Network Management Plan

PART A

ELECTRICITY SUPPLY FOR REGIONAL QUEENSLAND

2004
2010

ERGON ENERGY

CONTENTS

1. INTRODUCTION

This is Ergon Energy's inaugural Network Management Plan. Ergon Energy welcomes the opportunity to share with all of Ergon Energy's stakeholders this insight into the challenges and responses of the organisation, as well as the increased transparency of network management and operations which the publication of this Network Management Plan provides.

Ergon Energy is acutely aware of how important a high standard of electricity supply is to the continued economic growth, prosperity and lifestyle of regional Queensland and, to that end, is committed to the maintenance and continued development of a supply network which fulfils that requirement.

This Network Management Plan is an expression of that commitment. It also represents a major part of Ergon Energy's public commitment to the implementation of the recommendations from the recent State Government initiated review into the industry – *Electricity Distribution and Service Delivery for the 21st Century.* The Plan also supports Ergon Energy's performance commitments, as a Government Owned Corporation, to its shareholding Ministers, as expressed in the corporation's Statement of Corporate Intent.

Ergon Energy's Network Management Plan is focused on the delivery of a safe, high quality, reliable and economic electricity supply to regional Queensland.

The Plan, based on asset management strategies and operational plans, details our commitments on network reliability, capacity and supply security.

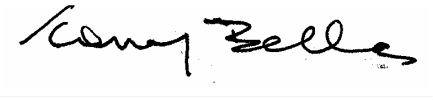
The key features of the Plan include:

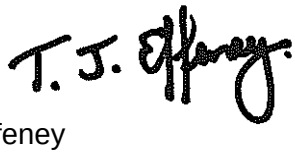
- a substantial improvement of over 25% in overall reliability performance over the next five years.
- improved security of the network with new world-class planning criteria currently being implemented across all key network assets.
- a significant increase in available capacity, including the construction of up to five new bulk supply points and 28 zone substations, which will support the continued economic growth and prosperity of regional Queensland.
- a $2.9 billion capital expenditure commitment over the next five years. This massive investment is on top of record expenditure over the past four years, and is in response to the need to both renew an ageing network and to develop infrastructure appropriate to the needs of a growing and technologically sophisticated community.
- a substantial workforce increase, as well as data and system improvements.

We believe that the implementation of the Plan will constitute a major step towards Ergon Energy's vision to be 'a world-class, customer-driven energy business'.

In accordance with the requirements of the Electricity Industry Code, we hereby certify that:

- this Network Management Plan meets Ergon Energy's obligations under its distribution authority
- the Plan accurately represents the relevant policies of Ergon Energy
- Ergon Energy has complied with those policies and/or provides details of where it has not complied herein
- Ergon Energy is committed to implementing this Network Management Plan.





Tony Bellas
CHIEF EXECUTIVE

Terry Effeney
EXECUTIVE GENERAL MANAGER DISTRIBUTION

2. OVERVIEW

In July 2004 an independent panel, commissioned by the Queensland Government to conduct an inquiry into electricity distribution in Queensland, handed down its report entitled *Electricity Distribution and Service Delivery for the 21st Century* (EDSD). The Government approved all of the EDSD Report's recommendations, which included a total of 24 involving Ergon Energy, all of which Ergon Energy has committed to implement.

Ergon Energy had made a number of submissions to the inquiry, including a recommendation that a network capability plan (similar to those produced in NSW and by Powerlink) be published annually. This was included in the EDSD Report's recommendations as a Network Management Plan, to be published in a format suitable for communication to external stakeholders. This requirement has since been incorporated into the Electricity Industry Code.

This document, comprising Ergon Energy's first public annual Network Management Plan, addresses the key issues raised in the EDSD Report, including:

- customer connections
- network security
- load growth and demand management
- reliability of supply
- maintenance and management of aged assets
- safety and community amenity
- opportunities for public consultation.

In this instance, the Plan is being published in two parts, Part A and Part B, detailed below:

Part A – Electricity Supply for Regional Queensland

Published in December 2004, this document provides:

- background information
- details of operating environment, including load forecasts
- key challenges facing the corporation relating to the management of the supply network
- policies and strategies underpinning its management
- high level overviews of network capacity, reliability and maintenance
- a summary of committed major projects
- details of Summer Preparedness Plans.

Part B - Network Capability and Planning Report

To be published in July 2005, providing detailed:

- network capacity information and load forecasts
- identification of network limitations
- augmentation works scheduled to undergo regulatory test/public consultation
- analysis, options and potential projects
- opportunities for non-network solutions
- feeder performance report
- performance improvement plans.

Part B is also intended to facilitate a process for public consultation and stakeholder feedback on network constraints, supply issues and proposed solutions and thereby promote awareness of potential investment opportunities which may be cost effective in avoiding or postponing network expansion.

Note: All Information provided is based on the data available at the time of compilation. In addition, the final expenditure programs will be subject to a regulatory determination by the QCA and agreement by Ergon Energy's shareholdong Ministers and, where applicable, to Board approval. Further, specific projects/works contemplated in this document, unless expressly stated as already being 'committted', represent Ergon Energy's intention. Commitment to these projects/works remains subject to appropriate internal and external approvals and specific detailed review at the time.

