather patterns over time. A substantial proportion of interruptions to supply, results from lightning and storm activity. Over the last five years, rural NSW has experienced some of the worst drought conditions on record that has provided relatively mild atypical weather patterns, conducive to good reliability performance. This is clearly evident in the exceptionally good reliability performance of 2006-07 and the cumulative number of non-compliant feeders in the most recent quarters, where drought conditions prevailed.

Bureau of Meteorology data and analysis of Country Energy's supply interruption data, a threshold for a sharp rise in outage events for wind speed gusts at 80 km/h and above. The figure below shows the number of wind gusts recorded across the entire Country Energy network that exceeded 80 km/h. Apart from an obvious seasonality, there is a material decline in the number of damaging winds over the study period from January 2005 to February 2008, as shown by the orange line. The green line is a twelve month rolling average which also exhibits a material decline in spite of some seasonal surges late in 2007. The latter appears to coincide with an increasing level of average rainfall and a reduction in the number of regions across NSW that were previously drought declared.

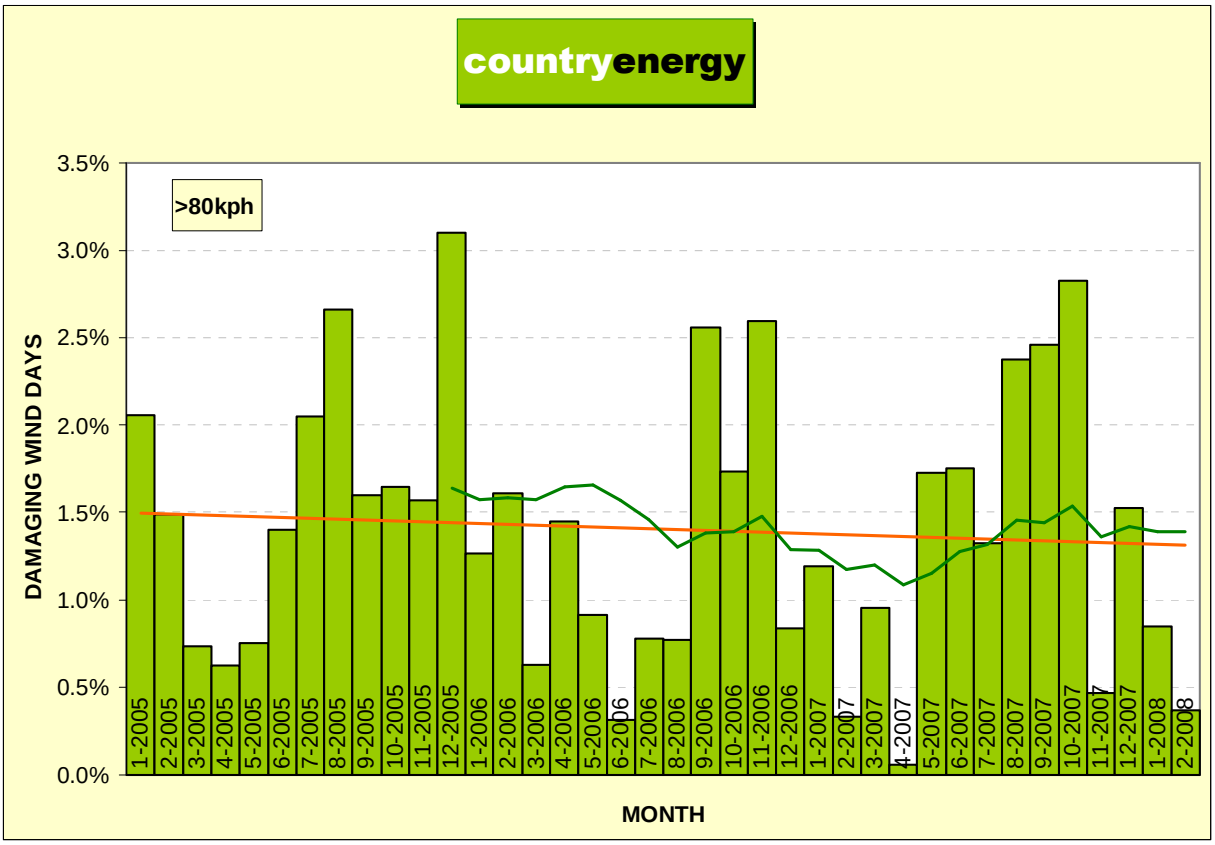

Figure 5.7: Country Energy Percentage of Days with Damaging Winds

On the basis of the relationship between gust wind speeds established above, it would be reasonable to expect to see a decline in the number of poor performing feeders. However, there is an expectation of a return to higher rainfall levels, and increasing storm activity and frequency in the medium-term, which is likely to increase the frequency of supply interruptions across the rural network and the number of non-compliant feeders due to a range of weather related issues. For example higher rainfall levels would also result in more rapid vegetation growth, likely to increase supply interruptions in the absence of an expanded vegetation management program.

- *Average reliability standards improvement program*

  It is practically difficult to identify and cost the many individual smaller projects that will form part of the complete program of work. Country Energy's proposed work program and estimation of costs has been on its 'bootstrap' modelling and the estimated number of sectionalising circuit reclosers to increase the degree of network segmentation to achieve a 20 per cent PoE. The prospective improvement in reliability performance using this approach was derived using an internal feeder segmentation model.

- *Quality of supply improvement program*

  Country Energy's approach to identifying quality of supply improvement requirements is primarily based on the cost of implementing specific programs.

  The assessment process focused primarily on whether the steady state voltage levels of an extensive sample of network voltage monitoring sites was outside the Australian Standard for over voltage and under voltage. The sampling ensured an adequate representation for all customer groups including domestic, industrial, commercial, rural and urban customers, and the adequate representation of different asset classes and feeder categories to which customers are connected such as overhead, underground, SWER, urban, short rural and long rural networks.

- *Licence conditions*

  The distribution reliability *licence conditions* are a key driver for reliability improvement investments in the network.

  The design planning criteria for distribution networks applicable to Country Energy is tabled below and is dependent upon the customer population (load) of the regional centre or town and the time required for supply restoration.

Network Element	Load Type	Forecast Demand or Expected Demand	Security Standard	Customer Interruption Time
Distribution Feeder	Urban (regional centres)	Any	N-1[1]	< 4 hours[2]
	Urban (other than regional centres)	Any	N	Best practice repair time
	Non Urban	Any	N	Best practice repair time
Distribution Substation	Urban & Non urban	Any	N[3]	Best practice repair time

Notes:

1 By 30 June 2014, expected demand is to be no more than 80% of feeder thermal capacity (under system normal operating conditions) with switchable interconnection to adjacent feeders enabling restoration for an unplanned network element failure. By 30 June 2019, expected demand is to be no more than 75% of feeder thermal capacity. In order to achieve compliance, feeder reinforcement projects may need to be undertaken over more than one *regulatory period*. In those cases where a number of feeders form an interrelated system (such as a meshed network), the limits apply to the average loading of the feeders within the one system.

2 The timeframe is expected only, and is based on the need to carry out the isolation and restoration switching referred to in note 1. This standard does not apply to interim/staged supplies, i.e. prior to completion of the entire development or to exclude interruptions outside the control of the licence holder.

3 Urban distribution substations shared, or available to be shared, by multiple customers are generally expected to have some level of redundancy for an unplanned contingency, eg via low voltage manual interconnection to adjacent substations enabling at least partial restoration.

Table 5.10: Distribution design planning criteria for Country Energy

A key change to the *licence conditions* for Country Energy is the requirement to bring the forecast peak demand of high voltage distribution feeders, located in regional centres, under system normal operating conditions, to a target utilisation of at most 80 per cent of the thermal design rating by June 2014. The target utilisation level refers to the ability to supply the load of an out of service feeder by transferring its load to four healthy adjacent feeders that are loaded to 100 per cent of thermal capacity, enabling the maximum number of customers to remain supplied.

Country Energy is required to maintain a minimum average level of reliability performance by feeder category across the network. It must not exceed in any financial year the annual average time customers may experience sustained loss of supply (SAIDI) and the annual average number of interruptions customers may experience (SAIFI), excluding momentary interruptions, that apply to the feeder categories.

Feeder type	2005-06	2006-07	2007-08	2008-09	2009-10	From 2010-11
Urban	140	137	134	131	128	125
Short rural	340	332	324	316	308	300
Long rural	750	740	730	720	710	700

Table 5.11: SAIDI reliability standards by feeder category for Country Energy

Feeder type	2005-06	2006-07	2007-08	2008-09	2009-10	From 2010-11
Urban	2.00	1.96	1.92	1.88	1.84	1.80
Short rural	3.30	3.24	3.18	3.12	3.06	3.00
Long rural	5.00	4.90	4.80	4.70	4.60	4.50

Table 5.12: SAIFI reliability standards by feeder category for Country Energy

An urban feeder is defined as a feeder with a load in excess of 0.3 MVA per kilometre. For lesser loads, a short rural feeder is defined as a feeder with a total route length less than 200 kilometres, while a long rural feeder is a feeder with a total route length greater than 200 kilometres.

Country Energy is also required to maintain a minimum level of SAIDI and SAIFI reliability for individual feeders by feeder category across the network, excluding momentary interruptions.

Feeder type	Minutes per customer
Urban	400
Short rural	1000
Long rural	1400

Table 5.13: SAIDI Individual feeder standards by feeder category for Country Energy

Feeder type	Number per customer
Urban	6
Short rural	8
Long rural	10

Table 5.14: SAIFI Individual feeder standards by feeder category for Country Energy

The *licence conditions* require Country Energy to continuously monitor the performance of all distribution feeders. Where the standard is exceeded, Country Energy is required to immediately investigate the causes of the performance, complete an investigation report and take appropriate remedial action.

- *General cost pass through application*

  In December 2005 Country Energy lodged a general cost pass through application with IPART, for the incremental capital costs relating to the imposition of the *licence conditions* in August 2005.

  Wilson Cook & Co reviewed Country Energy's expenditure program and was generally satisfied as to the rigour of the process used to identify the proposed works and the requested expenditures. It made recommendations to IPART in relation to the efficient incremental amounts of extra expenditure required by Country Energy, to meet the *licence conditions* at that time, for the remainder of the *current regulatory control period* to 2008-09, including:

  - Augmentation of individual subtransmission powerlines that exceeded the N-1 criteria for loads greater than or equal to 15 MVA
  - Augmentation of urban distribution feeders that did not comply with the N-1 in the major regional centres, and
  - Implementation of a suite of maintenance and capital investment initiatives forming part of a reliability remediation program for 95 poor performing feeders segments per annum at an average cost per feeder segment of around $1.23 million.

  IPART accepted Wilson Cook's recommendations. The approved capital and operating expenditure on reliability improvement and the availability of additional resources have supported the above actions.

  Country Energy's 2005 general cost pass through application did not include a works program to achieve a sustainable step change in the average reliability performance across the network.

- *Principle causes of interruptions to supply*

  The primary underlying causes of interruptions to supply, and the possible actions that can be taken to improve reliability, include but not limited to:

  - Line equipment failures and defects
  - Weather and storms
  - Vegetation
  - Failure of distribution protection
  - Overloaded equipment
  - Customer installations
  - Animals and birds
  - Vandalism and third party contact, and
  - Planned outages.

  Other intermittent and transient faults can be largely attributed to either operational problems with distribution protection equipment, vegetation or debris contact with overhead powerlines during windy conditions, or direct lightning strikes.

  All these factors are common to most other comparable electricity distributors that supply regional and rural areas.

  The strategies to improve average reliability across the network and local performance in poorer performing rural areas will need to address these particular causes of the interruptions to supply. In particular, the urban and rural overhead feeder equipment failures suggest that asset replacement rates have been below that necessary to improve performance. This is clearly an untenable situation for compliance with the *licence conditions*.

- *Individual feeder reliability performance*

  The figure below shows the quarterly count of new non compliant feeders and the 12 month cumulative non compliant feeders for each quarter for each feeder category since September 2005.

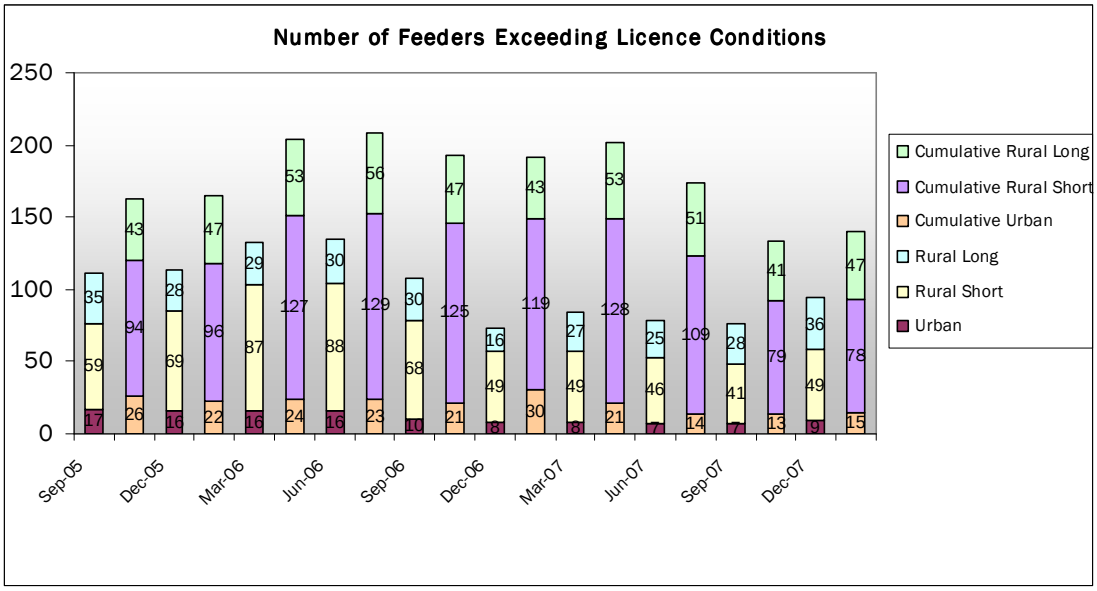

Figure 5.8: Network performance against individual feeder reliability standards by feeder type

A number of observations can be made in reference to the figure above:

- there are currently 140 cumulative non compliant feeders that exceed either both individual feeder standards (SAIDI and SAIFI) or exceed only one of the individual feeder standards. The average cumulative count of poor performing feeders since the inception of the *licence conditions* in August 2005 has been 177 feeders
- the number of new non compliant feeders has decreased over the last four quarters due to the favourable weather patterns
- there continues to be the emergence of new poor performing feeder segments or the re-emergence of previously rectified feeders as poor performers. We believe this has arisen primarily due to the continuing deterioration and ageing of assets, and the fact that Country Energy's current reliability remediation program does not involve the complete rebuilding of the whole feeder.

For short rural and long rural feeder categories, it is discernible that the number of feeders where performance is poorer than the individual feeder minimum reliability standards is significant. Country Energy will need to continue to implement expenditure programs for individual feeder improvement. This will be a key focus of Country Energy's reliability improvement program.

- *Feeder class average reliability performance*

  Country Energy has established a model that provides insight into the variability of the reliability performance, for SAIDI and SAIFI, for changes in weather patterns and the occurrence of other normal random events.

  The model quantifies the likelihood of actual average reliability exceeding the average SAIDI and SAIFI reliability targets set in the licence conditions for each feeder category. The measure of variability that has been used is the confidence interval or alternatively, the probability of exceedence, which is a contiguous range of values within which average reliability is likely to be found with some specified probability.

This modelling process makes use of Country Energy's actual daily reliability performance dataset (SAIDI and SAIFI) for the five year period from 2002-03 to 2006-07., A predicted SAIDI and SAIFI outcome is produced by re-sampling the daily SAIDI and SAIFI data. This selection process is repeated 365 times until an entire year's SAIDI and SAIFI data has been modelled. A set of 1000 of these sample years has been used in the model.

This re-sampling technique is a well known statistical approach and is used extensively for making confidence interval predictions using actual data.

The output from the modelling is a set of calculated probability distribution functions for SAIDI and SAIFI performance, for each network feeder type, given the historical performance over the period from 2002-03 to 2006-07. The SAIDI probability distribution for short rural feeder category is shown, as an example, below.

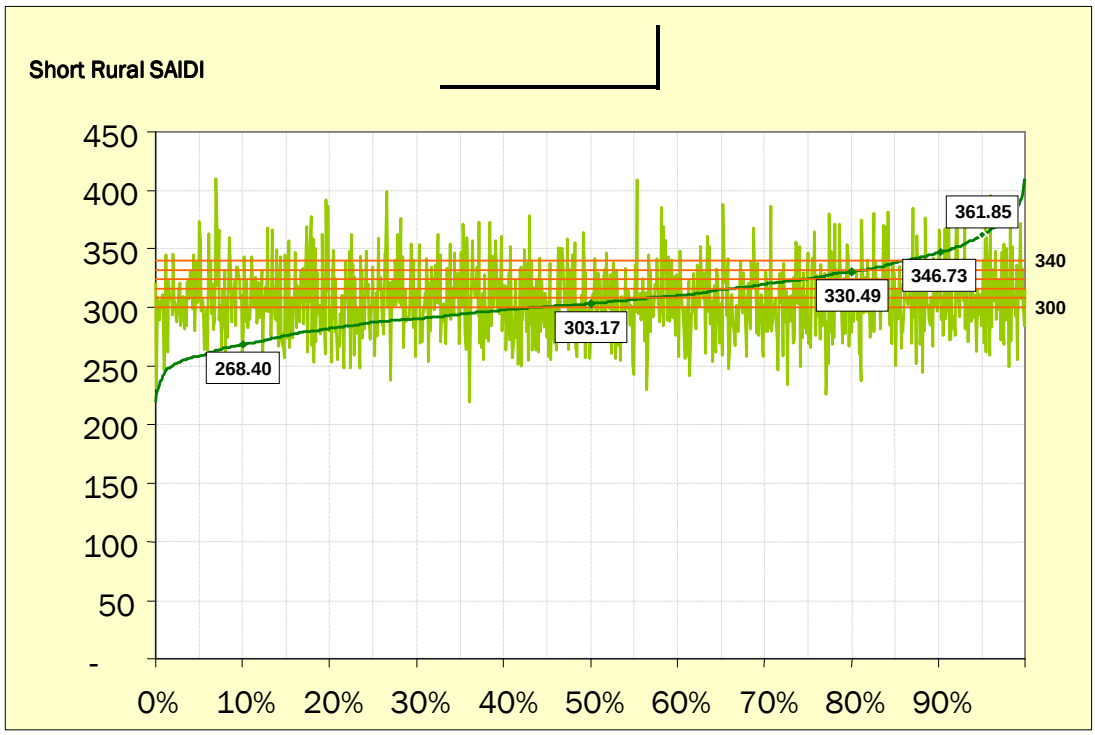

Figure 5.9: Probability distribution for short rural SAIDI

From the probability distribution analysis, for each feeder class, the following findings were made:

- For urban and short rural feeder categories, Country Energy is likely to exceed the average SAIDI and SAIFI reliability targets (required from 2010-11), at least once every 2 years if current performance is maintained over the period to 2013-14. The probability of exceeding these *licence conditions* is significant, and
- For long rural feeder category, Country Energy would expect to be compliant with the average reliability targets in the *licence conditions* in most years.

From this information, it is apparent that Country Energy will need to focus on improving the average reliability for urban and rural short feeder networks.

Country Energy's model was not available at the time the targets were set in the *licence conditions* or at the time of the 2005 general cost pass through application to IPART. From the calculated probability distributions, it could be said that the reliability standards for urban and short rural feeder categories are considerably more challenging than that contemplated when they were previously established.

5.10.2 *Reliability and quality related programs*

Although any individual reliability project may be relatively inexpensive, Country Energy will undertake numerous small projects over the *next regulatory control period* that on a collective basis involve large sums of capital expenditure. The works specified below are related to works over and above the 'core' asset renewal and growth related capital programs.

Country Energy will implement the following program to maintain and, where required, improve distribution reliability, quality and security of supply, including:

- Undertaking specific reinforcement and augmentation capital investments to obtain an N-1 security of supply planning criteria for high voltage distribution feeders in regional centres as set in the *licence conditions*
- Improving average reliability performance across the network, for the urban and short rural feeder categories, to a 20 per cent probability of exceeding the SAIDI and SAIFI targets set in the *licence conditions*
- Maintaining average reliability performance across the network, for the long rural feeder category, to the SAIDI and SAIFI targets set in the *licence conditions*
- Improving individual feeder reliability performance, for SAIDI and SAIFI towards the standards set in the distribution licence standards, and
- A system wide steady state voltage improvement program.

The intended work programs are generally in line with the current work programs, albeit with a higher resource requirement for new work programs.

The subtransmission and zone substation N-1 reinforcement program has been identified in the growth related work program as Country Energy is finding that it has increasingly limited spare capacity in some parts of its subtransmission network as N-1 security of supply is being eroded at a quicker rate. This is principally due to the strong peak demand growth, a change to a summer peak, and a relatively high utilisation.

We do not believe there is any discretion within these capital investment programs, as it is aimed at maintaining performance compatible with the *licence conditions*.

- *Urban distribution network N-1 reinforcement program*

  Country Energy has been in the process of implementing an N-1 capital works program across all high voltage distribution networks in regional centres since the initial release of the *licence conditions*. Resources to complete the construction works were available. However, there has been a delay in the commencement of the works due primarily to the uncertainty surrounding the changes to the *licence conditions*, which needed to be fully assessed and planned, prior to settling on a firm program of works to achieve the new 80 per cent feeder capacity utilisation standard. For these reasons, a proportion of urban distribution feeder reinforcement capital works remain to be completed.

  Following the release of the revised *licence conditions* in December 2007, Country Energy has undertaken a detailed review of the network, developing its asset strategies, and identified the specific projects to be completed for compliance to be achieved by June 2014.

  Country Energy is not compliant in terms of the standards relating to the high voltage distribution network in most regional centres. Country Energy's analysis indicates that major augmentation and reinforcement works will be required for a number of high voltage distribution feeders that are operating with utilisation levels that exceed, or are fast approaching, the 80 per cent utilisation standard.

Country Energy previously limited loading on its distribution feeders to 100 per cent of the thermal design rating. To achieve the 80 per cent utilisation requirement, Country Energy will need to build additional transfer capacity into its distribution feeder network through the construction of new, or the uprating of existing, network assets, and provide for the sharing of load through switchable interconnection to adjacent feeders.

Country Energy has developed a number of targeted asset strategies for regional centres that are designed to provide sufficient capabilities for an applicable N-1 contingency scenario or where the utilisation of existing assets is approaching the accepted maximum level as required by the *licence conditions*.

Expenditures under the program fall into 5 major categories:

- Construction of new urban distribution feeders from existing zone substations
- Construction of new interconnections between adjacent urban feeders
- Capacity upgrading of existing urban distribution feeders
- Installation of open tie point reclosers at the urban feeder extremity to allow loop automation between adjoining feeders, and
- Installation of fully enclosed gas switches.

The implementation of these strategies in regional centres is expected to increase network security and the ability of feeders to accept load transfers in the event of a fault on interconnected portions of the network and, as a second order effect, increase capacity and resilience of the urban network to meet future demand growth.

A total high voltage distribution feeder capital expenditure program of approximately $210 million has been identified for completion over the planning period to 2013-14. This capital expenditure is additional to the core growth related programs.

- *Individual feeder reliability remediation program*

  Country Energy has some 1,331 high voltage distribution feeders, comprising 293 urban feeders, 802 short rural feeders, and 236 long rural feeders. There are a variety of reasons for some customers receiving low service levels in some areas of the network. The most significant are the remoteness of some customers due to the size of the service area, the length of the supplying infrastructure and condition of asset components, network configuration and design, low customer density, the condition of asset components, aggressive environments such as vegetation and storms, and the cost of improving reliability.

  Certain feeders are repeatedly low reliability feeders. The implementation of traditional 'business as usual' core work programs is less effective for these types of feeders.

  Older generation conductors are showing signs of rust, weakening, environmental corrosion and weathering. Many faults on the rural network can be attributed to condition and age of these powerline conductors, and the supporting pole top structures. While ageing conductor has been monitored over the years for condition, reliability and safety, the extent to which these older rural designs have been upgraded has varied, particularly in the older poorer performing parts of the network where load growth has been low.

  Where a feeder does not comply with the *licence conditions*, Country Energy must complete an investigation identifying the causes and as appropriate, undertake action required to improve the performance of the feeder to the required standards.

Country Energy's focus on meeting *licence conditions* on the individual feeder standards since its introduction in August 2005 is demonstrated by the proactive remediation work that has been carried out on individual feeder improvement projects, contributing to this important objective and delivering local performance improvements. However, the number of poor performing feeders continues to be high as discussed above. We believe this issue has arisen primarily due to the condition, deterioration and increasing age of network assets. This is a serious issue that Country Energy is committed to addressing within the limitations of available and efficient solutions for reliability improvement.

For the *next regulatory control period*, Country Energy is committed to continue direct investment in feeders that deliver the poorest service level. A structured reliability remediation program will be employed that is designed to proactively address the principle causes of interruptions in rural feeders.

The program will include the implementation of the following suite of capital investment initiatives on each rural feeder segment selected:

- Advancing the replacement of bare overhead conductor and pole top hardware
- Extensive program of recloser and sectionaliser installation, and
- Depending on the economics of the project and the availability of existing infrastructure, capital investments may also include constructing or reinforcing tie feeder capacity to other rural feeders, or constructing new small rural zone substations.

The program also requires the implementation of the following suite of operational and maintenance initiatives (included in the operating expenditure forecasts of the *regulatory proposal*) on each rural feeder segment selected:

- Reviewing the coordination of feeder protection devices
- Implementing a rigorous vegetation control program
- Implementing an annual helicopter inspection of all poor performing distribution areas and radial subtransmission powerlines, and
- Implementing live line pole top inspection and planned maintenance on backbone segments.

These initiatives are described in detail in Country Energy's Reliability, Quality and Security of Supply Management Plan included in the *NAMP*.

They represent a 'shopping basket' of reliability improvement initiatives. The effectiveness of each initiative will depend on the individual local circumstances, operating conditions and network characteristics.

It is important to note that Country Energy's remediation initiatives will be focussed on the high priority segments of the rural feeder where the greatest gains in reliability can be achieved. Country Energy will not be rebuilding the whole feeder. Spending will be tailored to the controllable problems identified, with a cost effective package of initiatives developed for each individual feeder segment selected.

Country Energy will implement the package of remedial initiatives on an average 110 rural feeder segments each year for the planning period to 2013-14, to improve the reliability performance of identified poor performing feeders. We believe this is a relatively conservative number based on the historical trends and the analysis of the key technical factors that impact on the apparent performance of Country Energy's rural network.

Country Energy's estimation of costs is based on the suite of initiatives that will need to be implemented for an average 110 feeder segments each year.

The total incremental average real cost of implementing these strategies is approximately $470 million in capital expenditure. This expenditure is additional to the core work programs.

The feeder reliability improvement can be achieved at an average total real cost of around $1.3 million per feeder segment. The work program complements existing 'core' programs and strategies.

The implementation of the rural feeder remediation program is a priority for the business in the medium term, and will result in local improvements in performance. There is no discretion in terms of this asset management strategy in order to achieve the mandated standards of performance.

- *Average reliability standards improvement program*

  This works program is a newly considered element of Country Energy's asset management program.

  While individual feeder reliability improvement expenditure is important in the context of meeting local requirements, it will not produce a significant shift in average network performance by feeder class. Similarly, the capital investment to meet the design planning criteria has a marginal second order improvement impact on average reliability across the rural network as it is primarily urban based.

  There have been no systematic programs implemented by Country Energy to improve average reliability levels across the network or across feeder categories.

  Improving average network reliability performance to meet *licence conditions* and customer needs is now an important focus for Country Energy. Accordingly, Country Energy intends to implement a new system wide works program over the planning period to 2013-14 to achieve a sustainable step change in the average reliability performance across the network.

  The objective is to narrow the reliability performance gap between current performance and a level of reliability performance to achieve an acceptably low risk of non compliance with the reliability standards for urban and short rural feeder categories. However, it is important to note that average reliability improvement issues will take many years to address. The level of investment in system wide improvements is dependent on the probability of exceeding the *licence conditions* and accordingly, the reliability performance gap to be eliminated.

  Country Energy is proposing to lift average reliability performance, for the urban and short rural feeder categories, to a 20 per cent probability of exceeding the SAIDI and SAIFI targets by the end of the planning period in 2013-14. This means that the reliability standards are not expected to be exceeded more than once in 5 years, as compared to the probability distribution for current performance, which is 1 in 2 years.

  The 'bootstrap' model indicates that the long rural feeder category will be within the risk level of 20 per cent PoE.

  To achieve a 20 per cent PoE, Country Energy will need to target a level of average reliability that is less than the reliability targets set in the *licence conditions*. Accordingly these standards have been adjusted by the ratio of the current mean reliability performance to the 20 per cent PoE. This means that Country Energy will need to improve average reliability performance such that performance at the 20 per cent PoE level equates to the reliability standards in the *licence conditions*.

  The SAIDI and SAIFI reliability performance gap, which is the difference between the current mean reliability performance and the adjusted target, represents the improvements that must be made to 2013-14 to ensure an acceptably low risk of non compliance with the *licence conditions*.

The reliability performance gap for each of the feeder class is tabled below.

Feeder type		Current performance (mean)	Reliability targets at end of next period	Adjusted targets at end of next period	Reliability performance gap for 20% (adjusted for other programs)
SAIDI (minutes)	Urban	133	125	108	20
	Short rural	305	300	276	25
	Long rural	533	700	635	n/a
SAIFI (interruptions)	Urban	1.80	1.80	1.62	0.18
	Short rural	2.83	3.00	2.83	n/a
	Long rural	4.12	4.50	4.22	n/a

Table 5.15: Reliability performance gap for each feeder category

The reliability performance gaps in SAIDI performance are 20 and 25 minutes for the urban and short rural feeder classes respectively, and the reliability performance gap for SAIFI performance for the urban class is 0.18 interruptions. Adjustments have been made for expected reliability improvement from the implementation of other programs for each feeder class.

These adjusted targeted levels of performance will form the basis for feeder class reliability specific improvement strategies and investment. The objective is to narrow the reliability performance gap for urban and short rural feeder categories to achieve an acceptably low risk of non compliance with the reliability standards for the urban and short rural feeder classes.

The capital investment to improve average reliability performance for the urban feeder class will focus primarily on an extensive rollout of reclosers to increase feeder segmentation, where technically feasible, in the following locations:

- mid feeder in conjunction with the implementation of a distribution loop scheme
- downstream of major commercial or other sensitive customers to provide segmentation of these loads
- major urban radial feeders
- at the urban boundary of the feeder, and
- any other known or expected problem areas.

This program will be in addition to the installation of open tie point reclosers between adjacent urban feeders, in regional centres, to allow loop automation between adjoining feeders for distribution N-1 purposes.

The capital investment to improve average reliability performance for the short rural feeder class will also focus on an extensive rollout of reclosers to increase the degree of segmentation. This program will be in addition to the proposed installation of reclosers on poor performing feeders.

The feeder segmentation strategy will be supplemented by the limited penetration of remote control high voltage enclosed gas switches in urban and short rural areas.

The total incremental average real cost of implementing these strategies is approximately $120 million in capital expenditure over the planning period to 2013-14. This expenditure is additional to the core work programs.

Country Energy considered a service level for the urban and short rural feeder categories that would lift average reliability performance across the network to a 5 per cent probability of exceeding the SAIDI and SAIFI targets by the end of the planning period in 2013-14. This would have meant that the reliability standards would not be expected to be exceeded more than once in 20 years.

While desirable in principle, Country Energy would be required to address fundamental design standards, network configuration, and the many limitations of the current electricity network. Country Energy believes that the resource requirements for the program and the costs to customers would be prohibitive.

Network performance changes only begin to reflect in average network performance in the medium to long term. Progress towards eliminating the reliability gaps will be measured annually. This will require the recalculation of 5 year probability distribution functions, using the 'bootstrap' model, and a review of the adjusted targets to ensure that they remain appropriate.

Country Energy believes that these proposed actions accord with responsible asset and reliability management.

- *Quality of supply improvement program*

  The nature of quality of supply issues includes, but is not limited to:

  - steady state voltage variations from acceptable levels (over voltage and under voltage)
  - short term voltage dips and swells
  - voltage unbalance
  - excessive harmonic voltages and flicker, and
  - television and radio interference.

  Power quality problems tend to be less noticeable compared to a supply interruption and many power quality problems, such as sustained over voltage, may go unnoticed by customers. In many cases, supply quality problems are often difficult to trace.

  The *licence conditions* require the distributors to *'...maintain voltage levels within limits published by licence holders*'. Country Energy's document Electricity Supply Standard seeks compliance with the *licence conditions* and details a nominal 230/400 volts and a range of +10 per cent and -2 per cent from nominal. This objective complies with AS 60038-2000 Standard Voltages.

  Steady state voltage outside limits, particularly over voltage, has been identified as the most important power quality issue requiring attention. Country Energy has quantified the extent of steady state voltage quality problems across its distribution network and the likely costs to rectify these problems.

  It is important that Country Energy implements plans to manage the network to improve steady state voltage performance so that customers can receive a more suitable electricity supply. The initiatives to improve steady state voltage performance include:

  - Long term capacity augmentation of rural feeders and isolating transformer upgrades to address under voltage resulting from incremental load growth
  - Long term upgrading of undersized distribution transformers and dedicated customer connection assets to address local under voltage problems resulting from incremental load growth
  - Implementing plans for the correct setting of voltage regulating relays settings and in field changes to distribution transformer tap positions to address over voltage issues

- Installation of a network monitoring system to monitor and help deliver supply within the required parameters and allow a proactive management approach of power quality to be commenced. The key elements of the system include establishing a power quality data warehouse, developing a mining tool, and purchase and installation of field monitoring equipment to capture power quality data, in particular steady state voltage information. Revenue 'smart' meters with power quality measuring capability will be used for this purpose.

The total incremental average real cost of implementing these strategies is approximately $53 million in capital expenditure over the planning period to 2013-14. This expenditure is additional to the core work programs.

All these programs and initiatives are described in detail in Country Energy's Reliability, Quality and Security of supply Management Plan included in the *NAMP*.

5.11 Forecast capital expenditure – non-system

5.11.1 Non system capital expenditure

Country Energy must also invest in non system assets to ensure it can continue to deliver appropriate levels of service in a safe and efficient working environment for its employees.

This category of expenditure includes a number of miscellaneous items that will be required to support an efficient electricity distribution business, including:

- Information systems development and upgrades, and other computer hardware, software, licences, other information technology technical equipment, plant and equipment relating to information technology assets, and associated expenditure required to operate the business
- Telecommunication systems such as trunk mobile radio, faxes, mobile phones
- Motor vehicles and heavy plant
- Land, building and property works, and
- A number of other miscellaneous expenditures such as general office equipment, furniture and fittings, miscellaneous small plant and test equipment.

Country Energy forecasts that non system related expenditure requirements will average $143 million per annum in the *next regulatory control period.* Expenditure decreases from $168 million in 2009-10 to $138 million in 2013-14. This expenditure will ensure the continued efficient management and support of the electricity distribution business.

5.11.2 Non system related forecasting methodology

Country Energy's forecasts of non system requirements have been internally prepared in accordance with current standards and policies, needs, required quantities, and age of non system assets.

Various non system related policies and procedures that are utilised to assist in the development of Country Energy's non system forecasting are provided in Pro forma 2.3.6.

Country Energy's approach to identifying and prioritising non system related capital expenditure is in accordance with sound planning practices. It has been based on historical expenditure trends, coupled with specific asset replacement programs and the increasing technical and field employee levels.

5.11.3 Non System related programs

Country Energy must invest in non system assets to ensure it can continue to deliver appropriate levels of service in a safe and efficient working environment for its employees, and ensure the continued efficient management and support of the electricity distribution business.

The specific programs and issues to be addressed are summarised below.

- *Information systems*

  Country Energy continues to make significant investments in its information technology, facilitating the delivery of electricity distribution services. At the formation of Country Energy in 2001, major systems of the merged entities were rationalised in a 'best of breed' approach. In some cases, the existing systems were found wanting for the needs of the new organisation and new systems were acquired. In other cases, where system functionality was not available in the market, vendor partners assisted Country Energy to build or extend its required systems and infrastructure. Some of these systems have been developed in relative isolation and to different vendor standard. A degree of integration of systems and data has taken place but data definition and quality vary between systems, leading to much exception handling and business rework. More work is required on business processes mapping and system architectures and data definition, at the same time as infrastructure and systems are maintained and replaced according to financial and technical lifecycles, to achieve the better quality needed to support operational excellence.

  Country Energy has completed a detailed review of its business information systems for the period to 2013-14 with consideration of business objectives, drivers, and influences, and has recognised the need for the continued strategic investment.

  The drivers of capital expenditure in this category are in the form of either:

  - Purchase of new infrastructure and business system capabilities
  - Replacement of ageing, unsupported, or obsolete infrastructure and business system
  - Upgrade, enhancement or modification to the functionality of an existing business system to meet new responsibilities or compliance obligations
  - Greater integration of business systems to ensure consistency in data across core systems, and
  - Implementation of infrastructure security technologies to protect business information and infrastructure from new threats.

  The level of expenditure on information systems may fluctuate from one *regulatory period* to another because of the need to replace or upgrade systems that were not implemented in a previous *regulatory period*. Underpinning this investment program is our ICT strategic plans and the base level of information system expenditure to support general business purposes, with expenditure forecasts based on the experience of implementing similar projects and systems at Country Energy, and in accordance with good practice information technology asset management.

  The projected expenditure over the *next regulatory control period* is forecast to be generally consistent with historical spend. Over the *next regulatory control period* information system investment is forecast to average $53 million per annum including two major expenditures described below.

- *Asset management systems*

  Country Energy has an integrated suite of asset management support systems including the WASP asset management system and the SmallWorld GIS that tracks asset maintenance and capital works, provides job and project costing and reporting.

The contemporary requirements for asset management business systems are based on an ability to support a single integrated enterprise view of the operational assets. Country Energy recognises that the existing business systems supporting asset management require a greater degree of integration than currently exists. LogicaCMG has been commissioned to lead a detailed functional review of key systems in terms of business support and technical robustness. It has been estimated an average $10 million per annum for this *next regulatory control period* to undertake a review and replacement of our asset management business systems.

The capital expenditure forecasts also include:

- Effort required to transfer from existing systems to new systems
- Various upgrades of hardware elements and software applications
- Application enhancement and additional functionality
- Tighter integration and inter linkage of the new system with other applications
- Greater available of the asset management system to all sites performing supply chain, logistics management, human resource management, and other related activities
- Enhanced decision support information to assist with asset maintenance and works program planning, and
- Ring fencing compliance including the provision of greater access to third parties, for activities such as customer supply extension requests, using portal technology subject to the appropriate security and firewall controls.

This investment will have a direct impact on the effective management of network assets by providing the 'intelligence' to support our asset management strategies and decisions.

- *Network quality monitoring systems*

  Country Energy is committed to decrease the service gap between rural and urban customers by continuing to identify and action supply quality issues that affect our customers and to deliver a new system wide voltage quality improvement program to maximise customer satisfaction.

  Country Energy commissioned a study to better understand network steady state voltage quality problems and to quantify options aimed at improving these problems for the benefit of Country Energy customers. Country Energy is required to comply with the *licence conditions*, Australian Standards and *Rules* requirements as well as Country Energy's own requirements specified in its Electricity Supply Standard. In order to adopt a proactive management approach to power quality, Country Energy will require establishing a robust network monitoring system.

  Country Energy already has a basic network monitoring system and will need to further develop its current system as this is seen as an important tool for the ongoing management of voltage levels. It will allow the network to be monitored to help ensure the network is delivering supply within the required parameters and to monitor network performance into the future. The development of the network monitoring system will include:

  - Establishment of power quality data warehouse and development of the automatic transfer of data from the corporate revenue meter database
  - Development of the existing data mining tool to include reporting and alarming, and
  - Installation of more monitors in the field and zone substations.

  It has been estimated an average $1 million per annum for this *next regulatory control period* to develop the new network monitoring system.

Customer management and market systems

Country Energy operates a customer information and billing system, *Energy*, which provides a single engine for customer billing, revenue collection, debt management, customer inquiries, new connections, processing customer movements, and regulatory reporting.

An estimated cost of $20 million has been allowed for 2009-2010 to upgrade the CIS. The current system is over seven years old and due to the continually evolving market environment the system has required customisations. Country Energy's ability to take advantage of product upgrades has been diminished as a result. Further, the vendor of the system has been acquired by a venture capital firm who do not see a long term future for this system in their portfolio.

- *General business purposes*

  Country Energy will be required to maintain a number of ICT systems and processes for the following purposes:

  - Support an increasing number of users
  - Meet changing business requirements
  - Ensure that systems keep up with the latest technology, and
  - Ongoing support is available as items reach the end of its useful life.

  These modifications and enhancements are generally ongoing and are routine in nature. Capital expenditure forecasts include:

  - Mainframe infrastructure and server consolidation
  - Communications layer such as wide area network, network performance, mobile and radio networks, mobile services and rollout of fibre or services to zone substation for their intelligent management and mitigation of problems
  - Videoconferencing and Internet Protocol telephony
  - Growth in personal computers, printers and other peripherals and facilities
  - Development of a cohesive information architecture including design of corporate data warehouses and interfaces for data consolidation and reporting
  - Application suites such as PeopleSoft, project management systems, Objective
  - Security, service and performance management, and
  - Other supporting hardware and software licence growth, enhancements and modifications.

  Also included are the costs for licence and system updates to enure the ongoing support and maintenance of these systems by the software application support providers.

- *Heavy plant and light vehicles*

  Country Energy's fleet comprises around 2,000 heavy vehicles and 2,100 light fleet vehicles. The purchase of heavy and light fleet is a large category of capital expenditure for Country Energy. Under this program, Country Energy will continue to invest in heavy plant, vehicles, and other assets necessary to support its work programs and provide a safe and productive work environment for its employees. All purchases of fleet items are undertaken in accordance with Country Energy's procedural guidelines and corporate purchasing policy. Business cases assessing whether to buy or lease larger fleet items such as EWPs and crane/borers are completed.

  Strategic initiatives and changes to fleet management, such as changes in the lives for which different categories of fleet items are held by Country Energy before replacement or rebuild are subject to detailed financial analysis and business cases.

The majority of fleet purchases are made under State Government contracts. Purchases of larger heavy fleet items, such as EWPs and crane/borers, are made under period contracts subsequent to a tender process.

Country Energy's document CEP2150 Elevating Work Platform Major Refurbishment Requirements sets out standard inspection procedures, which establish a preventive maintenance and refurbishment program for EWPs. This program conforms to Australian Standards AS2550.10-1994, AS1418.10-1996 and AS4748-2001. Each EWP is subjected to a major inspection after a maximum of 10 years of service and every 5 years thereafter.