3. BACKGROUND

3.1. Profile

Ergon Energy manages over $3 billion worth of regulated and non-regulated electricity distribution assets over one million square kilometres of regional Queensland. Ergon Energy's service area effectively covers 97% of the state - equivalent to most of the eastern seaboard of the US - this represents one of the largest and most diverse infrastructure networks in the western world.

The critical difference between Ergon Energy and other Distribution Network Service Providers (DNSPs) is that its length of line is spread over this vast territory. Ergon Energy has the distinction of having the lowest customer density of any network in the western world for the 100,000km of line west of the Great Dividing Range. The cost to supply low-density areas is higher than urban areas because of the greater lengths of line required per customer. Servicing such a network over a large territory requires more resources per customer, resulting in higher relative maintenance costs.

The breakup of the customer numbers into supply categories defined by the industry's economic Regulator, the Queensland Competition Authoritys (QCA), is outlined below.

QCA Categories	Customer Numbers
Urban	237,509
Short Rural	266,212
Long Rural (Remote)	66,535

Ergon Energy also manages 33 isolated generation stations and stand-alone distribution networks in the remote areas of western and northern Queensland. Ergon Energy is a world leader in the provision of Stand-alone Power Supply (SPS) solutions for remote properties and Government services.

The vast geographical spread has a number of impacts on the performance of the distribution system. There is an extensive list of geographic and related environmental features, including areas:

- of high probability of and high exposure to cyclones
- of high storm and lightning activity
- of significant termite populations affecting power pole integrity
- impacted by weather in other ways (eg. the Channel Country flooded by rains hundreds of kilometres away)
- of unstable soil types (eg. Darling Downs)
- with significant summer-winter and day-night temperature variations.

These geographic and related environmental variations influence the design criteria for infrastructure, as well as the ability to respond to incidents on the distribution system. The low load density and geographical spread also impact on network topography with much of the subtransmission and distribution network being characterised by long radial lines.

To assist in understanding the terminology in this Plan, Appendix 9.1 provides a diagram of the role of distribution in the supply of electricity to customers, as well as definitions for terms used for key elements of the network. Further background information can be found in the final report from the Queensland Government independent review of electricity distribution in Queensland – entitled *'Electricity Distribution and Service Delivery for the 21st Century'* (EDSD) available online at www.energy.qld.gov.au

The map below shows the Ergon Energy distribution service area, including the locations of the 33 isolated community generation sites and the stand-alone power supply systems located in Queensland. The spread of Ergon Energy's main network is dominated by the western system, as can be seen in by the olive green shading. This, and the radial nature of the subtransmission and rural distribution networks, is further illustrated in Appendix 9.2.

Ergon Energy's asset base comprises:

- distribution and subtransmission lines - approx 150,000km
- zone substations - around 600 sites, 300 large substations
- power transformers - 600, from 5MVA - 80MVA, 33kV to 132kV
- protection relays - approx 1,900 and 2,400 radio units
- zone substation switchgear - 6,900
- instrument transformers - 5,000
- distribution poles - 900,000
- pole tops - over 1,200,000 crossarms
- overhead services - 540,000
- underground cables - 2,900km
- distribution transformers - 80,000
- distribution switches - 12,000
- revenue meters - 1,200,000
- ripple receivers - 380,000
- public lighting - 110,000
- isolated power stations - 33 communities.

3.2. History

Electricity supply in Queensland was initially developed by local authorities. These were merged to form regional electricity boards, which ultimately merged to form Ergon Energy.

In many ways this parallels the development of electricity networks around the world where greater economies of scale were sought through expansion and mergers.

The expansion of electricity networks in Australia in the second half of the 20th century is considered one of the great modern feats of engineering - 60 years ago there were virtually no regional electricity networks in Queensland.

An inevitable feature of the expansion during this time has been that the larger industrial loads and higher density areas (usually urban coastal) have tended to be served by more reliable systems, whereas network expansion into the lower density rural areas has tended to be rolled out at minimal cost per connection. These cost constraints are reflected in the type of construction and network structure used at the time, typical of which was the low cost Single Wire Earth Return (SWER) technology used to span long distances.

The philosophy used to initially extend Queensland's rural distribution system during the late 1950s through to the early 1980s, such as extremely long lines and SWER systems, was based on meeting simple needs of lighting, basic refrigeration and general power for equipment like jugs, toasters and pumps.

The ensuing decades, in particular the last five to ten years, have seen a fundamental shift in the end usage patterns to include larger loads (air conditioning and increased refrigeration) and highly sophisticated and complex equipment (computers and facsimile machines). Over the same period, there has been a fundamental shift in both customer expectations and awareness of the quality of supply, in part because of the sensitivity of the new equipment. However, today's distribution system is still largely based on technologies and end usage patterns of earlier decades.

3.3. Achievements

Since Ergon Energy's creation in 1999, it has brought together six disparate network corporations with different processes, standards, data systems, customer bases and cultures.

In its first five years, the corporation's focus has been on laying a solid foundation for significant business change, implementing standard processes, addressing the immediate issues (safety, defects and network performance), taking management control and, to a lesser extent, pursuing growth opportunities.

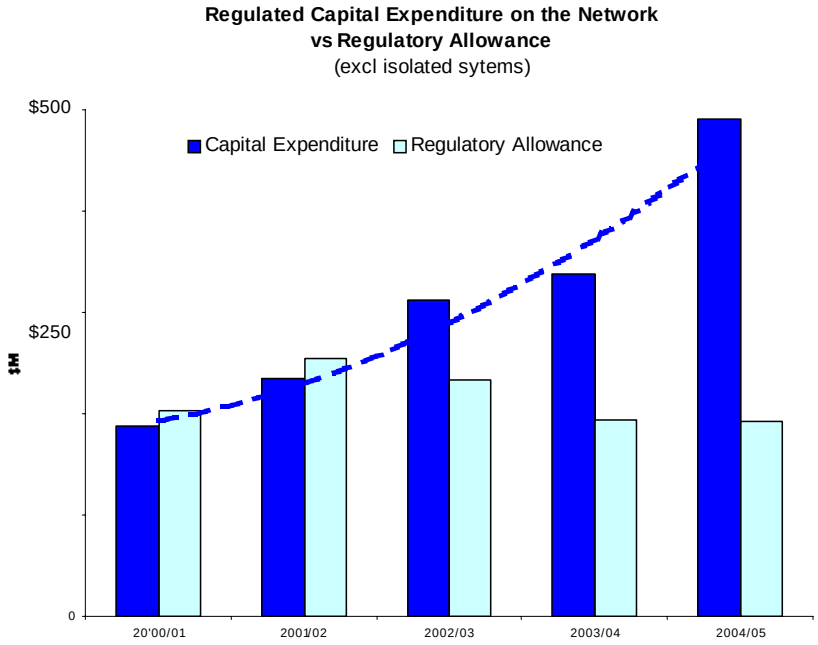
Ergon Energy has been very successful in this journey in what has been a very difficult and complex environment. Key achievements to date have included:

Workplace Safety – Ergon Energy was awarded the five-star National Safety Council of Australia (NSCA) grading in April 2004 - the highest grading possible - providing independent recognition of the quality of its Health and Safety Management System and safety performance.

Network Performance – record capital and maintenance expenditure programs are continuing to be deployed to address the quality and reliability of electricity supplies across regional Queensland. The record levels of investment to date have included the roll out of a benchmark Asset Inspection and Defect Management (AIDM) program and the completion of an accelerated three-year network inspection cycle targeted for August 2005. Network data collected in this process is enabling Ergon Energy to fully utilise the state of the art asset management systems now in place.

The network improvement program is continuing, with this financial year's record $700 million capital works, maintenance and operations program delivering substantially improved network capacity, reliability and storm resilience.

The following graph shows the uplift in capital expenditure from 2000/01 and demonstrates Ergon Energy's commitment to addressing network related issues.



Customer Service – New system capability, the establishment of an internal customer advocate, improved fault management and proactive customer communications, as well as success with a customer partnering approach, are supporting customer service improvements across the business. These achievements are reflected in research showing Ergon Energy leading a pool of other Australian energy suppliers in a range of customer value measures.

Financial Performance – Ergon Energy has achieved all of its financial targets while balancing the need to invest in the network.

Staff Satisfaction – the success achieved in managing the merger of the predecessor corporations in a decentralised and culturally diverse business, with a policy of no forced redundancies or relocations, is highlighted by a stable overall employee satisfaction level of 65%.

Business and Systems Integration – the merger required the development and integration of new business processes and asset management systems, providing the foundations for improved efficiency and customer service into the future.

Environment – Ergon Energy is maintaining certification to the international Environmental Management System standard ISO 14001. The regular audit by NATA Certification Services International (NCSI) is showing progressive improvements in environmental performance across the organisation.

Additional information regarding Ergon Energy's achievements is contained in the corporation's Annual Report 2003/04, which can be accessed online at www.ergon.com.au/annualreport

4. OPERATING ENVIRONMENT

4.1. Core Business

Ergon Energy Corporation Limited (referred to as Ergon Energy) is wholly owned by the Queensland Government. The core business of the corporation is to operate as a distribution entity under the Electricity Act 1994.

Its principal functions are to operate, maintain (including repair and replace), develop and protect its electricity supply network to ensure the adequate, economic and safe supply of electricity to its customers.

Energy is supplied into Ergon Energy's network through 46 connection points with the Transmission Network Service Provider for Queensland, Powerlink Queensland, and from a small number of embedded generators.

As holder of a Distribution Authority, Ergon Energy has an obligation to provide access to customers within its region to connect their electrical installations to the supply network under non-discriminatory terms. It must transport electricity over its network to meet customer requirements. The Distribution Authority is available online at www.energy.qld.gov.au/electricity/licensing.html

Ergon Energy also provides high voltage and project management services to internal and external customers.