The required expenditure is based on expected employee levels, the known timing of replacements for the existing light fleet, as well as the purchase of new heavy plant in accordance with condition assessment. In accordance with this policy, Country Energy has conducted a detailed heavy plant condition assessment, which has identified a range of capital expenditures to address issues of workplace health and safety, operational requirements, purchase of new heavy plant in accordance with condition assessment, the known timing of replacements for the existing light fleet, and expected future employee levels. This review has provided a sound basis for identifying and prioritising the necessary new and replacement vehicles and plant. Budgeting and forecasting for fleet capital expenditure is based on designated life cycles for the various heavy and light fleet items and is therefore relatively predictable and stable.

The capital expenditure forecast for heavy vehicles is based on renewing existing plant generally at the end of their 10 year useful operational life in accordance with Country Energy's policy guidelines. Beyond this age, the EWP require an extensive refurbishment to meet electrical safety requirements for use in the maintenance, construction and/or live line work. Additional EWPs also forecast to be purchased over the *next regulatory control period* for additional crews to undertake the increasing volume of planned capital investment and maintenance work, including the more widespread use of live line work.

The forecast expenditure for light vehicles is based on replacing the existing fleet in accordance with Country Energy's policy guidelines for operational vehicles. These vehicles are replaced at 100,000 kilometres. Additional light vehicles have been forecast over the *next regulatory control period* for additional employees requirements.

Over the *next regulatory control period* expenditure on plant and vehicles is forecast to average $54 million per annum.

- *Land, building and property works*

  The age of the electricity network and growth rate indicates that increasing amounts of expenditure will be required to maintain and replace network components. These maintenance and replacement activities will require additional personnel, materials movements and vehicles.

  A number of regional offices and field service centres are currently at, or nearing, capacity and cannot accommodate these increasing requirements in their present form. Capital investments will be required in the form of building modifications, rebuilds, and/or extensions. It will also be necessary to continue the program of depot refurbishments due to building condition to provide a safer, more efficient and secure working environment.

  Over the *next regulatory control period* expenditure on land and buildings is forecast to average $21 million per annum. Land and easement acquisition and building costs for growth related network augmentation work is included in the growth related expenditure program.

- *Other miscellaneous capitalised items*

  The forecast expenditure on other miscellaneous capitalised items such as tools, test equipment, furniture and office equipment are in line with current levels of expenditure and activity levels.

5.12 Summary of capital expenditure forecasts for the *next regulatory control period*

Forecast expenditures for *Standard Control Services* have been separated and presented in line with cost activity centres specified in the IPART regulatory accounts and the accompanying *AER* information templates. Country Energy's forecast of capital expenditure relating to *standard control services* for the *next regulatory control period,* assuming a base growth scenario, is summarised in Table 5.16 below.

Country Energy has forecast productivity gains in resourcing its internal programs of work in accordance with Country Energy's resourcing plan detailed in Appendix A.

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
System related					
Asset renewal/replacement	138	155	165	173	183
Growth	249	275	291	302	314
Reliability and quality of service enhancement	165	179	185	188	191
Environmental, safety and statutory obligations	36	39	42	43	45
LESS: Productivity Gains	(3)	(7)	(7)	(7)	(8)
Total system capital expenditure	**584**	**642**	**675**	**699**	**725**
Non system related					
Information technology	64	49	49	50	51
Furniture, fittings, plant & equipment	11	10	9	10	9
Motor vehicles	60	52	52	52	53
Land and buildings	28	21	20	19	20
Other non system assets	5	5	5	6	6
Total non-system capital expenditure	**168**	**137**	**136**	**137**	**138**
TOTAL CAPITAL EXPENDITURE	**752**	**779**	**811**	**836**	**863**

Table 5.16: Forecast Capital Expenditure for *Standard Control Services*

During the *next regulatory control period,* Country Energy estimates that of total forecast capital expenditure:

- 35.4 per cent of will continue to be directed at investments necessary to meet demand
- 47.7 per cent will be directed at asset renewal, environmental, safety and security requirements, and reliability and quality of supply, and
- 17.7 per cent will be directed at general expenditures including information systems, property purchases, communication equipment, motor vehicles and heavy plant.

Category ($M 2008-09)	2006-07	Average 2009-10 to 2013-14	Explanation of Significant Variations
System Assets			
Asset renewal/replacement	100	163	New specific asset renewal programs for zone substations & transformers, 30 year customer services replacement program, air break switch and dropout fuse replacement program
Growth	184	286	Subtransmission lines and easements to cater for network growth
Reliability and quality of service enhancement	65	182	Compliance with reliability licence conditions, quality of supply program
Environmental, safety, statutory obligations	12	41	Fencing of zone substations, under frequency load shedding program, power factor improvement program, river crossings compliance program
Total System Capital Expenditure	**361**	**671**	
Non-System Assets			
Information technology	28	53	Customer information system, asset management system, quality of supply monitoring, cost escalators
Furniture, fittings, plant & equipment	18	10	No significant change
Motor vehicles	39	54	Change in heavy fleet replacement policy, cost escalators
Land and buildings	14	21	Property requirements for increased employee numbers, cost escalators
Other non system assets	3	5	No significant change
Total Non-System Capital Expenditure	102	143	
Total Capital Expenditure	**463**	**815**	

Table 5.17: Explanation of significant changes

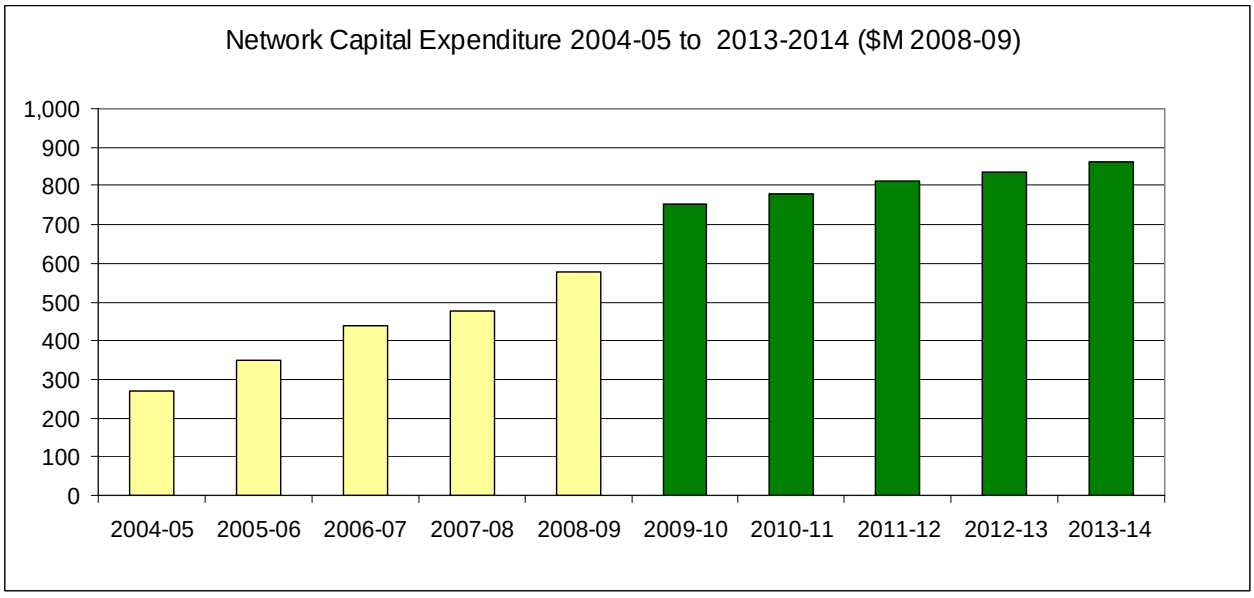

Figure 5.10: Network Capital Expenditure 2004-05 to 2013-14

The figure below illustrates the forecast geographical pattern of capital expenditure over the *next regulatory control period.*

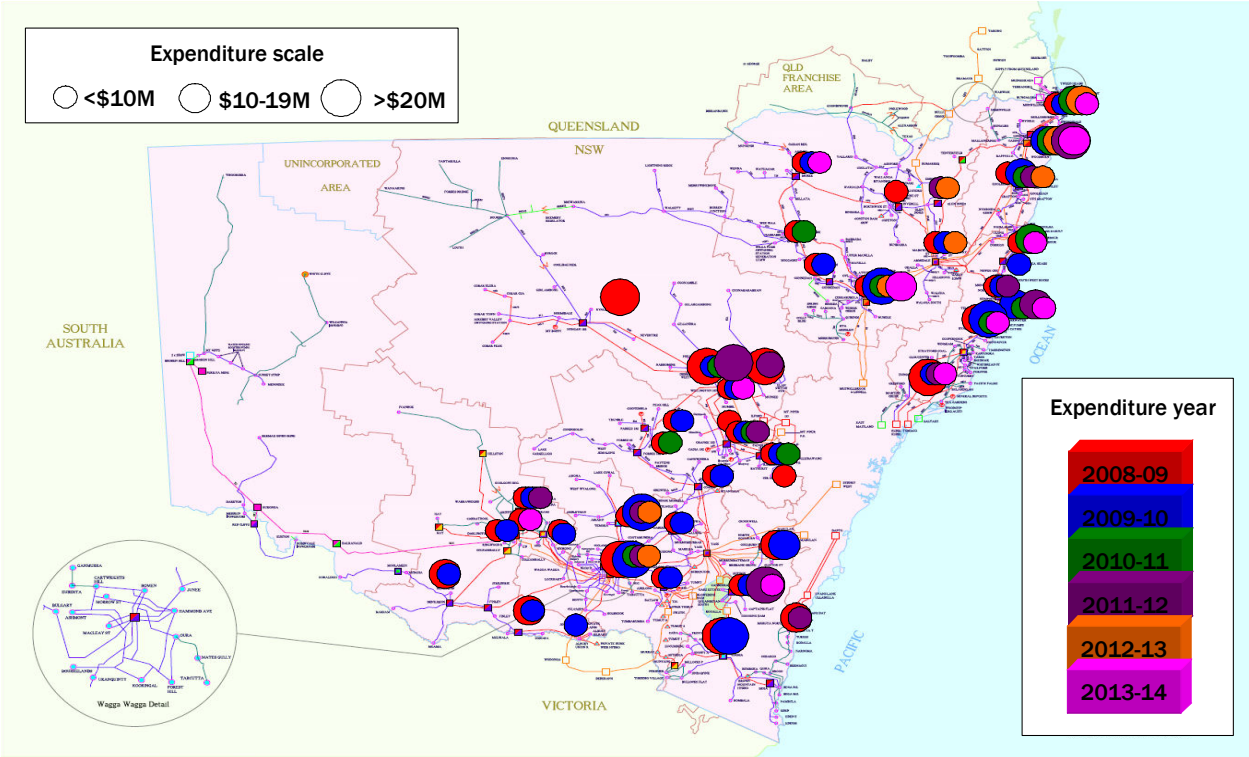

Figure 5.11: Country Energy's key forecast augmentations

5.13 Concluding comments

Country Energy is facing the twin challenges of ageing infrastructure, and expected improvements to security and reliability arising from its *licence conditions*. Further, continued strong demand growth can be expected to result in higher capital costs in the *next regulatory control period.*

The ability of Country Energy to meet its customers' requirements most efficiently is dependent on an appropriate balance between capital expenditure, operating expenditure and demand management over the *next regulatory control period.* Accordingly, the forecast operating and maintenance expenditure requirements detailed in Section 4 and the capital expenditure requirements identified in this section are closely linked. Country Energy endorses an approach where capital and operating and maintenance expenditure are assessed together.

Country Energy believes that it has provided sound substantiation of the projected capital expenditure forecasts for the *next regulatory control period*, and that these forecasts represent best estimates, arrived at on a reasonable basis based on detailed and rigorous modelling and analysis.

Depreciation

6 Depreciation

6.1 Overview

This section of the *regulatory proposal* provides Country Energy's views on regulatory and tax depreciation allowances. Regulatory depreciation represents an important source of funding for new investments. To the extent possible, regulatory depreciation should be determined on an economic basis to permit the distributors to have their capital returned at a rate that generally keeps pace with the decline in the economic value of their assets. Country Energy believes a simple straight line depreciation method provides a close approximation to the rate of economic depreciation and should be adopted.

The remainder of this section is structured as follows:

- Section 6.2 summarises the key provisions of the *Rules* relating to depreciation allowances
- Section 6.3 provides details on the regulatory depreciation to be applied to the roll forward of the RAB over the *current regulatory control period*, and
- Section 6.4 calculates the forecast regulatory depreciation for inclusion in the cost building blocks for the *next regulatory control period*, applying the straight line methodology.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

6.2 *National Electricity Rules* requirements

The transitional *Rules* are not prescriptive as to how regulatory depreciation is to be determined, although some general guidance is provided. Clause 6.4.3 of the transitional *Rules* provides that the annual revenue requirement for a distributor must be determined using a building blocks approach, which includes a component for depreciation calculated in accordance with clause 6.5.5.

Clause 6.5.5 requires that depreciation must be calculated based on the value of the regulatory asset base (RAB) at the beginning of each year, using depreciation schedules nominated by the distributor. Clause 6.5.5(b) requires that depreciation schedules must be based on the economic life of the assets and the recovery of depreciation must maintain net present value neutrality over the life of the asset.

Clause S6.1.3 requires the depreciation schedules nominated by the distributor to be categorised by asset class or category driver, and detail the amounts, values and other inputs used to compile the depreciation schedules, and a demonstration that the depreciation schedules conform with the requirements set out in clause 6.5.5(b) of the transitional *Rules*. Depreciation schedule are available as part of the Post Tax Revenue Model (PTRM).

6.3 Actual regulatory depreciation for *current regulatory control period*

The RAB roll forward methodology requires regulatory depreciation to be recalculated on the actual capital expenditure incurred or forecast capital expenditure over the *current regulatory control period*. In accordance with the transitional *Rules*, the actual depreciation must be calculated in accordance with the rates and methods allowed in the *distribution determination* for that period.

Table 6.1 below shows the recalculated regulatory depreciation for the *current regulatory control period* compared to the allowances provided in the *IPART determination*.

$M (nominal)	2004-05	2005-06	2006-07	2007-08	2008-09
Allowed Depreciation	141	148	155	162	168
Actual Depreciation	135	157	173	198	226

Table 6.1: Regulatory Depreciation for the *current regulatory control period*

6.4 Forecast regulatory depreciation for the n*ext regulatory control period*

The regulatory depreciation amount to be included in the total revenue requirement depends on the value of the RAB and the rate at which capital is returned to the distributor during the *regulatory control period*. The depreciation rate is dependent on the specific depreciation methodology adopted, the selection of the anticipated effective economic lives of the assets, and the remaining lives of the assets.

6.4.1 Depreciation methodology

Country Energy's preference is to maintain the application of the straight line approach for determining the forecast regulatory depreciation for the reasons provided below:

- It allocates an equal amount of depreciation for each year of the useful life of the assets and provides an acceptable return of invested capital
- Resulting depreciation provides a good approximation of the decline in the service potential and economic value of the asset
- Provides for smoother prices
- Administratively simple and more readily understood by stakeholders
- It is not information intensive
- Open and transparent, and is less prone to subjectivity
- Easily capable of being replicated on an ongoing basis
- Consistent with past *IPART determinations* and has wide application across all jurisdictions, and
- Consistent with the requirements of the transitional *Rules*.

Country Energy currently utilises straight line depreciation for financial accounting purposes. There appears to be little reason to move away from the application of the straight line approach at this point in time.

6.4.2 *Effective asset lives*

A key factor in the use of the straight line approach is the selection of appropriate effective working lives of the assets. If appropriate asset lives are adopted, the straight line methodology provides appropriate signalling of economic costs in terms of consumption of the resource potential of regulated assets by customers.

Country Energy has calculated regulatory depreciation consistent with the depreciation profiles used in the *IPART determination* including the average effective lives adopted by IPART at a broad asset class level.

Non system assets have significantly shorter effective lives than system assets due to the higher degree of obsolescence and the shorter lifecycle of electronic equipment, computer hardware, software and motor vehicles and plant. Accordingly, there is proportionally higher annual depreciation of these assets.

The average effective lives of the broad asset classes are listed below in Table 6.2 below.

Asset Category	Average Effective Life
Sub-transmission lines and cables	55
Distribution lines and cables	54
Substations	40
Distribution transformers	46
Low voltage lines and cables	51
Customer metering and load control	26
Communications	7
Land and easements	-
Other system assets	18
Information Technology	5
Furniture, fittings, plant and equipment	13
Motor vehicles	8
Land and buildings	50
Other non-system assets	15

Table 6.2: Effective lives by asset class

The derivation of depreciation at a more aggregated level, using a gross weighted average age profile, provides an equally accurate but simplified assessment. The weighted average effective life of Country Energy's system assets is estimated at 44 years, and for non system assets, the weighted average effective life is estimated at 9 years.

6.4.3 *Changes to effective asset lives*

There are a number of considerations that impact on the determination of an appropriate life over which to depreciate an asset. Asset lives should reflect practical experience, modern maintenance techniques, and opinion within the Australian electricity supply industry.

Changes might result in longer asset lives than previously expected due to the implementation of improved maintenance practices or might result in reductions where new technology or improved safety standards mandate earlier replacement than previously envisaged. Further the same asset might experience different lives under different climatic conditions. For example, wood poles tend to have shorter lives when subjected to wet conditions than in dry conditions.

The issue of effective asset lives for the various classes of assets that comprise the RAB has been considered by Country Energy in line with current technical information regarding physical lives. While a mix of life extension technologies is applied by Country Energy to our pole population, and an extension of the effective lives could be considered, there is much uncertainty in this regard. Country Energy has not proposed any change to those listed in Table 6.2 above.

6.4.4 Remaining lives

Country Energy has calculated remaining lives for each broad asset class, consistent with the approach used in the *IPART determination*. The average remaining lives of the various asset classes are listed below in Table 6.3. The average remaining lives are considered to be an accurate reflection of actual average ages and considered to be reliable for the purposes of determining regulatory depreciation.

Asset Category	Average Remaining Life
Sub-transmission lines and cables	27
Distribution lines and cables	27
Substations	17
Distribution transformers	22
Low voltage lines and cables	26
Customer metering and load control	9
Communications	5
Land and easements	-
Other system assets	12
Information Technology	5
Furniture, fittings, plant and equipment	10
Motor vehicles	6
Land and buildings	48
Other non-system assets	9

Table 6.3: Average remaining lives of various asset class

As mentioned above, the establishment of depreciation at a more aggregated level, using a gross weighted average age profile provides an equally accurate and simple assessment. The weighted average remaining life of system assets is estimated at 25 years and for non system assets, the weighted average remaining life is estimated at 8 years.

A minimum residual life should be applied where the average service life for an individual asset class is greater than the average effective life. This recognises the continuing value of individual assets that have survived beyond the standard effective asset life and allows an *RNSP* to continue to earn revenue from these assets. The *IPART determination* constrained minimum remaining lives to five years. The application of any other approach would result in Country Energy under recovering its actual depreciation.

6.4.5 *Forecast regulatory depreciation for the next regulatory control period*

From the starting asset values and asset lives at July 2009, Country Energy has calculated the regulatory depreciation for each year of the *next regulatory control period,* as illustrated in Table 6.4 below.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Forecast Regulatory Depreciation	218	263	306	316	329

Table 6.4: Forecast regulatory depreciation

6.4.6 *Forecast tax depreciation for the next regulatory control period*

In order to move from IPART's pre tax framework to the *AER*'s post tax framework, it is necessary for Country Energy to calculate depreciation for the *next regulatory control period*. The PTRM provides more information on tax depreciation schedules.

For the purpose of estimating the cost of corporate income tax, Country Energy has calculated tax depreciation in accordance with tax law on a straight line basis. Table 6.5 shows the forecast tax depreciation schedule for the *next regulatory control period*.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Forecast Tax Depreciation	151	188	222	242	276

Table 6.5: Forecast tax depreciation

Value of the Regulatory Asset Base

7 Value of the Regulatory Asset Base

7.1 Overview

This section details the calculation of Country Energy's RAB in accordance with the *Rules* and the *AER*'s roll forward model. The RAB comprises the system and non system assets that are used in the provision of *standard control services*. The value of the RAB is a key component of the cost building block methodology, as it represents the value of the investment upon which Country Energy earns a return on capital and return of capital (regulatory depreciation) over the economic life of the assets.

The remainder of this section is structured as follows:

- Section 7.2 summarises the key provisions of the *Rules* relating to establishing the value of the RAB and the roll forward of the RAB
- Section 7.3 details the establishment of the RAB value at 1 July 2004 and the roll forward of this value to the end of the *current regulatory control period* at 30 June 2009
- Section 7.4 describes the roll forward of the RAB for the *next regulatory control period* from 1 July 2009 to 30 June 2014, and
- Section 7.5 provides concluding comments.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

7.2 *National Electricity Rules* requirements

Clause 6.5.1 of the transitional *Rules* provides general guidance and requirements for the valuation of regulated assets for electricity distribution networks, and describes the required contents of a roll forward model of the RAB that the *AER* must develop and publish. The *AER* may, from time to time, amend or replace the roll forward model.

Clause S6.2 sets out other provisions relating to the RAB. Clause S6.2.1 establishes an opening value of the RAB by reference to the asset values used by the jurisdictional regulator (IPART) in the *current regulatory control period* and sets out the method for rolling forward the RAB between *regulatory periods*. Clause S6.2.1(e) describes the method of adjustment to the value of the RAB.