In addition to the core distribution business, Ergon Energy is a 100% shareholder in Ergon Energy Pty Ltd, a Queensland based national electricity retailer operating across the eastern seaboard of Australia. Reference to Ergon Energy Pty Ltd in this document is minimal.

4.2. Industry Regulation and Obligations

Ergon Energy is governed by the provisions of the Corporations Act 2001, except as otherwise provided by the Government Owned Corporations Act 1993. The regulatory framework in which Ergon Energy operates is administered by the Queensland Department of Energy.

The Department of Energy is responsible for delivering the Government's energy agenda to key stakeholders and, with particular relevance to Ergon Energy's Network Management Plan:

- monitoring and improving the operating performance of the electricity industry
- providing an efficient regulatory and licensing regime for the electricity industry
- providing a complaints and dispute resolution service between energy customers and suppliers.

The primary legislation governing Ergon Energy's activities is the Electricity Act 1994 and the Electricity Regulation 1994. This legislation covers:

- licencing and licence compliance
- recommendations on standards and practices under the Act
- settlement of disputes
- approval of standard customer contracts
- approval of electricity prices for non-contestable customers
- administration of electricity restrictions / rationing procedures
- retail competition/contestability.

Many of these matters are statutory functions of the Regulator, who for the purposes of the Electricity Act is the Director-General, Department of Energy. The Department of Energy administers all of these matters, including the statutory functions of the Regulator.

Under the Act, the Regulator has the authority to implement an Electricity Industry Code. This is supported by an Electricity Amendent Bill recently enacted by Queensland Parliament and prescribes requirements relating to industry planning, reporting and service standards.

Electrical safety matters, including licensing of electrical workers and contractors, are dealt with under the Electrical Safety Act 2002 and administered by the Electrical Safety Office (ESO) within the Department of Industrial Relations. The Electrical Safety Act 2002 establishes the legislative framework for electrical safety regulation in Queensland and provides for a consultative framework for industry, workers and the community.

The new Integrated Planning Act, which seeks to achieve ecological sustainability in relation to local, regional and state development, has the potential to have a significant impact on the development of the electricity network. Under this Act, construction of new electricity infrastructure will generally require a full impact assessment involving an increasing level of public consultation and negotiation.

The Electricity - National Scheme (Queensland) Act 1997 (National Scheme Act) governs Queensland's participation in the National Electricity Market. This Act also applies the National Electricity Code (NEC) to the National Electricity Market in Queensland.

The NEC sets limits for the interconnected electricity supply systems in Queensland. Under the NEC, the National Electricity Market Management Company (NEMMCO) administers and manages the market for both physical power dispatch and financial settlements. As the market operator, NEMMCO has responsibility for power system security. Under some abnormal system conditions, NEMMCO can require automatic load shedding to manage system security.

To enable NEMMCO to maintain power system security, as a Distribution Network Service Provider (DNSP), Ergon Energy must take all steps necessary to ensure that up to 60% of the power systems load at any time will be available for disconnection by one or more of the following means:

- under the control of under-frequency relays
- under manual or automatic control from control centres or by distribution system control centres
- under the control of under-voltage relays.

Disconnection policies are established with Powerlink as the jurisdictional coordinator in consultation with the Department of Energy. As a registered DNSP under the NEC, Ergon Energy also an obligation to:

- ensure that its network is operated with sufficient capacity and augmented if necessary, to provide network services to customers
- ensure that its network complies with technical and reliability standards contained in the National Electricity Code and jurisdictional obligations
- provide relevant information to Powerlink as the Transmission Network Service Provider in the preparation of their Annual Planning Report
- develop recommendations to address emerging network limitations through joint planning with Powerlink and consultation with Code Participants and interested parties.

The regulatory environment imposes disciplines on Ergon Energy to ensure that its network is efficiently planned, constructed, operated and maintained, and that the corporation does not extract ‘monopoly rents’ for its regulated network operations.

The regulatory bodies who undertake economic regulation of the electricity transmission and distribution networks in accordance with the National Scheme Act and the NEC are:

- the Queensland Competition Authority (QCA), who has responsibility for price regulation of electricity distribution networks
- the Australian Competition and Consumer Commission who has responsibility for economic regulation (including pricing) of electricity transmission networks.

The QCA is currently considering submissions made by Ergon Energy in relation to its future revenue requirements and is about to produce a draft determination. The outcome of this determination will set Ergon Energy's regulated revenue cap for the coming period and, therefore, has the potential to impact on the implementation of this Network Management Plan.

Ergon Energy's isolated generation assets, comprising 33 power stations and associated distribution assets do not operate under the QCA regulatory framework. The applicable framework for the isolated generation assets is currently under negotiation with the Department of Energy and Treasury.

5. KEY CHALLENGES

Ergon Energy's challenges over the five-year planning horizon are characterised by factors which are common to the electricity supply industry in general, as well as factors which are a function of the corporation's unique history and geography.

5.1. Customer Connections

There has been a step increase in customer-initiated works in recent years, particularly commercial and industrial, and subdivisions.

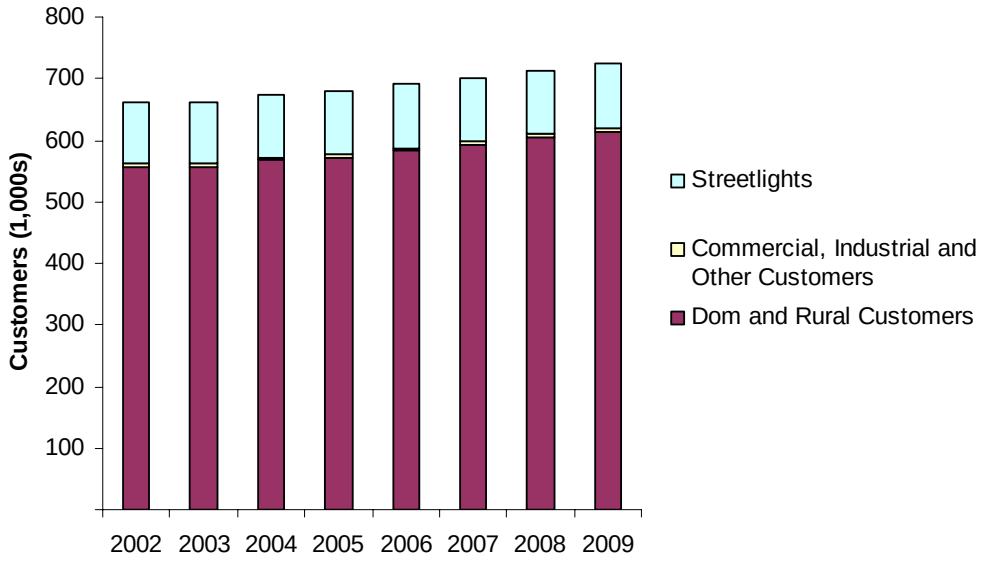
CUSTOMER-INITIATED WORKS	2000/01 Actual $, 000	2001/02 Actual $,000	2002/03 Actual $,000	2003/04 Actual $,000	2004/05 Budget $,000
- Commercial & Industrial	18,636	29,794	40,243	59,709	40,485
- Domestic & Rural	16,588	15,538	20,872	24,085	20,225
- Sub Divisions	7,377	11,179	19,027	37,353	37,394
- Public Lighting	3,417	3,274	2,582	2,720	3,090
- Meter & Services	5,276	6,822	9,617	12,295	13,038
- Major Customer Projects	-	-	-	-	31,007
TOTAL	**51,294**	**66,607**	**92,341**	**136,162**	**145,238**

The difficulty of accurately forecasting the demand for new connections and the associated expenditure is discussed below.

5.1.1 Customer Numbers

Overall customer numbers have grown by around 2% pa over the last five years. This growth has been driven mainly by development in the coastal areas of Hervey Bay and Bargara, Capricorn Coast, Whitsunday, Townsville and Cairns, for which the long-term projected average population growth is up to 3% pa, reflecting the national demographic trend to seaside residential development. Areas in and around Toowoomba have also been growing at a higher rate than the national average.

Growth in customer numbers is expected to continue at about 2% pa, driven by the areas referred to above. The following graph shows recent and projected customer number growth across the whole Ergon Energy supply area.



Despite the growth trends indicated above, many of the rural shires within Ergon Energy's supply area are in fact experiencing falling populations. In fact almost 50% of the 111 Local Government areas which constitute Ergon Energy's area of supply are projected to experience very low or negative population growth, although this does not necessarily translate into falling electricity demand.

5.1.2 Connections for Domestic and Light Industrial/Commercial Customers

Based on forecast load growths for the various regions, which take into consideration such factors as building approvals, population growth trends etc, it is anticipated that the high level of customer connections will continue.

Summary	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Customers	505,453	515,344	520,396	530,578	540,961	551,547	562,341	573,350	584,576
Dom and Rural Cust	501,002	510,845	515,865	526,003	536,343	546,888	557,641	568,607	579,791
C&I and Other Customers	4,451	4,499	4,531	4,575	4,618	4,659	4,700	4,743	4,785
Streetlights	90,571	91,477	91,934	92,853	93,782	94,720	95,667	96,624	97,590

The primary drivers for customer capital expenditure will continue to be in subdivisions (approximately $48 million per year including meters and services) and major customers (approximately $45 million per year beyond 2005/06). It is to be noted that subdivision development in Ergon Energy's growth areas did not decline after the implementation of GST as was experienced in other parts of Australia.

Ergon Energy expects the level of activity in the commercial and industrial, domestic and rural and public lighting segments to remain around the same as experienced over the past couple of years.

5.1.3 Major Industrial and Mining Customers

The connection of major industrial and mining loads is a significant issue for Ergon Energy. While high levels of investment in this sector are expected to continue, the quantum and timing of such connections are difficult to predict, being subject to world commodity prices and other economic and public policy factors and influences.

Providing these connections can be particularly challenging in a decentralised and largely radial network, where the marginal cost of significant additional capacity varies widely with location. Many of the connections are located on resource fields remote from the coastal network and, therefore, require extending major network line assets.