More specifically clause S6.2.1(e)(8) provides that the previous value of the RAB may be increased by the inclusion of past capital expenditure that has not been included in that value, but only to the extent that such past capital expenditure meets a number of conditions. Clause S6.2.1(f) provides that any increase or reduction in the value of the RAB is to be based on the value of the relevant asset as shown in independently audited and published accounts.

Clause S6.2.3 describes how the RAB is rolled forward each year within the same *regulatory control period*.

7.3 Roll forward of the RAB from 1 July 2004 to 30 June 2009

Country Energy has calculated a closing value of the RAB as at 30 June 2009 in accordance with the *Rules* and the roll forward model published by the *AER*.

7.3.1 Establishing the opening RAB value at 1 July 2004

IPART determined the value of the RAB at the commencement of the *current regulatory control period* on 1 July 2004. This value of $2,440 million has been listed in clause S6.2.1(c)(1) of the *Rules* as the opening value of the RAB to be used for Country Energy. The value has to be then adjusted by the difference between the actual capital expenditure and the estimated capital expenditure for the financial year ended 30 June 2004 in accordance clause S6.2.1(c)(2).

The *AER*'s roll forward model calculates this difference and applies it to the closing RAB value at 30 June 2009.

7.3.2 Roll forward methodology

Clause S6.2.1(e) describes the method of adjusting the RAB to obtain the opening value as at 1 July 2009. The opening value of the RAB at 1 July 2004 is adjusted as follows:

- Increased by the amount of all capital expenditure incurred during the *current regulatory control period*
- Increased by the amount of the estimated capital expenditure approved by the *AER* for any part of the *current regulatory control period* for which actual capital expenditure is not available
- The RAB must only be increased by actual or estimated capital expenditure to the extent that all such capital expenditure is used in the provision of *standard control services*
- Reduced by the amount of actual depreciation of the RAB during the *current regulatory control period*, calculated in accordance with the rates and methods allowed in the *distribution determination* for that period
- Reduced by the disposal value of any asset where that asset has been disposed of during the *current regulatory control period,* and
- Reduced by the value of an asset that is no longer used for the provision of *standard control services*.

Clause S6.2.1(e)(8) provides for adjustments to be made to the RAB for the inclusion of the value of some assets. This matter is discussed in detail in Section 9.8.2.

Clause S6.2.1(g) also requires the RAB for Country Energy for the *current regulatory control period* to reflect the deferred depreciation allowed by the *IPART determination*.

7.3.3 Adjustment for capital expenditure

The RAB must be increased to recognise all capital expenditure incurred for system and non system assets used in the provision of *standard control services*. It should be noted that the value of customer contributions has been excluded from the roll forward of the RAB, reflecting the fact that distributors do not finance this share of capital expenditure.

Country Energy has obtained figures for incurred capital expenditure and customer contributions from its audited regulatory accounts to 30 June 2007. Country Energy has used estimates for the final two years of the *current regulatory control period*. For the 2008 financial year, Country Energy has used the actual capital expenditure to 29 February 2008 and the forecast for the remainder of the year. The basis for the 2009 financial year is the 2008-09 budget figures.

7.3.4 *Adjustment for actual depreciation*

Clause S6.2.1(e)(5) requires the RAB to be reduced by the amount of actual depreciation of the RAB during the *current regulatory control period*, calculated in accordance with the rates and methods allowed in the *distribution determination* for that period. Country Energy has recalculated the depreciation allowance based on the actual and forecast capital expenditure incurred during the *current regulatory control period* for use in the roll forward model, as detailed in Section 6.

7.3.5 *Adjustment for deferred depreciation*

The transitional *Rules* also require the *AER* to adjust Country Energy's RAB to account for the amounts of deferred depreciation allowed by the *IPART determination*. Accordingly, deferred depreciation from the *IPART determination* has been reinstated through an upward adjustment in the RAB roll forward.

7.3.6 *Other assumptions associated with the RAB roll forward*

Country Energy has made a number of assumptions associated with establishing the RAB value for the *current regulatory control period*.

- *Asset disposals* – Disposals represent asset scrapping before the asset is fully depreciated. Asset disposals are mainly attributed to non system assets such as the disposal of plant and equipment, buildings and vehicles. The written down value of the assets disposed is taken from the Country Energy regulatory accounts for each year. Assets disposed of have been recognised in the year of disposal.

- *Adjustment for Inflation* – The purpose of indexing asset values with inflation is to preserve the real value of the asset owner's investment, thereby minimising inflation risk to the asset owner. The inflation included in the *IPART determination* reflected an estimate. Accordingly, it is necessary to adjust the value of the RAB for actual outturn inflation to provide an allowance for the change in the purchasing power of money during the *current regulatory control period*.

  Country Energy has applied the All Groups CPI - Average of the Eight State Capital Cities (published by the Australian Bureau of Statistics) for each year of the *current regulatory control period* to 30 June 2009, consistent with annual network pricing adjustments.

- *Stranded assets* – Country Energy has not identified or removed stranded or partly stranded assets from the RAB.

- *Non system assets* – The basis of the roll forward of non system assets is the accounting (written down) book value as per the fixed asset register. This is considered by Country Energy to be an appropriate regulatory practice and is reported in the audited regulatory accounts. Valuations for substation and other lands relating to system assets have not been included in this asset category.

- *Assumptions for the 2008 and 2009 financial years* – As at the time of preparing this *regulatory proposal*, actual data for the 2008 and 2009 financial years are not available for capital expenditure, depreciation and asset disposals. Country Energy has therefore used budgeted figures for capital expenditure (and recalculated depreciation on this) and asset disposals. The values would need to be adjusted for the difference between the actual and forecast figures when actual data becomes available.

7.3.7 *Roll Forward of the RAB from 1 July 2004 to 30 June 2009*

The roll forward calculation over the *current regulatory control period* from 1 July 2004 to 30 June 2009 is depicted in Table 7.1 below. The table presents the aggregation of capital expenditure, regulatory depreciation, and disposals for all asset classes. The closing RAB at 30 June 2009 for Country Energy is $4,236 million.

$M (nominal)	2004-05	2005-06	2006-07	2007-08	2008-09
Opening RAB	2,439	2,649	2,921	3,297	3,741
Plus all capital expenditure	284	363	458	499	602
Plus deferred depreciation	-	10	21	33	48
Less actual depreciation	135	157	173	198	226
Less asset disposals	7	7	7	7	7
Plus indexation	68	62	78	117	87
Less difference between actual and forecast capex	-	-	-	-	10
Closing RAB	2,649	2,921	3,297	3,741	4,236

Table 7.1: Roll forward of the RAB to 30 June 2009

7.4 Roll Forward of the RAB from 1 July 2009 to 30 June 2014

Country Energy has modelled the roll forward of the RAB for the *next regulatory control period* based on the closing RAB value as at 30 June 2009 detailed in Section 7.3 above.

Clause S6.2.1 of the transitional *Rules* describes how the RAB is rolled forward each year within the *next regulatory control period*. It requires that the RAB at the beginning of a subsequent year is calculated by adjusting the RAB at the start of the preceding year as follows:

- Increased by the amount of forecast capital expenditure accepted or substituted by the *AER* for the previous year
- Reduced by the amount of depreciation included in the distributor's annual revenue requirement for the previous year
- Reduced by the forecast disposal value for the previous year
- Adjusted by inflation.

Country Energy has rolled forward the value of RAB from July 2009 to June 2014 in accordance with the transitional *Rules* and the *AER*'s roll forward model.

7.4.1 *Assumptions Associated with the RAB Roll Forward*

Country Energy has made a number of assumptions associated with RAB roll forward.

- *Capital expenditure*

  Country Energy's roll forward of the RAB is based on the use of the forecast capital expenditure as detailed in Section 5 of this *regulatory proposal*. Country Energy has included forecast capital expenditure at the time it is projected to occur.

- *Regulatory depreciation*

  Forecast regulatory depreciation is detailed in Section 6 of this *regulatory proposal*. Depreciation has been calculated on a straight line basis adopting the depreciation schedules contained in the *IPART determination*, including asset lives, remaining lives, and the depreciated asset values for each of the asset classes in the RAB.

- *Asset disposals*

  Forecast asset disposals have been incorporated as shown in Table 7.2 below.

- *Inflation*

  An inflation rate of 2.54 per cent has been assumed in the forecast roll forward consistent with the analysis in CEG's report as Appendix H.

7.4.2 Roll Forward of the RAB to 30 June 2014

The projected RAB (and the components thereof) at the end of each year over the *next regulatory control period* is summarised in Table 7.2 below.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Opening RAB	4,236	4,914	5,613	6,344	7,135
Plus all capital expenditure	798	847	904	955	1,010
Less actual depreciation	218	263	306	316	329
Less asset disposals	9	9	9	9	10
Plus indexation	108	125	143	161	181
Closing RAB	4,914	5,613	6,344	7,135	7,988

Table 7.2: Roll forward of the RAB from 1 July 2009 to 30 June 2014

7.5 Concluding comments

As part of the upcoming *AER* review process, the value for the RAB will need to be updated from the start of the *current regulatory control period* to 30 June 2009 using actual data and forecasts where available, and then projected forward over the *next regulatory control period.*

The opening value for the RAB as at 1 July 2009 using the standard roll forward approach is $4,236 million. Country Energy has modelled the roll forward of the RAB for the *next regulatory control period* accordingly.

However, the accurate valuation of the RAB is a critical step in determining the revenue stream necessary to support the distribution business and is critical for the incentives it provides for future investment. A number of material inaccuracies exist in the initial 1999 asset valuation, which has perpetuated through into subsequent roll forward valuations. Country Energy firmly believes that the opening RAB at 1 July 2009 must be confirmed as robust and accurate and omitted assets must be corrected, before the standard roll forward can be applied. This is further detailed in Section 9.8.2.

Weighted Average Cost of Capital

8 Weighted Average Cost of Capital

8.1 Overview

This section sets out the regulated rate of return that Country Energy requires on efficient capital investment. The importance of providing a stable return on investment has been recognised in formulating the cost of capital and taxation aspects of the transitional *Rules*. In particular, the transitional *Rules* provide greater certainty regarding the methodology and parameters that should be applied.

The remainder of this section is structured as follows:

- Section 8.2 summarises the key provisions of the *Rules* relating to establishing the value of the weighted average cost of capital (WACC)
- Section 8.3 details the establishment of the WACC which will be used to determine the return on capital component of this *regulatory proposal*, and
- Section 8.4 details the establishment of the tax allowance calculated for inclusion in this *regulatory proposal*.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

8.2 *National Electricity Rules* requirement

Clause 6.4.3 of the transitional *Rules* provides that the annual revenue requirement for a distributor must be determined using a building blocks approach, which includes a component for the return of capital is calculated in accordance with clause 6.5.2.

Clause 6.5.2 requires that the return on capital must be calculated by applying rate of return to the value of RAB at the beginning of each year. Clause 6.5.2(b) requires that the rate of return must be calculated as a nominal post tax WACC in accordance with the formula provided.

Clause 6.5.3 requires the calculation of the estimated cost of corporate income tax component used in the building block.

8.3 Weighted Average Cost of Capital

Clause 6.5.2(b) sets out that the post tax WACC is to be estimated in accordance with the following formula:

$WACC = \mathbf{k}_e \, E/V + \mathbf{k}_d \, D/V$

where:

- ke is the nominal return on equity (determined using the Capital Asset Pricing Model) and is calculated as:

  $r_f + \beta e \times MRP$ where:

  - r_f is the nominal risk free rate for the *regulatory control period*
  - βe is the equity beta deemed to be 1.0, and
  - MRP is the market risk premium deemed to be 6.0 per cent
- kd is the nominal return on debt and is calculated as:

  r_f + DRP where:

  - DRP is the debt risk premium for the *regulatory control period*
- E/V is the equity share in total value, which is 1-D/V, and
- D/V is the debt share in total value, deemed to be 0.6.

To calculate the WACC, Country Energy is required to estimate the following parameters:

- nominal risk free rate, and
- debt risk premium.

8.3.1 Nominal Risk Free Rate

In accordance with clause 6.5.2(c), the nominal risk free rate is defined as the rate determined by the *AER* on a moving average basis from the annualised yield on Commonwealth Government bonds with a maturity of 10 years using the indicative mid rates published by the Reserve Bank of Australia. Country Energy understands this will be decided by the *AER* in their final *determination*. For simplicity and guidance, Country Energy has adopted the nominal risk free rate nominated in the *AER's* SP AusNet *determination* of 6.09 per cent.

Under S6.1.3(8) of the transitional *Rules* a building block proposal must contain a proposal for the commencement and length of the period nominated by the *RNSP* for the purposes of clause 6.5.2(c)(2) of the *Rules* (ie, the specific period for observing the nominal risk free rate). For greater certainty earlier in the regulatory process, Country Energy proposes to adopt CEG's recommendation on the proposed averaging period for the nominal risk free rate and debt risk premium and the start of the averaging period (refer to Appendix I).

8.3.2 Debt Risk Premium

In accordance with clause 6.5.2(e), the debt risk premium is the premium determined by the *AER* as the margin between 10 year Commonwealth annualised bond rate and the observed annualised Australian benchmark corporate bond rate for the corporate bonds which have a maturity of 10 years and a credit rating of BBB+ from Standard and Poors.

Country Energy recognises that given the volatility occurring in debt markets in recent times, it would be prudent to adopt the most recently available approved debt risk premiums to ensure up to date representation of this volatility. As such Country Energy proposes to adopt the debt risk premium rate nominated in the *AER's* SP AusNet *determination* of 2.11 per cent.

8.3.3 *Inflation Forecast*

When applying the Capital Asset Pricing Model, regulators estimate the real (inflation adjusted) return required by investors on a riskless asset. The standard procedure for doing this has, in the past, been to adopt the observed yield on inflation adjusted bonds issued by the Australian Commonwealth Government. However, in recent years there is evidence that these bonds' yields tend to be biased downwards. This may be explained by falling supply of these bonds – leading to investors paying a scarcity premium for them. This has led to the need to estimate the real risk free rate by deducting a forecast of 10 year inflation from the observed yield on nominal bonds issued by the Australian Commonwealth Government.

Country Energy engaged CEG to advise on the best approach to calculating the real expected yield on a nominal Commonwealth Government Security with a maturity of 10 years. In the report (refer to Appendix H), CEG surveyed expert opinions on the expected rate of inflation over the next 10 years. The relevant estimate is the weighted average mean of forecasters' short and long term expectations (2.54 per cent). This estimate is not materially different to the median forecast or to the mean forecast. CEG notes that selecting an estimate of 2.54 per cent for expected inflation is also consistent with the written advice of both the RBA and the Commonwealth Treasury (refer to Appendix I). Therefore, Country Energy has adopted CEG's recommendation and assumes an inflation of 2.54 per cent.

8.3.4 *Summary*

Based on the above, Country Energy has calculated a post tax WACC of 9.76 per cent in accordance with the requirements of the *Rules*.

The table below provides a summary of the parameter values that have been adopted in our calculation of WACC and resulting WACC estimates.

Parameter	Recommended value (per cent)
Nominal risk free rate	6.09
Inflation rate	2.54
Debt risk premium	2.11
Equity beta	1.0
Market risk premium	6.0
Equity proportion	40
Debt proportion	60
Post-tax nominal vanilla WACC	**9.76**

Table 8.3: Pre-tax Real WACC Parameter Estimates

8.4 Cost of tax

As part of the post tax nominal approach, a separate allowance must be made in the revenue cap for corporate income tax, net of the value ascribed to dividend imputation credits. Clause 6.5.3 sets out that the estimated cost of corporate income tax must be calculated in accordance with the following formula:

$ETC_t = (ETI_t \times r_t)(1 - \gamma)$

where:

- ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of *standard control services* if such an entity, rather than the *RNSP*, operated the business of the *RNSP*, such estimate being determined in accordance with the post-tax revenue model
- r_t is the expected statutory income tax rate for that regulatory year as determined by the *AER*, and
- γ is the assumed utilisation of imputation credits, deemed to be 0.5.

The value of Country Energy's customer funded capital expenditure is included in the opening tax asset base and in each period of the *regulatory period*, Customer funded capital expenditure is included as part of the total forecast capital expenditure. This ensures that the calculation of the tax building block includes both tax depreciation and tax expense relating to the costs and revenue associated with customer funded work. However, capital contributions are excluded from the RAB.

Country Energy has calculated the net tax allowance for the *next regulatory control period* and it is summarised in Table 8.4 below. Country Energy has calculated this tax allowance using the *AER*'s PTRM and the tax depreciation allowances discussed in Section 6.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Tax payable	82	91	101	106	107
Less value of imputation credits	(41)	(46)	(51)	(53)	(53)
Net tax allowance	**41**	**46**	**51**	**53**	**53**

Table 8.4 Tax allowance

Other Economic Regulatory Arrangements

9 Other Economic Regulatory Arrangements

9.1 Overview

This section provides Country Energy's views on a range of economic regulatory arrangements that are required to be addressed under the transitional *Rules* that have not been covered elsewhere in this *regulatory proposal*. These issues include pass through arrangements, demand management incentives, the efficiency benefit sharing scheme (EBSS), service target performance incentive scheme (STPIS), miscellaneous and monopoly services and transitional issues.

The remainder of this section is structured as follows:

- Section 9.2 summarises the key provisions of the *Rules* relating to economic regulatory arrangements for the issues addressed in this section
- Section 9.3 details Country Energy's proposed pass through framework including nominated events and materiality thresholds
- Section 9.4 discusses the framework for demand management incentives and schemes
- Section 9.5 provides suggestions for events to be excluded from the EBSS
- Section 9.6 discusses the *AER's* STPIS proposed for the *next regulatory control period*
- Section 9.7 presents Country Energy's position in relation to methodology and charges for miscellaneous and monopoly services, and
- Section 9.8 discusses transitional issues.

It should be noted that the information and data provided in this section relates to the provision of *standard control services* only. Information and data for *alternate control services* can be found in Section 11.

9.2 *National Electricity Rules* requirements

Clauses 6.6.1 of the transitional *Rules* discusses pass through arrangements and defines four pass through events being a regulatory change event, a service standard event, a tax change event and a terrorism event. In addition to these four events, the transitional *Rules* allow the distributor to nominate events which it believes should be classified for the *distribution determination* as pass through events.

In accordance with clauses 6.6.3 of the transitional *Rules*, the *AER* developed and published an incentive scheme or schemes (demand management incentive scheme) to provide incentives for *RNSP* to implement efficient non network alternatives or to manage the expected demand for *standard control services* in some other way. The *AER*'s demand management incentive schemes, set out the *AER*'s decisions on the way in which the demand management incentive schemes will operate for the *next regulatory control period*.

In accordance with clauses 6.5.8 of the transitional *Rules* the *AER* has developed and published an EBSS that provides for a sharing of operating expenditure efficiency gains and losses between *RNSP*s and distribution network users. Under these *Rules*, the *AER* has released a paper on their *AER*'s approach to providing incentives for a R*NSP* to improve the efficiency of its operating expenditure and share any resulting efficiency gains or losses with distribution network users for the *next regulatory control period*.

The guideline on control mechanisms for direct control services has been developed by the *AER* under clause 6.2.8(a)(2). The control mechanisms for direct control services, including miscellaneous and monopoly services, must comply with the relevant requirements prescribed in the *Rules* under clauses 6.2.5 and 6.2.6 of the transitional *Rules*. Under clauses 6.2.4 and 6.2.5 of the transitional *Rules*, the *AER* is to make a *distribution determination* for each *RNSP*, controlling the prices, or revenue, or both of direct control services. The control mechanism is the means by which the *AER* will impose controls over the prices and/or revenues of direct control services. The *AER* has released the guideline to ensure that the *AER* and *RNSP*s have a common understanding of how the forms of control for direct control services will be applied in the 2009 *determinations*.

The STPIS has been developed and published by the *AER* under clause 6.6.2 to maintain and improve performance. The *AER* has released the guideline on STPIS to provide guidance about *AER*'s approach to the scheme.

9.3 Pass through arrangements

Pass through costs and distribution prices are intrinsically linked, and as such, are an important component to be addressed. In principle, cost pass through should apply to those costs that are beyond the distributor's control and influence. There is likely to be a range of costs that will impact Country Energy over the course of the *next regulatory control period* that cannot be included in the foreseeable regulated operating or capital expenditure forecasts.

Country Energy notes that at the time of preparing this *regulatory proposal*, the *AER* is yet to release a guideline on the materiality threshold for pass through events. Country Energy submits that regardless of the final threshold used by the *AER* in its *distribution determination*, it should be limited to the defined events contained in the transitional *Rules*.

Country Energy submits that for all pass though events nominated in a *distribution determination*, there should be no materiality threshold, but rather a predetermined trigger. This reflects the fact that the nominated events are foreseen as a possibility but their timing is uncertain. At this point in time it would be also extremely difficult to quantify the exact resulting changes and cost implications of the event.

IPART implemented this approach for the *current regulatory control period*. While they stated it would be inappropriate to include costs for which reasonableness and timing were uncertain in the building blocks, IPART also declared '*given that the costs were foreseen..... considers it inappropriate for these costs to be subject to a materiality threshold*'[2].

In nominating pass through events below, Country Energy has adopted the proposed approach described above in arriving at the list of events. Country Energy believes this is a fair and balanced approach for all stakeholders and eliminates the undesirable alternative of submitting estimates for inclusion in the cost building blocks for events that are uncertain in both timing and scope.