In April 2004, Ergon Energy had over 100 potential major customer connection projects with a value estimated at over $200 million in some phase of development. These include potential projects, and associated works, relating to co-generation at sugar mills and dams, new coal mines, upgrades to existing coal mines and coal terminals, new hard rock mining load and generator connections.

Queensland is a major source of steaming and coking coal to world markets. Queensland is also a major source of metals (gold, copper, zinc, lead and aluminium) in terms of mining and processing. These key resources represent significant development opportunities for the state and if developed, would require significant additional energy supplies. There are also significant opportunities for renewable or Green energy projects.

There are major difficulties for Ergon Energy, including multiple variables beyond our control, in the forecasting of growth in the major customer segment, including:

- the combination of volatile market environments with the long lead time of some major customer connections makes it difficult to predict the timing and magnitude of the load that will be required to be supplied from the transmission and distribution systems.
- timing of project starts is a major concern. A number of projects, particularly in the mining sector have been on the drawing board for a considerable time but many new projects in the coal sector crystallised relatively quickly, prompted by the growing

economy of China and its demand for energy. Similarly, buoyant conditions in the metals industry are bringing projects on line.

- economic decline reduces demand for products. A down turn in the economy of the purchasing country will see other new projects shelved or existing projects closed down.
- life of project verses asset life. Many of the projects have a life well short of the life of the assets required to provide the supply. For example, typically gold mines have a life of about 10 years and coal mines around 20 years. Yet both place significant demand on the distribution system in terms of the infrastructure required to supply their operational needs.
- renewable energy production opportunities or sources tend to be remote from major network infrastructure. For example, wind generation projects such as the projects proposed in the Toowoomba area and in Far North Queensland will, if progressed, require significant investment in infrastructure to take the energy.

5.2. Network Capacity and Security

5.2.1 Load Growth Versus Capacity and Security

One of the key recommendations being adopted from the EDSD Report is to move to a slightly lower level of risk in relation to the security levels applied in planning the supply network. The Report also recommended that consideration be given to adopting less conservative (ie. higher) load forecasting assumptions for planning in critical areas.

These recommendations have required a review of Ergon Energy's application of planning criteria, as well as a review of the existing network capacity and forecast demand in order to assess implications and identify potential changes to existing augmentation programs.

Electricity supply networks are normally designed and built with spare capacity sufficient to accommodate several years of load growth without the need to upgrade. 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.

Given the relatively long lead times for major electrical infrastructure projects, accurately predicting future loads is a challenge of critical importance.

In this regard it is important to note that Maximum (or peak) Demand[1] rather than energy consumption is the key issue with regard to network capacity, particularly where, as in Ergon Energy's case, the annual load factors are decreasing over time. Peak demand is, however, a volatile parameter and increasingly difficult to predict accurately, as described below.

Apart from new customer connections as outlined in Section 5.1 above, two of the key peak demand drivers in Ergon Energy are the take up rate of air conditioning and the possiblility of future climate change.

5.2.2 Climate Effects

If the climate changes predicted by many specialists are to be accepted, increased average temperatures, decreased average rainfall and increasingly volatile weather are likely to impact on Queensland in forthcoming years. In particular, parts of Ergon Energy's supply area are considered to be especially sensitive to the effects of El Nino.

This has significant implications for Ergon Energy's load forecasts, given the increasing proportion of temperature sensitive load outlined below and the uncertainty of the effects on irrigation and associated electrical pumping loads in the highly significant and vulnerable agricultural sector.

[1] Engineers and economists have different understandings of 'demand'. For engineers, demand represents the peak rate of using energy measured as MW or MVA. Demand for economists represents the quantity of any good or service required by customers as featured by supply and demand curves. In this document, demand relates to the engineering sense.

Ergon Energy's demand forecasts are prepared for a 50th percentile temperature condition (ie. the temperature that can be expected to be exceeded once every two years). Temperature probabilities are of necessity based on historical recordings and do not include any allowance for forecast increases in average (and maximum) temperatures.

The use of 10% Probability of Exceedance (POE) forecasts is one way of managing the risk associated with increasingly unpredictable temperatures. The EDSD Report recommended consideration of this for critical areas. While this matter is still being investigated in detail, the impact of using 10% POE forecasts would be to increase the forecast Maximum Demands used for planning purposes by up to 6%.

5.2.3 Air Conditioning

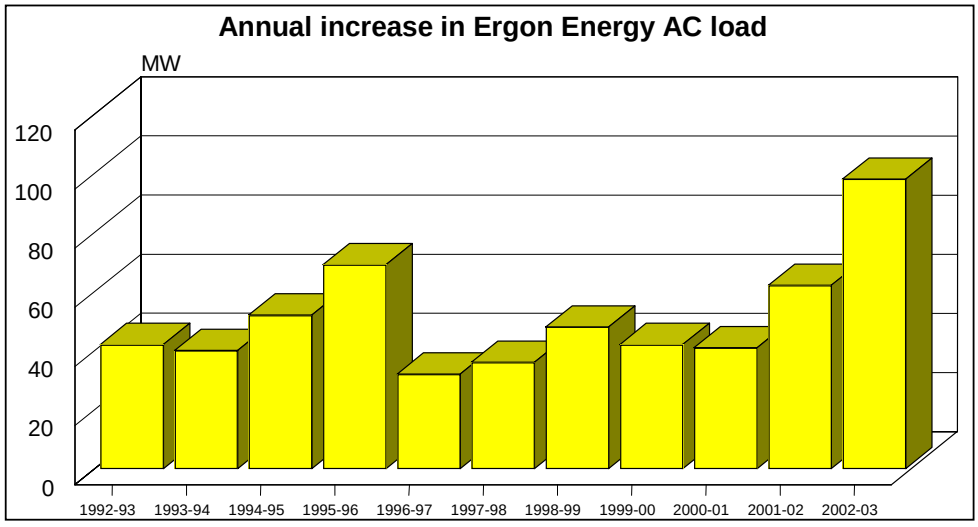
Ergon Energy's load is on the whole, summer peaking with most of the network serving tropical and sub-tropical areas. The pre-existing incidence of air conditioning load is believed to be generally higher than in South East Queensland, resulting in the effects of recent penetration increases being not quite as severe as those seen in more temperate areas. In the southern states, high rates of air conditioning penetration have led to unexpectedly high summer demand peaks in networks designed for winter peaks where equipment ratings are higher and less limiting.

Nevertheless, Ergon Energy is not immune to this issue. A report commissioned from the National Institute of Economic and Industry Research (NIEIR) in November 2003 concluded that Ergon Energy's total temperature-sensitive load has increased by well over 100% to 1060MW in the last 10 years, which represents just over half of the total Maximum Demand. The Maximum Demand (MD) itself has increased by about 50% during the same period.

A recent (2004) customer survey involving 1,200 respondents (50% business and 50% residential, across all Ergon Energy's regions and all feeder types) produced the following key findings in relation to air conditioning:

- 70% of respondents have air conditioning of some kind
- approx 25% intend to install air conditioning (including additional) in the next year.

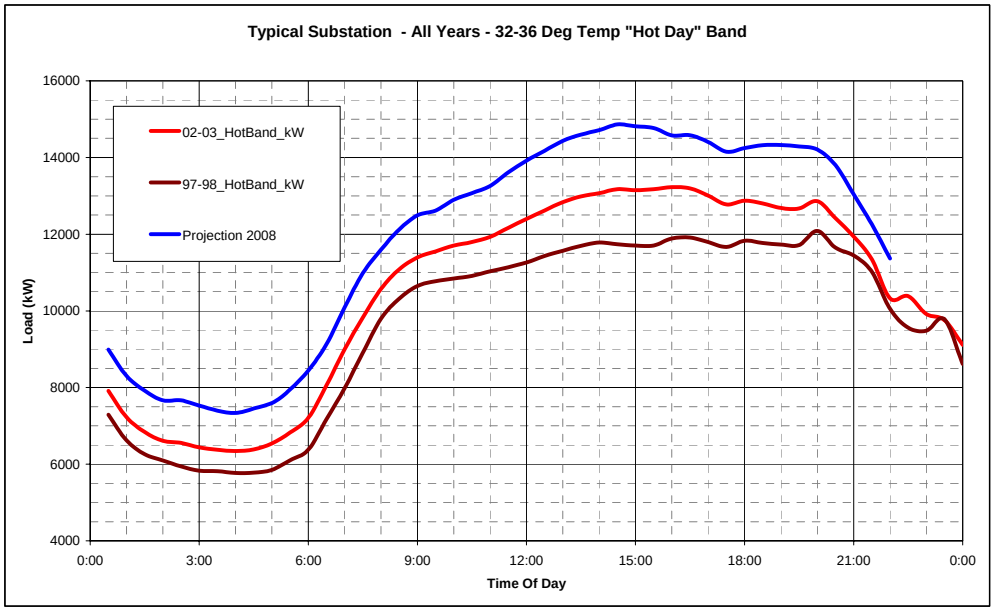
The figure below shows the annual increases in Ergon Energy's air conditioning load as estimated by the NIEIR.