[2] IPART, *NSW Electricity Distribution Pricing 2004/05 to 2008/09 Final Report*, June 2004, Other Paper No 23, p127.

9.3.1 *Nominated pass through events*

Apart from the defined events listed in the transitional *Rules*, Country Energy seeks the inclusion of the following events as nominated pass through events for the *distribution determination*:

- New or additional market requirements (such as the mandatory rollout of interval meters and the consequent significant data handling costs)
- 'Intelligent network' investments
- Self insurance events
- Changes in risk assessment costs due to legal outcomes
- Changes to obligations, structure and costs due to outcomes of the Retail Reform Project, and
- Input cost variations.

While Country Energy accepts that the distributor may be able to manage some of the risks, non controllable risks are best borne by users of the network and not distributors. The building block proposal is derived from estimates of the future operating and capital expenditure of the business. Some costs are not included in these estimates due to the uncertainty of whether and when the costs may be incurred, and the potential magnitude of the cost. As the X factors are fixed for the length of the *regulatory period*, Country Energy would bear the financial risk associated with these events should they occur. The costs associated with unforeseen events may significantly impact on returns (both positive and negative) to the business.

In the absence of other provisions to recover material unforeseen costs, the potential exists for the distributor's costs to increase (or decrease) above (or below) those levels assumed in the calculation of the smoothed revenue requirements, impacting on regulated returns. Country Energy proposes that the events above be defined as pass through events in the *AER*'s *distribution determination*. Should any of the above events occur Country Energy proposes that application will be sought from *AER* as per clause 6.6.1 of the transitional *Rules*.

Several of these proposed nominated pass through events are discussed below:

- *Rollout of advanced metering infrastructure (AMI)*

  The Ministerial Council on Energy (MCE) has released its 'phase two' cost benefit analysis of a national smart metering rollout. The analysis recommends that a full range of functionality compatible with an 'intelligent network' be mandated (including compatibility with 'home area networks') and that distributors be responsible for the rollout.

  The MCE paper predicts a positive national economic net benefit in the range of $180 million to $4,000 million (Net Present Value over 20 years), but the validity of the costs and benefits estimation is yet to be closely reviewed. Accordingly, Country Energy proposes that any mandated smart metering rollout within our network area be specified as a pass through event. A mandated smart meter rollout may have broader impacts on Country Energy aside from the substantial costs that would be involved, for example in the areas of pricing strategy, demand management and consumption profiles. Country Energy believes it is important that the pass through event for a mandated smart meter rollout is able to cater for all impacts and changes to a distributor's *regulatory proposal* parameters.

  According to the *Rules*, an *RNSP* has 90 days from the time the pass through event occurs to prepare a pass through submission for approval by the *AER*. Country Energy is of the view that the trigger for the mandated smart meter rollout occurring should be defined in this *distribution determination* as the time when the distributor has been able to firm up all costs, benefits and impacts to the point where a full business case can be presented to the *AER*.

- *Intelligent Network*

  An 'intelligent network' is expected to consist of five major components:

  - grid equipment and sensors
  - communications infrastructure
  - information technology infrastructure
  - information systems, and
  - analytics.

  Some typical expected characteristics of operating in an intelligent network environment include:

  - more automation in monitoring and control of the power usage and the electricity network
  - greater integration of the network to create an end to end system from the utility to the home, and from the home back to the utility
  - greater responsiveness to changing market conditions – both for the utility and the customer, and
  - greater responsiveness to regulatory compliance.

  In a connected environment, detailed analytics and modelling can be performed in order to optimise asset management and operation while promoting energy efficiency by making possible the integration of distributed energy, including renewables, and smart metering.

  For Country Energy, an intelligent network involves the application of digital capacity to our existing electro-mechanic infrastructure, to provide a more reliable and efficient power network through remote diagnostics and self healing, fine tuning capacity in real time, and better network planning. An intelligent network would be designed to allow better resource utilisation, network management and demand management. Early investment in an intelligent network may defer the need for network investment in the medium to long term.

  An intelligent network will help provide a solution for our customers who want greater control over their energy usage and costs, and energy efficiencies can be 'built in' to the network, and can enable a wider penetration of small renewable generators by allowing renewable energy to be shared, and possibly stored, locally.

  Country Energy would seek to realise efficiency gains as the network is transformed, including:

  - Faster response times to unplanned supply interruptions
  - Energy efficiency through smart metering
  - Remote monitoring and control of equipment installed in the field and in central offices
  - Real-time access to operations and business data resulting in improved productivity
  - Billing efficiencies that benefit the customer and retailers
  - Greater responsiveness to changing market conditions and regulatory compliance, and
  - The capture and retention of business knowledge, that, as our workforce ages, provides new employees with knowledge-bearing tools to guide them through processes at experienced levels.

  However, these benefits will need to come in steps and the first step in an intelligent network is smart metering. Currently, any potential rollout of an intelligent network (largely driven by smart metering) may present a 'split benefits' problem – the inability of the electricity sector to implement intelligent networks without government intervention due to benefits being split between multiple electricity industry participants, consumers and longer-term market effects.

Country Energy has assessed not only smart meters but also the incremental benefits that may accrue with intelligent networks. An *RNSP* led rollout of smart meters may resolve this problem as costs may be recovered through cost pass through arrangements.

Country Energy is developing an Intelligent Network Research and Demonstration Centre in Queanbeyan, to test and display the operation of intelligent network concepts and components.

Planning is also underway for the development and implementation of Country Energy's first 'intelligent network community', which will include the deployment of smart meters in conjunction with other intelligent network components including network sensors. It is anticipated that this community will involve more than 10,000 customers, testing and demonstrating intelligent network technologies, process and concepts and including network and customer management to provide the first large scale Australian test of an integrated intelligent network.

However, cost recovery for developments such as these are not assured under current regulatory arrangements. Mechanisms available under the current *IPART determination* for NSW distribution businesses are largely limited to the D factor.

The purpose of the D factor is to provide incentives to undertake demand management. It aims to address concerns regarding rising peak loads and network asset utilisation. To date, Country Energy has made only modest claims under the current D factor scheme due to the limited compatibility between currently available technologies for non network alternatives and the specific nature of emerging network constraints. The extension of the D factor scheme into the *next regulatory control period* of 2009 to 2014 is welcomed by Country Energy, but in general it is not an effective means of cost recovery for large scale pilot programs that incorporate smart meters.

The *AER* has proposed to allow *RNSP*s another potential source of costs recovery with the introduction of the demand management innovation allowance, in the *next regulatory control period*.

The demand management innovation allowance is proposed to be $600,000 per year for Country Energy. This allowance is unlikely to cover the cost of undertaking intelligent network pilots and trials. Even if there was the ability for network businesses to accumulate this annual fund so that in year four, as an example, $2.4 million could be spent on a large trial program, the allowance is inadequate.

Accordingly, Country Energy recommends that the demand management innovation allowance be increased, and that the potential deployment of intelligent network infrastructure be recognised as a nominated pass through event.

- *Sheather case*

  The Sheather case involved the collision of a helicopter with a Country Energy spur powerline in February 1999. The spur powerline had no markers on it, nor were they required by the Australian Standards. A recent decision of the NSW Court of Appeal has found Country Energy to have breached its duty of care which it owed, despite the network operator complying with the relevant Australian Standards in relation to the powerlines.

  Country Energy's legal team has advised of two approaches open to Country Energy. The first is where Country Energy approach the government for legislative protection for liabilities arising from powerlines, where those powerlines otherwise comply with Australian and industry standards.

  The second approach is for Country Energy to modify current risk assessment processes to identify potential areas where a combination of enhanced risk factors may exist and therefore increase the risk of aircraft wire strike. These risks would be rated and ranked based upon their assessed severity. The implementation of further controls to mitigate the risk relative to those identified sections of powerline could then be considered in accordance with these ratings.

The cost implications of the two approaches are yet to be realised as the appropriate additional criteria to be incorporated into the assessment processes for those identified sections of powerline are currently being analysed in conjunction with the outcomes of two current coronial inquests.

- *Retail Reform Project*

  On 10 December 2007, the NSW Government announced it would accept Professor Tony Owen's key recommendations on electricity retail and generation. This includes Country Energy retaining its electricity distribution network assets, while retail functions would be moved to private operators.

  Country Energy has established a Retail Reform Project Team to work through issues involved in separating the retail business from the network business. The implications of the retail reform will not be known until the government decides to definitely go ahead with the sale, its structure and timing. Due to the uncertainties involved, Country Energy believes that any sale of its retail business needs to be incorporated as a nominated pass through event. Similar to the rollout of smart meters, Country Energy is of the view that the trigger for a retail reform pass through event should be at the time when the distributor has been able to firm up all costs, benefits and impacts to the point where a full business case can be presented to the *AER*.

  Country Energy has therefore prepared this *regulatory proposal* based on the current organisational structure and approved cost allocation method.

- *Network support payments*

  This cost area includes network support payments to embedded generators connected to the Country Energy network. These generators provide network support services in the form of local generation and the provision of reactive power. Future network support payments by Country Energy have not been included in the operating and maintenance expenditure forecasts to be recovered under the weighted average price cap.

- *Input cost changes*

  Country Energy agrees with the *AER* that there may be scope to nominate significant input cost variations as pass through events. Consequently, input cost changes treated as pass through events would not influence carryover amounts for the operation of the EBSS.

- *Self insurance events*

  Asbestos – Country Energy is potentially liable for claims related to the impact of asbestos, which was, or still is contained within its assets, that has, or previously had, on the health of its employees and third parties. Country Energy is required to comply with the Occupational Health and Safety regulations in relation to the safety aspects of asbestos and adopts a number of efficient and effective mitigation strategies for this risk. However, any estimate of the expected cost of asbestos related risk will be subjective. Country Energy believes that the adoption of a cost pass through mechanism for the liability component of this risk represents the most cost efficient allocation of risk.

  Climate change risks – CSIRO has identified a number of possible outcomes in relation to climate change as part of the intergovernmental panel on climate change that could potentially expose Country Energy operationally and financially. In addition to these risks, Country Energy would also face a significant financial risk if the government were to introduce an emission trading scheme that included within its scope, the emissions of electricity distribution businesses. Whilst the introduction of such a scheme is highly possible, there are no details outlined for the proposed scheme to quantify the financial cost that may be borne by Country Energy.

  Country Energy believes that it is thus appropriate for the direct (cost of emissions) and the indirect costs (systems, audit) borne by Country Energy as a result of the introduction of any emissions trading scheme to be passed on to its customers via the adoption of a specific cost pass through provision for this risk. The adoption of an emissions trading mechanism is entirely outside of

Country Energy's control, and therefore, it would be inefficient for Country energy to bear this risk going forward.

Gradual pollution – Despite having mitigation procedures for such risks, there are a number of aspects of the electricity business that could potentially expose Country Energy to the possibility of gradually polluting the surrounding environment including:

- Leakage from underground fuel tanks
- Oil leaking from transformers, and
- Contamination from treated poles.

Country Energy believes that it is appropriate for the potential liability consequences associated with gradual pollution to be mitigated via the adoption of a cost pass through mechanism.

It is difficult to accurately quantify the third party liability component of this risk as it is difficult to clearly identify the residual borne by Country Energy, as there is minimal understanding of the number of sites that may be contaminated due to the existence of treated poles or an underground storage. There is also the potential for significant legal costs to be incurred if a matter goes to court and the range in feasible payouts to third parties if liability by Country Energy is ascertained as also likely to be significantly large. This exacerbates the consequences associated with adopting an incomplete/inaccurate quantification in relation to this risk. There is unlikely to be any moral hazard in relation to the treatment of this risk via a cost pass through provision, as Country Energy will still bear the cost of any fines levied by external agencies for any breach of applicable environmental laws. Furthermore, Country Energy would also suffer the obvious impact upon their reputation if an incident were to occur. These factors will provide Country Energy with enough incentive to adopt cost effective mitigation procedures for these risks.

Electric and magnetic field claims – The inconclusive findings of the ongoing research into the issues means there is a need to fully consider the potential exposure to future EMF liability claims. It appears clear that Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) draft standard would, if implemented, have significant consequences on Country Energy's operational practices and exposures to financial consequences. Given the uncertain nature of this risk and the potential for extremely large costs to be incurred due to this risk, Country Energy believes that the most appropriate risk mitigation mechanism is to provide for this cost to be passed through to customers.

Business continuity – Business continuity risks relates to future incidents that could significantly impact on our ability to continue normal business operations either in a specific region, following a localised event, or across the entire distribution region, following a more widespread event, such as but not limited to:

- Tsunami
- Tropical cyclones
- Pandemic illnesses, and
- Cyber security.

Business continuity, defined as those risks that have a very low probability of occurrence but potentially a very high impact, and which are not already being covered by either self insurance risk quantification, or any other regulatory cost pass through mechanism, fall into this category of self insured risks. Given the difficulty in quantifying this class of risk, Country Energy believes that regulatory approval for pass through of actual costs incurred in mitigating such events should be allowed.

Retailer of last resort – Under the *Electricity Supply Act* 1995 and the regulations made under that Act, Country Energy has certain responsibilities and obligations should a last resort supply event occur. As the probability of the risk is low, the likely consequence is unknown and unquantifiable.

Country Energy believes this risk would be most efficiently treated through a cost pass through arrangement so that Country Energy can seek recovery of any costs incurred when such events, which are beyond the control of Country Energy, arise.

Workers compensation – Country Energy is exposed to the risk that there is a substantial increase in our workers compensation insurance premium during the *regulatory period*, which can be adjusted for reasons beyond Country Energy's control. As there is no reliable way to estimate either the timing or magnitude of any future increase and it is outside Country Energy's control, Country Energy believes that there should be a cost pass through mechanism to recover unanticipated costs arising during the *regulatory period*. As participation in the NSW workers compensation scheme is compulsory, there are clear parallels with costs increases arising from regulatory or statutory changes that are currently allowed to be recovered by a pass through scheme.

9.4 Demand management incentives

Country Energy supports the *AER*'s decision to continue the D factor scheme in NSW and the implementation of the demand management innovation allowance for the *next regulatory control period*.

To date, Country Energy has made only modest claims under the current D factor scheme due to the limited compatibility between currently available technologies for non network alternatives and the specific nature of emerging network constraints in our service area. Much of the capital investment in Country Energy's network is driven by reliability issues on radial powerlines and, to date, available demand management options have been unable to provide a reliable, economic alternative in these circumstances.

The most effective demand management applications are associated with marginal load reductions which defer high cost network augmentations. Network demand growth is generally driven by population growth particularly along the coastal strips in conjunction with the increase in individual demand due to lifestyle factors. Air conditioning has been a major contributor to an emerging summer peaking trend and this has proven to be difficult to address using conventional non network options.

There are comparatively few large customers or embedded generators in Country Energy's network, which limits opportunities for large scale load reductions in locations that are subject to network constraints.

Country Energy continually reviews emerging and innovative technologies through participation with the CSIRO, CIGRE, Energy Networks Association Demand Management and Embedded Generation Committee. Country Energy also monitors national and international research and participates in demand management programs such as the Demand Management and Planning Project and International Energy Agency Demand Side Management Program.

We currently consider demand management alternatives as an integral component to our network planning process and are looking for opportunities in regard to the implementation of non network alternatives to reduce peak demand on constrained areas on our network with a view to improving the utilisation of network assets and delivering savings to customers.

Country Energy has considered the issues addressed in the decision and guideline issued by the *AER* in February 2008. The extension of the D factor scheme will allow more time to develop this incentive whilst the introduction of the demand management innovation allowance will assist Country Energy overcome barriers in developing broad based and innovative programs across our network.

As an electricity distribution network business, we are in a unique position to identify demand management opportunities and deliver successful demand management programs which can deliver value to the community. Country Energy looks forward to developing programs to be presented in our initial annual pricing proposal in May 2009.

9.5 Efficiency Benefit Sharing Scheme

The purpose of the EBSS is to share efficiency gains and losses between distributors and distribution network users. In order to be able to accurately determine efficiency gains or losses from year to year, it is vital that allowed and actual costs during the *regulatory period* are compared on a like for like basis.

Country Energy supports the nominated cost categories under the EBSS released by the *AER* in February 2008 that are to be excluded from the operation of the EBSS in its *regulatory proposal*.

Country Energy believes the framework and methodology in applying EBSS still require further development and welcomes the opportunity to work with the *AER* on the operation of EBSS during the course of the review process.

9.6 Service Target Performance Incentive Scheme

Country Energy supports the position reached by the *AER* that the best approach to service performance reporting for the *next regulatory period* is to continue information collection and monitoring, supplemented by a paper trial based on the yet to be developed National Service Target Performance Incentive Scheme (STPIS) under Section 6 of the NER. This practical approach will continue to provide effective commercial incentives to maintain and improve service performance levels. Country Energy welcomes the opportunity to work with the *AER* in developing a robust and comprehensive STPIS.

9.7 Miscellaneous and monopoly services

The *AER*'s proposed approach to determining a schedule of charges for miscellaneous and monopoly services and emergency recoverable works is consistent with the approach adopted by IPART for the *current regulatory control period*. Country Energy acknowledges that timing constraints for this *regulatory proposal* require a need for simplicity in the charges for these services.

Country Energy agrees with the position put forward by the *AER* that any under or over recovery gained by non cost reflective charges will essentially be recovered through standard control service charges under the weighted average price cap. However, Country Energy remains of the opinion that in the future these charges need to be analysed to ensure they are at cost reflective levels in order to signal to retailers and customers the true cost of delivering the services

The provision of miscellaneous and monopoly services by Country Energy is a labour intensive activity. Country Energy has therefore applied both the CPI and a labour escalation factor to the *current regulatory control period* charges. The labour escalator can be found in the cost escalation report attached as Appendix C. Table 9.1 below depicts the proposed labour charges for the *next regulatory control period* from 1 July 2009 to 30 June 2014.

Labour Class	Hourly Rate ($ 2008-09))
Admin R1	67
Design R2	83
Inspector R2b	83
Engineer R3	100

Table 9.1: Charges for Labour

Table 9.2 below depicts the proposed miscellaneous service charges for the *next regulatory control period* from 1 July 2009 to 30 June 2014.

Miscellaneous Service ($ 2008-09)	$ (as at 1 July 2009)
Special Meter Reading	46
Meter Test	76
Supply of conveyancing information - desk inquiry	38
Supply of conveyancing information - field visit	76
Off-peak conversion	62
Disconnection visit (acceptable payment received)	46
Disconnection at meter box	92
Disconnection at pole/pillar top	154
Rectification of illegal connection	230
Reconnection outside business hours	98

Table 9.2: Charges for Miscellaneous Services

Table 9.3 overleaf illustrates the charges proposed for monopoly services for the *next regulatory control period* .In the case of rural overhead subdivision and rural extensions, the charge applies to inspections (other than substation poles) and represents the total charge for the three separate visits. For substation poles, the charge for Accredited Service Provide grade A is $290 for grade B is $579 and for grade C is $730 for the *next regulatory control period.*

Monopoly Service	Underground urban residential subdivision (vacant lots)	Rural overhead subdivisions and rural extensions	Underground commercial and industrial or rural subdivisions (vacant lots - no development)	Commercial and industrial developments	Asset relocation or street lighting
Design information	Up to 5 lots $ 165 6 to 10 lots $ 248 11 - 40 lots $ 413 Over 40 lots $ 496	R2 per hour	R2 per hour	R2 per hour	R2 or R3 per hour
Design certification	Up to 5 lots $ 83 6 to 10 lots $ 165 11 - 40 lots $ 248 Over 40 lots $ 331	1 - 5 poles $ 83 6 - 10 poles $ 165 11 or more poles $ 248	Up to 10 lots $ 165 11 - 40 lots $ 248 Over 40 lots $ 496	R3 per hour	R2 or R3 per hour
Design rechecking	R2 per hour	R2 per hour	R2 per hour	R3 per hour	R2 or R3 per hour (See par 4.2)
Inspection of service work (Level 1 work)	Grade / A per lot / B per lot / C per lot First 10 lots: $ 42 / $ 100 / $ 207 Next 40 lots: $ 25 / $ 58 / $ 125 Remainder: $ 8 / $ 33 / $ 58	Grade / A per lot / B per lot / C per lot 1 - 5 poles $ 50 / $ 100 / $ 182 6 - 10 poles $ 42 / $ 83 / $ 165 11 + poles (see para 4.2) $ 33 / $ 58 / $ 125	Grade / A per lot / B per lot / C per lot First 10 lots $ 42 / $ 100 / $ 207 Next 40 lots $ 42 / $ 100 / $ 207 Remainder $ 42 / $ 100 / $ 207	R 2 or R3 per hour	R2 or R3 per hour (See par 4.2)
Access permit	Residential subdivisions:	$ 1,227 maximum per access permit	$ 1,227 maximum per access permit	$1,221 maximum per access permit	$1,221 maximum per access permit
Substation commissioning		$ 920 maximum per access permit	$ 920 maximum per access permit	916 per substation (see para 4.2)	$916 per substation (see para 4.2)
Administration	Up to 5 lots $ 201 6 to 10 lots $ 268 11 - 40 lots $ 335 Over 40 lots $ 402	1 - 5 poles $ 201 6 - 10 poles $ 268 11 or more poles $ 402	R1 per hour (max 6 hours)	R1 per hour (max 6	R1 per hour
Notice of arrangement	$ 201				
Re-inspection (level 1 and 2 work)	R2 per hour (maximum 1				
Re-inspection (Service Provider)	$ 82.67 For the purpose of clause 2(b), a DNSP may charge a fee that is less than this fee, but not a fee that is more than this fee.				
Access	R1 per hour				
Authorisation	$ 165				
Inspection of service	All service				
	A Grade: $ 21 per NOEW	B Grade $ 34.12 per NOEW	C Grade $ 99.73 per NOEW		
	(NOSW = Notification of Service Work)				
Site establishment	$ 144				

Table 9.3: Charges for Monopoly Services ($ 2008-09)

9.8 Transitional issues

9.8.1 Transmission 'overs and unders' account

During the course of the *current regulatory control period*, Country Energy has operated with a positive balance in its transmission 'overs and unders' account. The balance of this account is made up of:

- an opening balance (an amount relating to distribution use of system charges resulting from the transition from the 1999-00 to 2004-05 *regulatory period* to the *current regulatory control period)*
- the difference between transmission related payments and transmission cost recovery tariffs, and
- interest accrued on the positive balances.

For Country Energy, the opening balance, and interest accrued on that balance, represents a significant proportion of the positive balance.

Country Energy proposes to, and has, deducted the amount of the forecast balance (as at 30 June 2007) from the first year building block revenue in our revenue requirements for the *next regulatory control period*. The deduction applied for the purposes of this *regulatory proposal* is likely to be higher than necessary, as the actual closing balance as at 30 June 2009 is likely to be lower than the current forecast of the balance.

Country Energy regards this as a transitional issue which should be addressed in the *AER*'s *distribution determination.*

9.8.2 Omitted assets from previous RAB

The accurate valuation of the RAB is a critical step in determining the revenue stream necessary to support the business, and is critical for the incentives it provides for future investment. A number of material inaccuracies existed in the initial 1999 asset valuation, and these have perpetuated through into subsequent roll forward valuations. Country Energy firmly believes that the opening RAB at 1 July 2009 must be confirmed as robust and accurate before the roll forward model can be applied.

Country Energy proposes a corrected roll forward RAB that adjusts the opening balance as at 1 July 2009 for omitted assets from the previous valuation, totalling some $296 million in 2008-09 dollars. Country Energy would welcome the opportunity to work with the *AER* on issues relating to establishing the opening RAB as at 1 July 2009.

- *1999 IPART asset valuation*

  IPART determined a value for system assets as at 1 July 1999 as part of its 1999 *determination*. This valuation was based on an Optimised Depreciated Replacement Cost (ODRC) valuation carried out as at 30 June 1998 for each of the predecessor distributors. The ODRC system asset value adjusted for historical capital contributions was assessed to be $1,539 million. IPART accepted this asset value for system assets and a written down value for non system assets. These values were then rolled forward to determine the opening asset value for Country Energy as at 1 July 1999.

  The initial ODRC asset valuation had assumed no inaccuracies in terms of asset quantities. However the valuations were struck during a period when the electricity industry was undergoing major changes as a result of regulatory and structural changes, including the amalgamation of the smaller rural distributors in NSW. These events placed enormous demands on the resources of the distributors at that time, particularly the smaller rural distributors that formed Country Energy.

Further, the 1998 valuation was derived from the various asset registers of the predecessor distributors that varied in quality.

This meant that the initial 1999 RAB had a number of deficiencies, and several classes of assets were omitted and undervalued. There has been a perpetuation of these errors from the initial valuation through into subsequent roll forward valuations by IPART.

- *2002 ODRC System Asset Valuation*

  In 2002 NSW Treasury engaged a consortium consisting of SKM and PriceWaterhouseCoopers (PwC) to carry out an ODRC valuation of the system assets of the NSW distributors as at June 2002. The distributors needed accurate, updated, and consistent valuations for a range of purposes including:

  - To provide the shareholder with information about the values of system assets
  - To provide information to IPART as part of the *IPART determination*, and
  - For internal management purposes.

  In carrying out the ODRC valuation, SKM reviewed the standard asset unit replacement costs and effective lives for all assets classes. Using the ODRC methodology, SKM valued Country Energy's system assets to be $2,676 million (excluding capital contributions) as at 30 June 2002. This asset valuation was found to be materially higher than the same point in time asset value using a roll forward of the 1999 RAB to 30 June 2002.

  It needs to be recognised that SKM undertook a fresh, independent ODRC valuation of Country Energy's assets in 2002. A full ODRC valuation addresses issues that will tend to both increase and decrease the RAB, and as such did not give Country Energy any opportunity to exploit any perceived information asymmetry by highlighting only issues that would increase its RAB. The fact remains that the ODRC valuation demonstrated a wide gap in comparison to the roll forward, and the size of this gap is much greater than the RAB adjustment that Country Energy is now seeking in this *regulatory proposal* on as discussed below.

- *Material inaccuracies discovered in the 1998 asset valuation*

  In 2003 Country Energy separately sought the expert advice of SKM and requested that they investigate, identify, and quantify the material inaccuracies in the initial 1998 asset valuation.

  Following their investigation, SKM concluded that the inaccuracies amounted to $420 million primarily due to omitted assets. In addition, SKM identified that the optimisation of some rural asset classes that had been performed in the 1998 valuation was incompatible with the context of these assets in 2002, and that the unit rate values applied in 1998 valuation reflected 1995 asset replacement costs. SKM also found that the IPART valuation of non system assets in the 1999 *determination* was inconsistent with the valuations provided in the audited regulatory accounts of the former distributors at that time.

  A summary of the discrepancies between the 1998 and 2002 ODRC valuations provided by SKM is shown in Table 9.4[3]:

[3] SKM, *Review of Asset Values and IPART Preliminary Analysis Final Report - Country Energy*, October 2003 (hereafter the 'SKM Review'), p4.

Inaccuracy	SKM estimate ($ M 1998)
Unit Rates	151
Omitted assets – southern region and zone substations	98
Omitted assets – underground service cables	122
Optimisation of overhead powerlines and rural transformers	18
Non system assets	31
Total error in 1998 RAB	**420**

Table 9.4: Summary of RAB corrections as recommended by SKM for material inaccuracies

Country Energy is seeking an adjustment to the opening RAB as at 1 July 2009 to account for the undervaluation of several classes of assets that were omitted from the previous valuation. Country Energy is not seeking an adjustment for the re-optimisation of rural overhead powerlines and transformers, non system assets, or issues related to unit rates in the previous valuation.

- *Omitted assets in the previous valuation*

  Country Energy has, for some time now, invested and made significant efforts towards improving its asset information systems that helped to identify the omitted assets. Following the 1998 ODRC valuation, Country Energy has been able to obtain additional and higher quality asset information as a result of the introduction of a more sophisticated geographic information system, asset management system, and improved data capturing across all its regions. The improved information enabled SKM to identify and quantify the errors and omissions in asset quantities between the respective asset valuations in 1998 and 2002[4]:

  > *'The findings of 2002 electricity distribution valuation in NSW and improvements in Country Energy's asset information systems and data has identified a number of adjustments to asset groups that would be required so as to more completely reflect the asset position at 30 June 1998.'*

  These missing asset errors resulted from four main areas[5]:

  - Prior to 1998, TransGrid transferred some assets to the former distributor Great Southern Energy, including zone substations and 132 kV overhead powerlines. Some of these assets were not recognised in the 1998 valuation
  - A comparison of the substations included in the 1998 and 2002 valuations identified eight zone substations, which were commissioned prior to 1998, that were omitted from the former Great Southern Energy's asset base and four zone substations, which were commissioned prior to 1998, that were omitted from the former NorthPower's asset base
  - The asset database used in the 1998 former Great Southern Energy asset valuation was based on data gathered in 1995, and as such did not accurately reflect the asset position as of 30 June 1998, and
  - The low voltage underground service cable asset class was not included in the 1998 valuation.

[4] SKM Review, p 14
[5] SKM Review, p 14

In relation to the asset information systems that were used to identify the missing zone substation assets, SKM noted that[6]:

> *'The data systems quality assessment for Country Energy for the 2002 valuation ranked the asset register as comprehensive, a ranking that was supported by an extensive field verification program.*
>
> *Given this high level of confidence in the asset register used in 2002, a comparison has highlighted a number of substations that were omitted or missed in the 1998 asset base…*
>
> *It is recommended that the RAB be adjusted by $11.2M to reflect these missed assets'*

SKM highlighted the omitted assets that were constructed by the former Great Southern Energy during the period 1995-1998 that were not included in the initial RAB[7]:

> *'…In the 1998 GHD valuation report for [the former] Great Southern Energy, it was noted that… For this valuation, GSE presented distribution system data in an Excel spreadsheet which was said to be a summary of the 1995 valuation….*
>
> *This was reiterated in the executive summary of this GHD report where it was noted that '… [the former.] Great Southern Energy is in the process of significant work in asset identification and verification. However as this is not finalised the valuation has had to rely on 1995 data.'*
>
> *Between 1995 and 1998, capital expenditure for [the former] Great Southern Energy was used to install zone substations, subtransmission and distribution lines, cables and equipment, and low voltage assets to deliver services to then increased number of customers, and this expenditure must be recognised in the 1998 RAB to ensure a consistent application of the asset valuation methodology to all of the NSW distributors in the 1998 valuation. The quantity of assets across the broad asset groups installed during this period is not available…*
>
> *Based on these results, the total value proposed by PwC is consistent with capital expenditure acknowledged by the IPART Section 12A report, and the $87M proposed in the Section 12A report is considered appropriate for the proposed adjustment to the 1998 asset base.'*

Underground service cables were excluded from the 1998 valuation. In reference to the underground service cables, SKM commented[8]:

> *'The Steering Committee for the 2002 valuation of the NSW distributors reconsidered this issue, and considered these underground services should be included in the distributors' asset register given that the maintenance of these services were provided for within the distributors' operational maintenance expenditure. As a result, these services were included in the 2002 DORC valuation with an adjustment for the customer capital contributions.*
>
> *The PwC report on the roll forward for the regulatory period 1999 to 2004 estimated that the retrospective inclusion of these underground service cables in the 1998 asset base would increase the 1998 ODRC valuation by $161M. The capital contributions for this period were determined to be 24.2% or $38.96M.'*

[6] SKM Review, p 14-18.
[7] SKM Review, p 19.
[8] SKM Review, p 19.

SKM assessed that the impact of these asset base quantity changes was valued at $220.2 million in 1998 dollars comprising:

- $98.2 million for omitted assets in the former Great Southern Energy region and zone substations, and
- $122 million for underground service cables.

The value of these missed assets in 2008-09 dollars is estimated to be $296 million.

In their report to Country Energy, SKM reinforced that all of these assets physically exist and that it would be reasonable that errors in the existing asset base for Country Energy be corrected prior to being rolled forward.

The omitted assets exist, the value of which have been supported by the separate and independent assessment that was carried out for Country Energy in 2003.

- *Recent changes to the National Electricity Rules*

  The transitional *Rules* provide guidance regarding the issues that must be considered before adjustments can be made to the RAB. A key component of this is clause 6.5.1(a) which states that the RAB is the value of all assets used to provide *standard control services* to the extent they are used to provide such services.

  Clause S6.2.1(e)(8) of the transitional *Rules* explicitly provides that the previous value of the RAB may be increased by the inclusion of past capital expenditure that has not been included in that value, but only to the extent that such past capital expenditure meets certain conditions. Each of these conditions is discussed individually below in the context of the omitted assets.

- *Relates to an asset that is used for the provision of standard control services*

  As confirmed by SKM, these missed assets physically exist, have been prudently invested, and form a critical part of Country Energy's electricity distribution network. They are properly required to support the provision of *standard control services* to current customers. These omitted assets are fully utilised for this purpose. This compares with redundant assets that no longer provide service or provide only a reduced quantity of service, the value of which would be removed from a distributor's RAB. The decision by IPART to reject an adjustment to the RAB for omitted assets is equivalent to classifying them as redundant.

  Unlike a competitive market, Country Energy has an obligation to connect customers to its electricity network, which under legislation it has no choice or right of refusal, irrespective of whether that connection is economic, and to continue to provide *standard control services* in accordance with good electricity industry practice.

  The effect of the failure of IPART to adjust the RAB for the inclusion of these omitted assets has meant that past investments in rolling out an electrical network to rural customers, which Country Energy had no choice or right of refusal, has been disallowed.

- *Is considered by the AER to be reasonably required in order to achieve one or more of the capital expenditure objectives*

  The defined capital expenditure objectives in the transitional *Rules* require that capital expenditure achieve one of the following:

  - Meet the expected demand for *standard control services* over that period
  - Comply with all applicable regulatory obligations associated with the provision of *standard control services*
  - Maintain the quality, reliability and security of supply of *standard control services*, and
  - Maintain the reliability, safety and security of the distribution system through the supply of *standard control services*.

  As noted earlier with reference to the SKM investigation of these omitted assets, they include a variety of asset classes such as subtransmission assets transferred from TransGrid, zone substations, overhead distribution powerlines, cables and equipment, and low voltage assets that have been constructed to deliver *standard control services* to our customers.

  These capital investments are necessary for compliance with our service obligations and to maintain network performance. More specifically they ensure:

  - Sustainability of network condition, asset utilisation, and security
  - Adequate capacity for additional load and customer connections
  - Renewal and replacement of ageing assets that had become unserviceable frequently failed in service, or have deteriorated to an unsafe or risky condition
  - Satisfactory reliability and quality of supply performance and to meet customer expectations, and
  - Safety responsibilities are met.

  If customers were deprived of these omitted assets, it would be necessary for Country Energy to replicate them in order to continue to provide *standard control services* that depend on these existing assets.

- *Is properly cost allocated to standard control services?*

  While the omitted assets have not been formally recognised by IPART as contributing to the RAB value, Country Energy is still required to maintain them for the purposes of providing *standard control services*. Upon inclusion in the RAB only the portion of these omitted assets utilised to deliver *standard control services* will be included in the prospective revenue requirements.

  We believe that the economic costs of service provision and limits on price increases should be transparent, and not conducted on the basis of artificially lowering the RAB. An environment where reasonable expenditures made by a distributor during a *regulatory period* can be excluded, on the basis that they are sunk by the time they will be approved at the next *distribution determination*, places undue risks on the businesses.

- *Has not otherwise been recovered*

  Basing regulated cost building block decisions on the most accurate and best available information regarding the RAB would appear to be the most reasonable and balanced approach moving forward. Perpetuating known past errors would be inconsistent with providing a sustainable commercial revenue stream.

  Country Energy should be given the opportunity to earn a stream of revenue that recovers the cost of delivering *standard control services* over the expected life of efficient investments, including providing a fair and reasonable asset return. Accordingly, a sustainable network revenue stream should include all previous prudent investments.

  To the extent that it was responsible in part for these omissions, Country Energy has already lost revenues attached to the missing assets. The commercial reality of the *IPART determination* is that Country Energy has been denied an opportunity to recover capital returns on efficient and required investments. The current capital under recovery has been funded entirely by Country Energy. It is not fair or reasonable for this situation to continue. Customers have enjoyed lower prices as a result of errors in the RAB, and it is not Country Energy's intention for these foregone revenues to be recovered. However, going forward it is reasonable and balanced that notional revenues be based on an accurate RAB that includes the omitted assets.

  Where assets are 'used and useful', the asset value should be based on the service they deliver, and at the efficient costs of delivering this service. A 'used and useful' test would apply to the assets that Country Energy is seeking to include in its adjustments. In a workable competitive market, distributors would not be denied the opportunity to reasonably recover a sustainable commercial revenue stream on the capital investments it has made, except where these assets are not 'used and useful'. Equally, investors in a competitive market face some risk that inappropriate investments may be written down or made redundant because of a competitor.

  In our opinion, the policies and requirements of previous governments must be recognised in terms of the treatment of the RAB so that electricity networks developed to fulfil policy and legislative objectives are not written down on the basis of price path objectives.

  We believe that the omitted assets are a critical issue to be resolved for the establishment of accurate cost building blocks. Country Energy continues to hold the view that the corrections that it had previously proposed to the RAB provide a fair and reasonable balance in terms of the transitional *Rules* requirements.

  Based on the above analysis, the conditions necessary for the inclusion of the omitted assets in the RAB in accordance with the transitional *Rules* are satisfied. Accordingly, there would appear to be no regulatory barriers to the correction of the RAB, as it is now supported by regulation and policy, as well as regulatory precedence as per the discussion below.

- *Precedents for the inclusion of omitted assets in the RAB*

  Country Energy believes that regulatory precedents exist for inclusion of omitted assets.

  The QCA, as part of its 2005 *determination*[9], commissioned SKM to prepare a new ODRC asset valuation for both Energex and Ergon Energy as at December 2003. This was done to ensure that the asset valuations were soundly based having regard to the quantum, condition and value of the regulated assets before adopting a roll forward approach to future valuations. QCA was not convinced that the previous valuation carried out in 1999 provided it with the certainty it required in this regard.

  The valuations determined by SKM were higher than the previous valuations. The updated valuation derived for Energex was some $584 million (18 per cent) higher than that for the same point in time as QCA's 2001 *determination* based on the 1999 valuation and forecast capital expenditure. Similarly, the updated valuation of Ergon Energy was around $840 million (29.3 per cent) higher than that estimated for the same point in time in the 2001 *determination*.

  SKM identified the major contributing factors to the increased valuations between the previous valuation in December 1999 and the updated valuation in December 2003. These reflected some method changes, changed circumstances, and errors in the assets unaccounted for in the previous 1999 valuation. In relation to the latter, for Energex this represented a $123 million increase and for Ergon Energy a $228 million increase to the asset base. The valuation was based on audited records of asset quantities.

  In establishing the opening RAB for the 2005 *determination*, QCA accepted the updated SKM valuations as at December 2003 including the adjustments due to omitted assets from the previous valuation, which were then rolled forward 18 months to arrive at opening RAB values commencing 1 July 2005.

  Another example was the ACCC Victorian transmission revenue cap decision in December 2002 that allowed the inclusion in the initial RAB of the missed transmission assets from a previous valuation[10].

  Adjustments to valuation of electricity distribution assets should be reviewed in light of developments and refinements in best practice asset valuation reflected in other jurisdictions. The QCA and ACCC decisions would appear to set a precedent that errors in the existing asset base due to omitted assets (and inappropriate or unreasonable optimisation) can and should be addressed in rolling forward of the asset base at subsequent *determinations*. We believe that the approaches discussed above provide a fair and reasonable means of resolving the issue.

- *Adjusted RAB as at 1 July 2009*

  The RAB is rolled forward from July 2004 to June 2009 to reflect capital expenditure, inflation, depreciation and disposals in each year, with forecasts applied for the 2008 and 2009 financial years, as described in Section 7.3. A correction would need to be made by treating the adjustment for omitted assets in 2008-09 dollars as a 'lump sum' capital expenditure in the last year of the *current regulatory control period*, prior to establishing the opening RAB at 1 July 2009. An adjusted RAB is illustrated in Table 9.5 below.

[9] QCA, *Final Determination Regulation of Electricity Distribution*, April 2005, p 57-68.
[10] ACCC, Decision: Victoria Transmission Network Revenue Caps 2003-2008, December 2002.

$M (nominal)	2004-05	2005-06	2006-07	2007-08	2008-09
Opening RAB	2,439	2,649	2,921	3,297	3,741
Plus all capital expenditure	284	363	458	499	602
Plus deferred depreciation	-	10	21	33	48
Less actual depreciation	135	157	173	198	226
Less asset disposals	7	7	7	7	7
Plus indexation	68	62	78	117	87
Less difference between actual and forecast capex	-	-	-	-	10
Plus Omitted Assets	-	-	-	-	296
Closing RAB	2,649	2,921	3,297	3,741	4,532

Table 9.5: Adjusted RAB to reflect inclusion of omitted assets

Country Energy seeks an adjustment to the RAB due to the undervaluation of several classes of assets for material errors and omissions in the regulatory asset registers that were used in a previous asset valuation. These material errors and omissions have been previously independently reviewed and confirmed. It is our view that the roll forward of the RAB should not be based on known errors, and must be corrected. Otherwise inherent data inaccuracies are simply replicated in later valuations when the roll forward approach is applied.

The adjusted closing RAB as at 30 June 2009 for Country Energy should be $4,532 million. Country Energy would welcome the opportunity to work with the *AER* on issues relating to the opening RAB for 1 July 2009.

9.8.3 Corporate income tax – setting the tax base

In order to move from IPART's pre tax framework to the *AER*'s post tax framework, it is necessary for Country Energy to present the tax value of its RAB.

Country Energy has reconciled its tax assets to the RAB as of 30 June 2007. The value of these tax assets has then been rolled forward to 30 June 2009 utilising forecast regulated capital expenditure for the 2008 financial year and budgeted regulated capital expenditure for the 2009 financial year. These closing values have then been inserted into the PTRM as the opening 1 July 2009 tax values. The standard tax lives used are from the tax asset register and are in accordance with taxation principles.

As a result of the above methodology, Country Energy has not used the tax roll forward sheet included in the *AER*'s roll forward model. Country Energy did not roll the 30 June 2007 tax asset values back to the commencement of our participation in the National Tax Equivalence Regime as it would be of little value and would have resulted in rolling forward to the same 30 June 2007 value used in any case.

Country Energy has compiled a significant amount of information to substantiate the tax asset base value at 30 June 2007 and would be pleased to work with the *AER* during the review process to demonstrate its robustness and completeness.

Revenue requirements

10 Revenue requirements

10.1 Overview

This section details the calculation of Country Energy's annual revenue requirement in accordance with the building block approach outlined in the transitional *Rules* and the *AER*'s PTRM. A summary of the building block components and the unsmoothed and smoothed revenue for each year of the *next regulatory period* is presented.

The remainder of this section is structured as follows:

- Section 10.2 summarises the key provisions of the *Rules* relating to establishing the annual revenue requirement for each year of the *next regulatory control period*
- Section 10.3 presents each component of the building blocks established in the preceding sections of this *regulatory proposal*
- Section 10.4 details the calculated unsmoothed annual revenue requirement resulting from the building block components
- Section 10.5 presents Country Energy's proposed smoothed revenue requirement for each year of the *next regulatory period*, including a description of the X factors adopted
- Section 10.6 discusses revenue requirement adjustments that may occur in during the *next regulatory period,* and
- Section 10.7 provides a brief discussion on Country Energy's pricing strategy for the *next regulatory control period.*

10.2 *National Electricity Rules* requirements

Clause S6.1.3(6) of the transitional *Rules* specifies that a building block proposal must contain Country Energy's calculation of revenues including all inputs, X factors and explanations of the calculation and inputs used.

Clause 6.5.9 sets out the *AER*'s obligations in establishing X factors for each year of the *regulatory control period*.

10.3 Building block components

The building block components and their calculated values are described in the sections below.

10.3.1 Regulatory asset base

Table 10.1 below reproduces the calculated RAB from Section 7 for the *next regulatory control period*.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Opening RAB	4,236	4,914	5,613	6,344	7,135
Plus all capital expenditure	798	847	904	955	1,010
Less actual depreciation	218	263	306	316	329
Less asset disposals	9	9	9	9	10
Plus indexation	108	125	143	161	181
Closing RAB	4,914	5,613	6,344	7,135	7,988

Table 10.1: RAB roll forward from 1 July 2009 to 30 June 2014

10.3.2 Return on capital

The return on capital is calculated in accordance with the *AER*'s PTRM. It is calculated by applying the post tax nominal vanilla WACC to the opening RAB for each year of the *regulatory control period*. Table 10.2 below illustrates this calculation.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Opening RAB	4,236	4,914	5,613	6,344	7,135
Return on Capital	413	479	548	619	696

Table 10.2: Return on capital from 1 July 2009 to 30 June 2014

10.3.3 Depreciation

The calculation of regulatory depreciation was carried out in accordance with the *AER*'s PTRM and was detailed in Section 6 of this *regulatory proposal*. Table 10.3 below summarises the regulatory depreciation calculation.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Regulatory Depreciation	218	263	306	316	329

Table 10.3: Regulatory depreciation from 1 July 2009 to 30 June 2014

10.3.4 Operating expenditure

The forecast operating expenditure has been detailed in Section 4 of this *regulatory proposal*. The operating expenditure is summarised in Table 10.4 below.

$M (2008-09)	2009-10	2010-11	2011-12	2012-13	2013-14
Operating Expenditure	408	417	430	445	461

Table 10.4: Operating expenditure from 1 July 2009 to 30 June 2014

10.3.5 Cost of tax

The detailed calculation of the cost of tax was presented in Section 8.4 of this *regulatory proposal*. The cost of tax calculation is summarised in Table 10.5 below.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Tax payable	82	91	101	106	107
Less value of imputation credits	(41)	(46)	(51)	(53)	(53)
Net tax allowance	41	46	51	53	53

Table 10.5: Cost of tax from 1 July 2009 to 30 June 2014

10.4 Unsmoothed annual revenue requirement

The unsmoothed annual revenue requirement for each year of the *regulatory control period* is calculated as the sum of the return on capital, depreciation, operating expenditure and cost of tax allowance. The addition of these building block components is depicted in Table 10.6 below.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Return on Capital	413	479	548	619	696
Economic Depreciation	111	139	164	155	148
Operating expenditure	418	438	463	492	522
Cost of Tax	41	46	51	53	53
Adjustment for transitional issues	(70)	-	-	-	-
Unsmoothed Revenue Requirement	913	1,102	1,225	1,318	1,419

Table 10.6: Unsmoothed annual revenue requirement from 1 July 2009 to 30 June 2014

10.5 Smoothed annual revenue requirement

Country Energy has calculated a smoothed revenue requirement by applying X factors in each year of the *regulatory period* as described in the sections below.

10.5.1 X factors

The proposed X factors presented in Table 10.7 below meet the *requirements* set out in clause 6.5.9 of the transitional *Rules*. Specifically:

- the X factors have been set to minimise the variance between annual revenue requirement in the final year of the *regulatory period* and the building block revenue requirement for that year, and
- the X factors result in an equalisation in net present value terms of Country Energy's total revenue requirement for the *regulatory control period* with the expected smoothed revenue requirement.

Table 10.7 below presents Country Energy's proposed X factors for the *next regulatory control period*.

(real)	2009-10	2010-11	2011-12	2012-13	2013-14
X factor	(23.1%)	(6.8%)	(6.8%)	(6.8%)	(3.0%)

Table 10.7: X factors from 1 July 2009 to 30 June 2014

10.5.2 Smoothed annual revenue requirement

Table 10.8 below presents the smoothed annual revenue requirement resulting from the application of the X factors described above. As can be seen from Table 10.8, the expected revenue in the final year of the *regulatory control period* is close to the unsmoothed revenue requirement for the same year. The *AER*'s PTRM attached to this *regulatory proposal* demonstrates that the smoothed and unsmoothed revenue requirements are equal in net present value terms. The smoothed revenue requirement includes an adjustment in 2009-10 to eliminate the transmission 'overs and unders' account balance as at 30 June 2007. The smoothed revenue for each year is also net of estimated non tariff revenue from miscellaneous and monopoly services.

$M (nominal)	2009-10	2010-11	2011-12	2012-13	2013-14
Smoothed Revenue Requirement	964	1,072	1,191	1,324	1,420

Table 10.8: Smoothed annual revenue requirement from 1 July 2009 to 30 June 2014

10.6 Revenue requirement adjustments

The revenue requirements calculated in this section will be subject to adjustments during the *next regulatory control period* if any of the following occurs:

- The price change each year will utilise the X factors nominated above and utilising the actual CPI
- Pass though events nominated in Section 9 of this *regulatory proposal* or a pass through event defined in the transitional *Rules*, and
- Demand management incentive scheme programs.

10.7 Pricing strategy

There are a number of differences in Country Energy's network prices which have resulted from the inability to rationalise multiple prices. These prices were implemented by Country Energy's predecessor organisations. Country Energy has attempted to gradually rationalise network prices during the *current regulatory control period*, however network price movements have been subject to regulatory price controls inhibiting full rationalisation. For example, the network prices paid by residential and business customers in our southern regions are lower than in the other regions despite similar network costs. Country Energy's current networks prices can be found on Country Energy's website and 2008-09 indicative networks prices are included in our PTRM. Country Energy's miscellaneous and monopoly rates are available in Section 9.7.

Country Energy's overall strategy is to reduce the number of existing network prices to a few major network wide price structures. These price structures would include time of use (TOU), large TOU, three rate demand, non time of use, controlled load, unmetered supply, with combinations of residential and business classes. This will enhance simplicity for the wider electricity market and ensure equal treatment of all customers.

Country Energy is considering initiatives to refine existing network price structures to ensure they provide the right signals to customers. An underlying aim of our pricing strategy is to raise customer awareness of network investment and operating costs incurred at times of peak demand, as well as addressing the issue of equity between customers. This is likely to promote changes in consumption behaviour that may reduce network costs over time.

Depending on the outcomes of smart metering an expanded application of TOU prices may be required. TOU (and demand) network prices will require progressive expansion to increasing numbers of residential and business customers over the *next regulatory control period*, providing signals for improved load management.

Country Energy has provided customer numbers, revenue and network prices (both actual and indicative) rolled up to a customer class level for *standard control services* in *regulatory information notice* Pro forma 2.2.5 Table 1. A full set of forecast revenue, customer numbers and prices at tariff level are provided in the PTRM within the forecast revenue worksheet supplied with the *regulatory proposal*.

Alternate Control Services

11 *Alternate Control Services*

11.1 Overview

This section provides Country Energy's proposal for the methodology and pricing of public lighting construction and maintenance services.

The remainder of this section is structured as follows:

- Section 11.2 summarises the key provisions of the *Rules* relating to *alternate control services*
- Section 11.3 details the control mechanism that is proposed to apply for Country Energy's public lighting services for the *next regulatory control period*
- Section 11.4 demonstrates Country Energy's compliance with the relevant control mechanism
- Section 11.5 discusses Country Energy's public lighting asset information
- Section 11.6 provides a discussion of the extent to which Country Energy has departed from the *AER*'s statement on the likely approach to the control mechanisms for *alternate control services*
- Section 11.7 presents Country Energy's public lighting service level information
- Section 11.8 discusses historical and forecast capital and operating expenditures for public lighting services
- Section 11.9 provides Country Energy's pricing proposal for public lighting services for the *next regulatory control period* , and
- Section 11.10 summarises Country Energy's views on the factors the *AER* will use in making a decision on our public lighting services proposal.

11.2 *National Electricity Rules* requirements

The transitional *Rules* classify public lighting services as an *alternate control service* for the 2009 to 2014 *regulatory period*. Under clause 6.2.5(c)(2) the control mechanism for public lighting service may consist of:

- a schedule of fixed prices
- caps on the prices of individual services
- caps on the revenue to be derived from a particular combination of services
- tariff basket price control
- revenue yield control or
- a combination of any of the above.

This is addressed in Section 11.3.

In reaching a decision on which of these control mechanisms is appropriate for public lighting services, under clause 6.2.5(d) the *AER* must have regard to:

- the potential for development of competition in the relevant market and how the control mechanism might influence that potential
- the possible effects of the control mechanism on administrative costs of the *AER*, the *RNSP* and users or potential users
- the regulatory arrangements (if any) applicable to the relevant service immediately before the commencement of the *distribution determination*
- the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction), and
- any other relevant factor.

This is addressed in Section 11.10. Clause 6.8.2(3A)(i) requires that a public lighting proposal must contain:

- the proposed control mechanism (refer to Section 11.3)
- a demonstration of the application of the proposed control mechanism (refer to Section 11.4), and
- the necessary supporting information.

11.2.1 AER Guideline

On 29 February 2008, the *AER* published its likely approach to the control mechanism for NSW public lighting services. The *AER* stated that it will likely apply the following forms of control over the *next regulatory period*:

- a schedule of fixed prices in the first year of the *next regulatory control period*, and
- a price path (such as CPI-X) established for the remaining years of the *regulatory control period*.

The *AER* proposed that the initial price levels and the price path will be assessed against the efficient costs of providing public lighting services using a simplified building block approach. The *AER* will allow *RNSP*s to simplify the building block approach in the following ways:

- *RNSP*s will not be required to provide a separate proposal on WACC for public lighting services. *RNSP*s may propose the same WACC as applied to *standard control service*s.
- *RNSP*s may propose reasonable simplifying assumptions within the building block model. In particular, the *AER* will accept the present depreciation assumptions applied by *RNSP*s.
- *RNSP*s may base their opening asset valuation for existing public lighting assets on the existing asset valuation, with any efficient adjustments for capital expenditure and depreciation in the *current regulatory control period*.

These simplified assumptions are discussed in Section 11.6.

The *AER* proposes to assess efficient costs of each business against the specific level of service as set out in the NSW Public Lighting Code (Public Lighting Code). Clause 6.8.2(3A)(ii) of the transitional *Rules* provides that, where a *RNSP* proposes to control public lighting services in a manner that that departs from the *AER*'s published likely approach, the *RNSP's regulatory proposal* must include a statement of the reasons justifying the departure.

The *AER* guideline also requests service level information, including:

- a demonstration of how the proposed costs reflect the levels of service outlined in the Public Lighting Code, and
- procedures for mediating disputes and remedies where service levels have not been met.

11.2.2 Regulatory information notice requirements

Section 2.4.6 of the *AER*'s *regulatory information notice* applicable to *alternate control services* requires the following information to be provided:

1 Information to support the application of the proposed control mechanism including:

(i) an overview of public lighting services provided by the *RNSP*

(ii) a demonstration of the application of the proposed control mechanism and any supporting information

(iii) in the case of a departure from the *AER*'s likely approach to the relevant control mechanisms for *alternate control services*, a statement of the reasons justifying the departure

2 Expenditure information, including:

(i) historic and forecast capital and operational expenditure requirements (see *regulatory information notice* Sections 2.2.1 and 2.2.2)

(ii) justification for any material differences between historic and forecast capital and operating expenditures

3 Asset value information, including:

(i) the opening asset value as at 1 July 2004 and any calculations or documents to demonstrate its derivation

(ii) the proposed opening asset value at 30 June 2009 including adjustments to account for capital expenditure and depreciation

4 Pricing information, including:

(i) a schedule of prices for the first year

(ii) a proposed price path

(iii) indicative prices for each year of the *next regulatory control period* (see *regulatory information notice* Section 2.2.5)

5 Service level information, including:

(i) a demonstration of how the forecast expenditures will deliver the required levels of service outlined in the Public Lighting Code

(ii) details and explanations of any divergence from the NSW Public Lighting Code.

11.3 Proposed control mechanism

Country Energy proposes the following control mechanism be applied to public lighting services for the *next regulatory control period*:

- a schedule of fixed (in real terms) prices for units of public lighting for the five years of the *next regulatory control period*.

Country Energy proposes to continue a form of its existing rebate program to manage price impacts to customers.

These are discussed in more detail below.

11.3.1 Overview of Country Energy's public lighting services

The public lighting service is a bundled service consisting of:

- The provision of energy to the public lighting equipment (a retail service)
- The delivery of that energy to the public lighting equipment (a network service), and
- The construction and maintenance of public lighting infrastructure - Street Lighting Use of System (SLUOS).

This *regulatory proposal* addresses the SLUOS component of the public lighting service only.

Country Energy has over 142,000 street lights serving more than 100 councils across NSW.

Country Energy's objectives in providing street lighting are to:

- provide street lighting services that meet customer needs for effective lighting, reliability, energy efficiency and environmental performance
- maintain a street lighting system that is safe for the community, customers and staff, and complies with AS1158
- fulfil its regulatory requirements including those of DWE as established in the NSW Public Lighting Code, and
- minimise the costs to Country Energy and consequent impacts on pricing for its customers.

Country Energy's Street Lighting Management Plan addresses Country Energy's management structure for street lighting, equipment selection and replacement approach, design and construction approach, maintenance programs and reporting mechanisms.

This section of Country Energy's *regulatory proposal* applies to all street lighting in the Country Energy area which Country Energy owns or is responsible for maintaining. This *regulatory proposal* does not apply to security lighting, decorative lighting, and other special purpose lighting.

11.3.2 Tariff structure

Tariffs for the provision of public lighting services are structured a number of different ways, depending on:

- whether the construction and maintenance of the public lighting installation is provided by Country Energy or the customer
- whether the customer or Country Energy is responsible for funding the asset's replacement at the end of its useful life, and
- whether those lights are metered.

The different combinations are reflected in the tariff structure for public lighting services, as shown in Table 11.1 below.

Tariff	Capital provision	Maintenance responsibility	Replacement responsibility
Rate 1 (obsolete)	Country Energy	Country Energy	Country Energy
Rate 2	Customer	Country Energy	Country Energy
Rate 3	Customer	Customer	Customer
Rate 4 (obsolete)	Country Energy	Country Energy	Country Energy
Rate 5 (obsolete)	Country Energy	Customer	Country Energy
Rate 6	Country Energy	Customer	Customer
Rate 7	Country Energy	Country Energy	Country Energy
Rate 8	Customer	Country Energy	Customer

Table 11.1: Tariff structure for public lighting services

Obsolete tariffs no longer apply to new installations.[11]

Rates 1, 2 and 3 are similar in structure to the same rates offered by EnergyAustralia and Integral Energy.

- *A note on Rate 7*

  Rate 7 could best be described as a 'retrofit' tariff, and applies in cases where one component of the public lighting installation (rather than the complete lantern, outreach and connection) is replaced. This may occur in cases where a council wishes to change the lanterns in a particular area before the existing lanterns have reached the end of their useful lives. As discussed in Country Energy's Street Lighting Management Plan, removal of Country Energy lights before the end of their useful life will require the customer to reimburse Country Energy for the unrecovered depreciated capital value of the assets removed[12].

  This tariff differs from others in that the other tariffs assume the joint installation of an outreach and lantern, and allocate the installation costs between the two components. However, where a lantern is being installed alone, its future revenue stream must recover all the costs of the replacement lantern.

11.3.3 The proposed control mechanism

Country Energy's proposed control mechanism is a schedule of fixed (in real terms) prices for units of public lighting for the *next regulatory control period,* subject to caps on the revenue to be derived from a particular combination of services. This is accomplished through a rebate scheme that mitigates the impact to customers from Country Energy's move to cost reflective prices for public lighting.

This combination of control mechanisms is driven by a number of key considerations detailed below.

- *Administrative simplicity of public lighting pricing charges*

  Country Energy has over 142,000 public lighting installations in service. This large number of relatively low value assets can only reasonably be managed using a simplified tariff structure that is common to all similar fixtures throughout the service territory.

[11] Rate 1 is redundant for new installations, but will remain available for transfers on replacement of existing Rate 2 installations.
[12] Assuming it is equal to half the total replacement value.

- *Stability of published public lighting prices over the regulatory control period*

  Through this *regulatory proposal*, Country Energy hopes to reduce its administrative burden through not having to undertake detailed price analysis of all the various types of public lighting installations in each year of the *regulatory period*. Moreover, Country Energy strives to give customers clear signals regarding the level of their public lighting charges over the *regulatory period*.

- *The need to signal the economic cost of providing the service to public lighting customers*

  In the distribution network, the *RNSP* makes investment decisions based on the optimal balance of cost and service outcomes. In contrast, public lighting investment is largely driven by the customer, based on price. Where prices for public lighting services do not reflect the cost of providing the service, the customer will receive distorted price signals and has scope to make suboptimal investment choices. The cost of these choices will inevitably be borne by the *RNSP*, or by other public lighting customers.

- *The need to manage price impacts to customers in the move to cost reflectivity*

  Country Energy is mindful of the fact that a move to full cost reflectivity must be balanced with the impacts such price shocks may have on individual public lighting customers. Therefore, Country Energy proposes to modify its existing rebate scheme to which will provide 'total bill' rebates to customers subject to sharp price increases, such that the total bill for public lighting services will not increase by more than an agreed threshold. This rebate will necessarily be specific to each customer.

  Country Energy proposes to calculate public lighting prices using a simplified building block approach. The public lighting unit prices will consist of the following building blocks:

  - a return on capital charge, applied using the WACC applicable to *standard control services* provided by the distribution network, and the depreciated replacement cost of the public lighting components in service
  - a return of capital (depreciation) charge, calculated assuming all public lighting assets have a 20 year useful life; and
  - operating and maintenance costs.

11.4 Demonstration of the application of proposed control mechanism

11.4.1 The Building Block Method

The building block approach includes components for a return on and return of capital. As capital is returned to the business through depreciation, less capital remains invested, and the return on capital component declines over time. This presents the customer with a declining tariff over time, which does not necessarily reflect the service capability of the asset.

Moreover, this building block approach presents the customer with a sharp increase in tariffs in the first year of a replacement asset, when the return on capital component must be increased to provide a return on the full amount invested in the replacement asset.

To demonstrate, assume an asset costing $100 with a 10 year useful life, and a real interest rate of 10 per cent. By charging return on and return of capital according to the building block approach, the total tariff will decline over the life of the asset.

Year	1	2	3	4	5	6	7	8	9	10
Capital Cost ($)	100	90	80	70	60	50	40	30	20	10
Return on Capital ($)	10	9	8	7	6	5	4	3	2	1
Depreciation ($)	10	10	10	10	10	10	10	10	10	10
Total tariff ($)	20	19	18	17	16	15	14	13	12	11

Present value of cash flows: $100

In order to apply the building block approach to fairly calculate the return on and return of capital to each customer, Country Energy would need to:

- Know and track the age of every asset in service, and its remaining capital invested, and
- Publish a tariff for each asset according to its age – Rate 1 for a 1 year old asset, Rate 1 for a 2 year old asset, Rate 1 for a 3 year old asset, etc.

Country Energy does not have age related information for every public lighting asset in service. Moreover, a tariff structure that reflected this age profile would be unwieldy and administratively unmanageable for both Country Energy and its customers. Further, the problem of the sharp increase in price at the end of the asset's useful life would still remain.

Country Energy proposes to make a simplifying assumption regarding the 'steady state' average age of the portfolio of public lighting assets in service. In the absence of reliable age related information, the only reasonable assumption open to Country Energy appears to be that the assets are, on average, half way through their useful life.

This assumption would produce a level tariff to the customer, and would also remove the end of life price shock that arises from replacing a fully depreciated asset with a new one. This assumption addresses the key issues with the classic building block approach. However, it must be recognised that this 'half life' assumption introduces a present value loss to the public lighting business, which is unsustainable in the longer term.

To demonstrate, assume an asset costing $100 with a 10 year useful life, and a real interest rate of 10 per cent. By charging return on and return of capital assuming the asset is perpetually half way through its useful life, the total tariff will remain level over the life of the asset, but the cash flows will be insufficient for Country Energy to recover its investment in the asset.

Year	1	2	3	4	5	6	7	8	9	10
Capital Cost ($)	50	50	50	50	50	50	50	50	50	50
Return on Capital ($)	5	5	5	5	5	5	5	5	5	5
Depreciation ($)	10	10	10	10	10	10	10	10	10	10
Total tariff ($)	15	15	15	15	15	15	15	15	15	15

Present value of cash flows: $92

11.4.2 The rebate scheme

Public lighting prices have historically not been cost reflective, with many customers paying less than the cost of providing the service. Country Energy proposes to publish and charge cost reflective prices from 1 July 2009. This may have adverse price impacts for some customers. An existing rebate mechanism will be modified in order to transition customers from the current levels of pricing to cost reflective levels over time.

Country Energy will establish total bill rebates for each public lighting customer. Customer impacts will be managed through the 'erosion' of those rebates over the *regulatory period*.

Providing the annual amounts of this rebate to each public lighting customer in advance of the start of the *regulatory period* will provide certainty and transparency for the customer's public lighting pricing for the entire *regulatory control period*.

As this schedule of rebates includes information specific to individual customers, it has been provided to the *AER* confidentially. During the consultation period, Country Energy is pleased to advise any particular customer of the proposed rebate and transition path on request, and will notify all customers of the rebate and transition path on approval by the *AER*.

Country Energy will calculate the rebate on a total customer bill basis, to allow a portfolio effect offsetting of declining unit prices against increasing unit prices. Under the current rebate scheme, rebates are applied to individual unit prices to achieve pricing outcomes for individual customers. This leads to difficulty in reconciling customer bills to published prices, and different prices being applied to different customers for the same units of service.

Under the revised mechanism, the transitional rebates will be disclosed transparently as a single line item on customer bills. This will allow customers to reconcile their bills against the published prices, and will also demonstrate that the same prices are in effect for different customers across the service territory. The rebate calculations are provided in Appendix L.

The amount of the rebate is calculated each year as the amount required to ensure the customer's total bill does not increase by more that a specified percentage from its previous year's total bill.

The transitional price path will be executed through 'eroding' the rebate over time, such that when it reaches zero, the customer will be paying cost reflective prices for the public lighting service. The length of time required to erode the rebate will depend on the extent of each customer's divergence from cost reflective pricing.

For example assume a customer's 2008-09 total bill is currently $100, and is required to increase to $120 (in real terms) to cost reflective prices. If we assume the maximum 'total bill' increase is limited to 7 per cent real, the rebate would be calculated to manage that total bill constraint as shown below:

	Cost reflective bill ($)	Rebate ($)	Net bill ($)	Annual total bill increase
2008-09			100	
2009-10	120	13	107	7.0%
2010-11	120	6	114	7.0%
2011-12	120	0	120	4.8%
2012-13	120	0	120	0.0%
2103-14	120	0	120	0.0%

Table 11.2: Rebate to manage total bill constraints

In summary calculating the rebate at the total bill level:

- allows all installations to be priced at the published cost reflective prices
- provides public lighting customers with certainty on their public lighting costs for the entire *regulatory period*
- removes the complexity required to calculate rebates at the component level
- allows all customers to be charged the same price for the same component, and
- increases transparency for customers in reconciling their bill against the posted prices and the inventory of installations in service.

Information on the current cost of public lighting equipment, inventory in service, and the methodologies and calculations used to determine proposed prices has been provided to the *AER* in Country Energy's public lighting pricing model.

Information of prices and rebates is provided in Appendices K (prices - public) and L (rebates – confidential). Relevant financial models are maintained for the *AER* to view on request in accordance with *regulatory information notice* Section 2.5.

11.5 Asset value information

The return on capital and return of capital components are based on the current replacement cost of the public lighting installations, assuming that each installation is perpetually half way through its useful life. In this regard, the return on capital is levied on half the replacement cost of the assets.

11.5.1 IPART roll forward asset valuation

It should be noted that Country Energy does not support a public lighting price *determination* process that relies on a notional IPART asset valuation. The process of calculating a revenue requirement using an aggregate asset valuation to calculate an aggregate return on capital, and an estimate of the weighted average useful life of the asset portfolio to calculate a total return of capital, results in prices that are derived by 'smearing' that revenue requirement across the assets in service. This would not be expected to result in prices that reflect the underlying cost of providing the relevant service.

As discussed above, signalling the cost of providing the service is important to ensure that public lighting customers can make informed choices regarding the public lighting options open to them.

- *Relevance of IPART asset valuation*

  Under IPART's *Regulation of Excluded Distribution Services Rule 2004/1*, IPART was empowered to approve or disapprove the proposed prices for public lighting services of a Distribution Network Service Provider (*DNSP*, and since redefined as an *RNSP)*. The criteria under which IPART gave or denied this approval were in summary:

  - prices are to signal the economic costs of service provision
  - underlying service classifications, cost data, etc should be periodically reviewed and updated
  - the *RNSP* must provide information on the service, tariffs, and terms and conditions,
  - the *RNSP* was required to provide a report to the Tribunal demonstrating the costs of providing the service, the applicable service standards, and how the *RNSP* proposed to manage customer impacts.

The Tribunal did not reserve powers to amend the prices proposed by the *RNSP*, rather it retained powers only to reject the proposal and require the *RNSP* to file a new proposal. While the Tribunal required the prices to signal the economic cost of providing the service, it did not provide any guidance as to how the *RNSP* might demonstrate this, nor any guidance as to how it might assess the proposed prices as meeting this criterion.

Under this Rule, there was no public lighting capital base determined, nor were prices related in any way to any notional capital base. Country Energy considers that it would be inappropriate to now require the *RNSP*s to align prices to some notional, aged asset valuation whose foundation is unclear.

- *Regulatory information notice Section 2.4.6(a)(3)(i): the opening asset value as at 1 July 2004 and any calculations or documents to demonstrate its derivation*

  As discussed above, no public lighting asset value was determined by IPART in its 2004 *determination*. At best, an asset value that could be inferred as relating to the public lighting system can be estimated by:

  - running the *IPART determination* financial model with the switch set to assume that public lighting would be a prescribed service and recording the value of the RAB
  - running the *IPART determination* financial model with the switch set to assume that public lighting would be an excluded service and recording the value of the RAB (attributable to prescribed services), and
  - subtracting the second number from the first.

  While this is the methodology envisioned in the *AER*'s Guideline on *Alternate Control Services*, Country Energy notes that no such exercise was undertaken by IPART to determine the value of the public lighting RAB.

  The value derived from executing this process is $12 million (in $2004).

- *Regulatory information notice Section 2.4.6(a)(3)(ii): the proposed opening asset value at 30 June 2009 including adjustments to account for capital expenditure and depreciation*

  While Country Energy argues that the amount discussed above to estimate an opening asset base is fraught with uncertainty, Country Energy submits that any roll forward of such a capital base would be even more problematic.

  The 2004 *IPART determination* is very clear that IPART determined to defer a significant amount of depreciation from Country Energy's regulatory revenue requirement calculations in order to achieve desired pricing outcomes. But as IPART did not determine a revenue requirement for the public lighting system, its *determination* is silent on whether it proposed to defer depreciation on the public lighting system in a similar manner to that undertaken on the network. There is therefore no reliable indication of the expected rate of depreciation of a RAB relating to the public lighting system.

  In order to comply with *regulatory information notice* Section 2.4.6(a)(3)(ii), Country Energy has attempted to conduct a roll forward of the IPART notional amount using its own accounting depreciation information, as shown in Table 11.3:

				Forecast	Budget
Financial year ($M nominal)	**2004-05**	**2005-06**	**2006-07**	**2008-09**	**2009-10**
Opening value of fixed assets	11.5	12.6	11.6	13.3	15.0
Indexation	0.34	0.29	0.34	0.51	0.37
Capex/Additions (net of cap cons)	1.58	-0.23	2.27	2.36	1.82
Depreciation before deferral	0.88	0.98	1.00	1.14	1.29
Closing value of fixed assets	**12.6**	**11.6**	**13.3**	**15.0**	**15.9**

Table 11.3: Value of Fixed Assets

Assuming a deferral of depreciation similar to that applied in the network would reduce the depreciation amount shown above and increase the notional RAB relating to the public lighting system accordingly.

11.5.2 ODRC Asset Valuation

Country Energy's cost reflective prices are based on the current replacement cost of providing the public lighting service. This valuation has been completed on a component by component basis.

The aggregate replacement cost of the system, then, is calculated by multiplying the current replacement cost of the assets in service by the inventory in service. While the total replacement cost of the public lighting system is $226 million, much of this investment has been funded by others. The total replacement value of the public lighting assets funded by Country Energy is $58 million.

As discussed above, the 'half life' assumption method of pricing produces level tariffs for the assets based on half their replacement cost, regardless of their age. In this respect, the amount of depreciation considered to have been taken on the assets does not impact the pricing.

As also discussed above, Country Energy does not have complete age related information for the public lighting assets in service. Any attempt to estimate the average useful life of the assets would therefore be a guess at best. Again, as discussed above, the best estimate would be to assume that the portfolio of public lighting assets is midway through its useful life. Assuming a straight line depreciation methodology, it would be reasonable to estimate the ODRC value of the public lighting system in the order of $29 million.

11.6 A departure from the *AER*'s likely approach

It is not clear that Country Energy's proposed approach is a departure from the *AER*'s likely approach. The *AER*'s likely approach features:

- a schedule of fixed prices in the first year of the *regulatory control period*

  Country Energy has proposed a schedule of fixed prices in the first year of the *regulatory control period*

- a price path (such as CPI-X) established for the remaining years of the *regulatory control period*.

  Country Energy has proposed a price path (such as CPI-X) established for the remaining years of the *regulatory control period*

- *RNSP*s will not be required to provide a separate proposal on the WACC for public lighting services. *RNSP*s may propose the same WACC as applied to *standard control services*.

  Country Energy has not provided proposed a separate proposal on the WACC for public lighting services. Country Energy proposes to use the same WACC as applied to *standard control services*.

- *RNSP*s may propose reasonable simplifying assumptions within the building block model. In particular, the *AER* will accept the present depreciation assumptions applied by *RNSP*s.

  Country Energy has proposed a reasonable simplifying assumption in the building block model – that assets are perpetually half way through their useful life.

- *RNSP*s may base their opening asset valuation for existing public lighting assets on the existing asset valuation, with any efficient adjustments for capital expenditure and depreciation in the *current regulatory control period*.

  Country Energy has not applied an asset valuation for the composite asset base in determining prices. Capital expenditure and depreciation for the 2004 to 2009 *regulatory period* do not impact the determination of prices under the 'half life' based price cap approach.

Country Energy is therefore of the view that its proposed approach does not represent a departure from the *AER*'s likely approach.

11.6.1 Reasons Justifying Departure

Country Energy reiterates some of the key reasons underpinning its proposed approach, which the *AER* may consider as the reasons for justifying any departure from its likely approach.

- *Sending correct price signals to customers*

  Country Energy's proposed approach sends the correct price signals to customers based on the cost of providing the public lighting service. This is important as it is customers who drive the investment decisions. Cost reflective pricing will ensure that customers can make informed investment decisions in the provision of public lighting services.

- *Managing price impacts*

  Country Energy's proposed approach allows it to manage customer impacts through the rebate mechanism discussed above. This will ensure that no customer is subject to inappropriate price increases on moving to cost reflective tariffs.

- *Levelised tariffs over the life of the assets*

  Country Energy's proposed approach allows tariffs to remain level and predictable each year, without having to calculate different tariffs for each asset's age. It should be recognised that this method does not allow Country Energy to earn a return on and of its invested capital.

11.7 Service level information

Country Energy has adopted the minimum standards and guaranteed service level of the NSW Public Lighting Code in formulating the total costs in this *regulatory proposal*. A copy of the NSW Public Lighting Code can be obtained from DWE and a copy of AS1158 can be obtained from Standards Australia. In summary, key maintenance requirements of the NSW Public Lighting Code are that the maintenance program must include are as follows:

- Outage detection and service availability requirements
- Lamp replacement and disposal
- Luminaire cleaning and inspection
- Vegetation management strategies, including informing customers of their responsibilities
- Inspection, test, repair, and replacement of equipment
- Condition monitoring
- Maintenance recording and performance review, and
- Modifications of maintenance program as required.

Country Energy's approach to each of these items is summarised in its Street Lighting Management Plan, available on Country Energy's website.

11.7.1 Delivering Required Levels of Service Outlined in the Public Lighting Code

As discussed more fully in the Street Lighting Management Plan, for each of the required service levels under the NSW Public Lighting Code, Country Energy has implemented initiatives in the following areas:

- Outage detection and service availability requirements;
  - 24-hour call centre and resident education about outage reporting mechanisms
  - Night patrols for main roads
- Lamp replacement and disposal;
  - Spot outage lamp replacement
  - Bulk lamp replacement[13]
  - Lamp recycling
- Luminaire cleaning and inspection;
  - Luminaire cleaning and inspection as part of the progressive introduction of bulk lamp replacement programs
  - Ingress protection
- Vegetation management strategies, including informing customers of their responsibilities;
  - Safety and maintenance-related vegetation management
  - Light distribution-related vegetation management
- Inspection, test, repair, and replacement of equipment;
  - Associated equipment inspection and maintenance
- Condition monitoring;
  - Improved maintenance recording and analysis

[13] Country Energy's public lighting proposal reflects a bulk replacement program, a systematic replacement of every street light lamp over a period based on the manufacturers' data of lamp mortality and lamp lumen depreciation. For Country Energy, most of the lamp population will be replaced on a 3 year cycle, with twin arc sodium lamps on a 5 year cycle.

- Maintenance recording and performance review;
  - Country Energy is instituting a program by which all street lighting maintenance will be recorded in Country Energy's asset management system to deliver continuous improvements in inventory recording and condition monitoring.
- Modifications of maintenance program as required.
  - To achieve the objective of continuous improvement in the management of street lighting maintenance, maintenance data, customer feedback and technology developments will be regularly reviewed by Country Energy and the management plan will be updated accordingly.

11.7.2 Divergence from the NSW Public Lighting Code service levels

As discussed above, Country Energy has in place initiatives to meet the key maintenance requirements of the NSW Public Lighting Code.

11.7.3 Procedures for mediating disputes

The *AER*'s guideline on *alternate control service* requests that information be provided regarding procedures for mediating disputes and remedies where service levels have not been met.

Country Energy proposes to use its existing dispute resolution process as outlined in CEPG2042 Procedural Guideline: Customer Complaint Handling.

11.8 Expenditures

Country Energy provides the following information in compliance with Section 2.4.6(a)(2) of the *regulatory information notice*. It should be noted, however, that capital and operating expenditures do not drive changes in the prices for public lighting services, as these are driven by the current cost of providing the service, and the 'half life' approach to pricing.

11.8.1 Historic capital and operational expenditure requirements

Capital expenditure (nominal) is reported net of capital contributions for the *current regulatory period*:

Year	2004-05	2005-06	2006-07	2007-08	2008-09
Value ($M)	1.6	0	2.0	2.4	1.8

Operational expenditure (nominal) for the *current regulatory period*:

Year	2004-05	2005-06	2006-07	2007-08	2008-09
Value ($M)	7.6	7.1	7.7	8.8	12.9

11.8.2 Forecast capital and operational expenditure requirements

Capital expenditure ($ 2008-09) is reported net of capital contributions for the *next regulatory period*:

Year	2009-10	2010-11	2011-12	2012-13	2013-14
Value ($M)	1.9	1.9	2.0	2.1	2.1

Operational expenditure ($ 2008-09) for the *next regulatory period*:

Year	2009-10	2010-11	2011-12	2012-13	2013-14
Value ($M)	13.0	13.5	14.1	14.8	16.6

11.8.3 Material differences between historic and forecast expenditures

The step change in the operating expenditure for 2008-09 is due to the commencement of the bulk replacement program, approximately 48,000 lamps to be changed costing an additional $3 m. As this is the first year of bulk replacement program, the full benefit will not be realised and there is still an allocation for a high rate of spot maintenance.

11.9 Pricing proposal

11.9.1 Schedule of prices for the first year

The proposed prices published in Appendix K (public) are cost reflective prices to become effective from 1 July 2009.

11.9.2 Proposed price path

Country Energy proposes to publish cost reflective prices for the first year of the 2009 to 2014 *regulatory period*. Therefore, it is not necessary to provide a transitional path for these prices. Country Energy proposes to adjust these prices annually in line with the inflation and escalation rates allowed in the general network *determination* process for underlying cost increases.

The public lighting cost reflective prices are established with reference to 2007-08 costs. To the extent that the outturn real cost of labour and other inputs grows faster than the CPI over the 2009 to 2014 *regulatory period*, the current cost reflective prices will under estimate the costs of providing the public lighting service.[14]

As SLUOS costs are determined at a single point in time, it will be necessary to use a different methodology to allow for these underlying real increases in costs. In the absence of a mechanism to track real cost increases, Country Energy proposes to escalate the published cost reflective public lighting prices in line with the expected real increases in the cost of providing the service.

As the vast majority of public lighting costs are driven by the cost of labour[15], Country Energy proposes to escalate the published public lighting prices by the annual increase in electricity, gas and water labour costs as a proxy for the underlying real cost increases. This will provide certainty and stability to public lighting customers over the course of the *regulatory period*.

[14] Under the simplified form of regulation, there is no mechanism under which Country Energy can track the underlying costs of providing the public lighting service and reflect these cost changes in prices. For the network business, a revenue requirement is determined for each year of the *regulatory period*, and any underlying increases in labour and materials above normal inflation can be reflected in that annual revenue requirement. This allows network tariffs to follow a CPI-based price path.

[15] Even for capital components, the cost of a public lighting assembly is dominated by the labour costs associated with its installation.

Consistent with a price cap form of regulation, total public lighting revenues will increase or decrease in line with greater or lesser deployment of public lighting installations. As this deployment is largely at the request of customers, the price cap form of regulation aligns with the incentives provided to both Country Energy and its public lighting customers.

11.9.3 Indicative Prices for each year of the next Regulatory Period

As discussed above, it is not necessary to provide indicative prices beyond real cost escalation information. Published prices in future years will be the first year cost reflective prices, escalated by a real cost increase index each year. Any new assets will be charged at the published cost reflective prices. In this way, any historical subsidies will be quarantined to the assets in service as at the inventory date, and those subsidies will be unwound through the erosion of the rebate.

During the *next regulatory control period*, prices for new lights that are not on the published list will have SLUOS charges determined as per CEPG2154 - SLUOS Pricing Methodology. Country Energy has provided customer numbers, revenue and network prices (both actual and indicative) rolled up to a customer class level for *alternate control services* in *regulatory information notice* Pro forma 2.2.5 table 2. A full set of forecast revenue, customer numbers and prices at tariff level are provided in the PTRM within the forecast revenue worksheet supplied with the *regulatory proposal*.

11.10 *AER* decision factors

In deciding which of these control mechanisms is appropriate for public lighting services, the *AER* must have regard to the provisions of clause 6.2.5(d) of the transitional *Rules*. Country Energy has addressed these decision factors below.

- *The potential for development of competition in the relevant market and how the control mechanism might influence that potential*

  The principal followed by Country Energy in interpreting the contestability framework in NSW is that it is only the owner of the lighting that can maintain, modify or remove street lights or arrange for another party to maintain, modify or remove them.

  To the extent to which prices are cost reflective (and not subsidised by the network) the appeal of the business (either ownership or maintenance services) to a new entrant will be higher.

- *The possible effects of the control mechanism on administrative costs of the AER, the RNSP and users or potential users*

  Once approved, the schedule of fixed prices need only be adjusted by the inflation and escalation rates allowed for *standard control services*, sharply reducing the administrative burden on the *RNSP* and the *AER*.

- *The regulatory arrangements (if any) applicable to the relevant service immediately before the commencement of the distribution determination*

  The proposed arrangements are consistent with the IPART approach in that the prices reflect the economic cost of providing the service. Consistent with the IPART approach, Country Energy's proposed methodology does not rely on a roll forward of a historical asset base, but rather focuses on reflecting the cost of providing the service.

- *The desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction)*

  Country Energy understands other NSW *RNSPs* apply similar methodologies. Country Energy also considers that this mechanism is easily applicable to any jurisdiction.

Glossary

12 Glossary

ABC	Aerial Bundled Conductor
ACCC	Australian Competition and Consumer Commission
AER	*Australian Energy Regulator*
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
bppa	basis points per annum
CCTV	Closed Circuit Television
CEG	Competition Economists Group
CIS	Customer Information System
CPI	Consumer Price Index
DGA	Dissolved Gas Analysis
DSA	Distribution System Automation
EBSS	Efficiency Benefit Sharing Scheme
EDDiS	Electricity Metering Data Distribution System
EMF	Electric and Magnetic Field
EPA	Environmental Protection Authority
ESDR	Electricity System Development Review
EWON	Energy and Water Ombudsman of New South Wales
EWP	Elevated Work Platform
GDP	Growth Domestic Product
GIS	Geographical Information System
GRP	Gross Regional Product
GSP	Gross State Product
ICT	Information Communication Technology
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
LGA	Local Government Area
MCE	Ministerial Council on Energy
NAMP	Networks Asset Management Plan 2008-09 to 2013-14

NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NIEIR	National Institute of Economic and Industry Research
NSC	National Standards Commission
NSW	New South Wales
ODRC	Optimised Depreciated Replacement Cost
PB	Parsons Brinckerhoff Australia Proprietary Limited
PCB	Polychlorinated Biphenyls
PMO	Program Management Office
PPM	Parts Per Million
PoE	Probability of Exceedence
PTRM	Post Tax Revenue Model
QCA	Queensland Competition Authority
RAB	Regulatory Asset Base
RFM	Roll Forward Model
RNSP	*Regulated Network Service Provider*
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SF6	Sulphur Hexafluoride 6
SKM	Sinclair Knight Merz
SLUOS	Street Lighting Use of System
STPIS	Service Target Performance Incentive Scheme
SWER	Single Wire Earth Return
TAM	Total Asset Management
TOU	Time of Use
WACC	Weighted Average Cost of Capital
WAPC	Weighted Average Price Cap

Appendices

13 Appendices

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