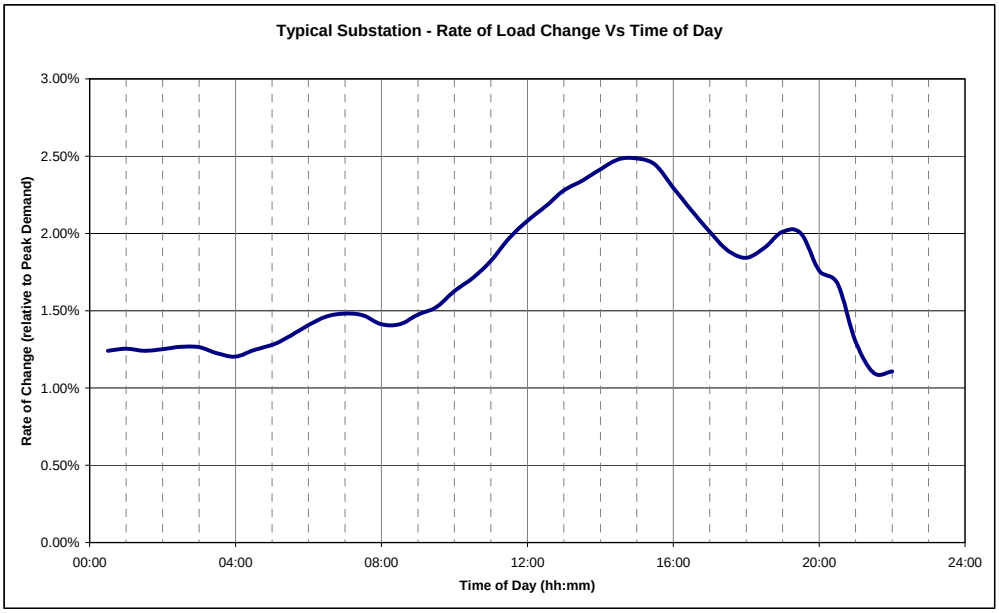
There has been a shift in recent years from evening to afternoon summer peaks at sites supplying significant population areas and these afternoon peaks are growing at a faster rate than the evening peaks. This is illustrated in the figures below produced from recordings at a typical zone substation, where, on hotter days, the load profiles of residential loads tend to 'fill out' and combine with the flatter profile of commercial and light industrial loads to produce an earlier time of peak.

Maximum Demand occurring around 2-2.30pm in the hottest part of summer, with a relatively flat load profile, results in severe stress on electrical infrastructure that effectively becomes derated, causing augmentation and reinforcement to be implemented earlier to prevent escalation of the risk of failure.

Combined with concern about climate change and the likelihood of severe summer temperatures, these changes serve to both increase the uncertainty of load forecasts and reduce the tolerance for error because of the lower capacity ratings of electrical equipment at higher ambient temperatures with flatter load profiles.



Summer Load Profiles – 1998-2003, and 2008



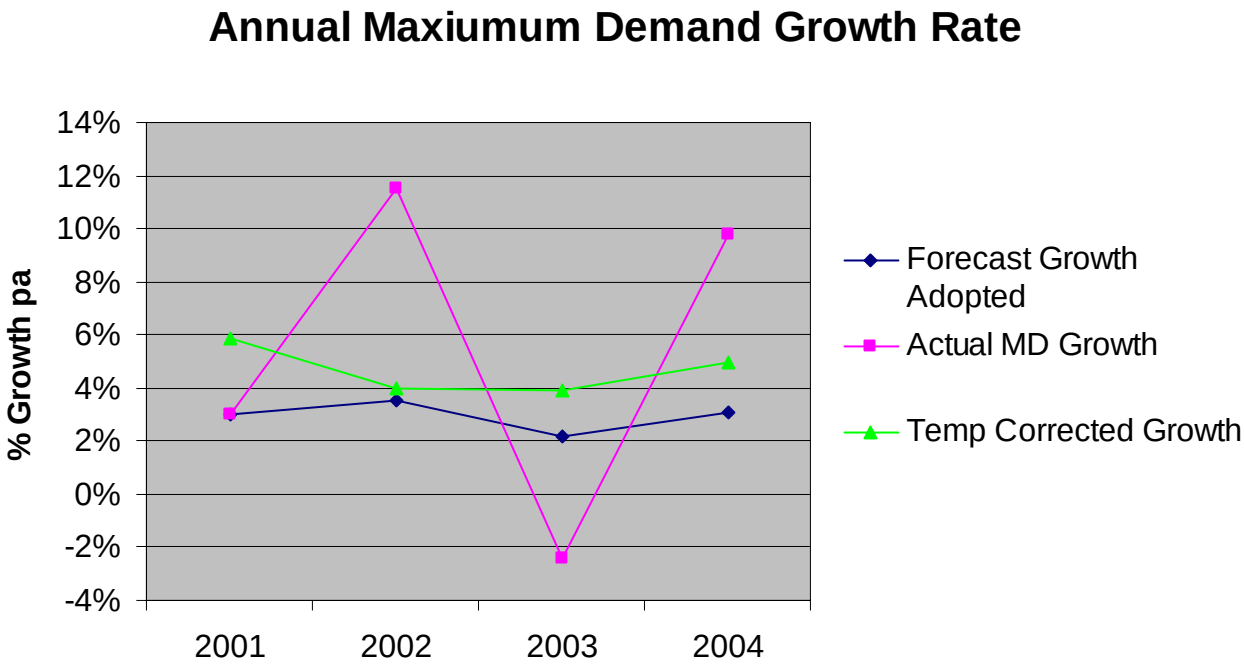
Rate of Annual Demand Growth Vs Time of Day

5.2.4 Load Forecasting Uncertainty

The demand growth rate forecast on which the QCA's last regulatory determination was based averaged 3% pa over the regulatory period. This compares with an actual average growth over this period of 5.4% pa (4.8% pa temperature corrected).

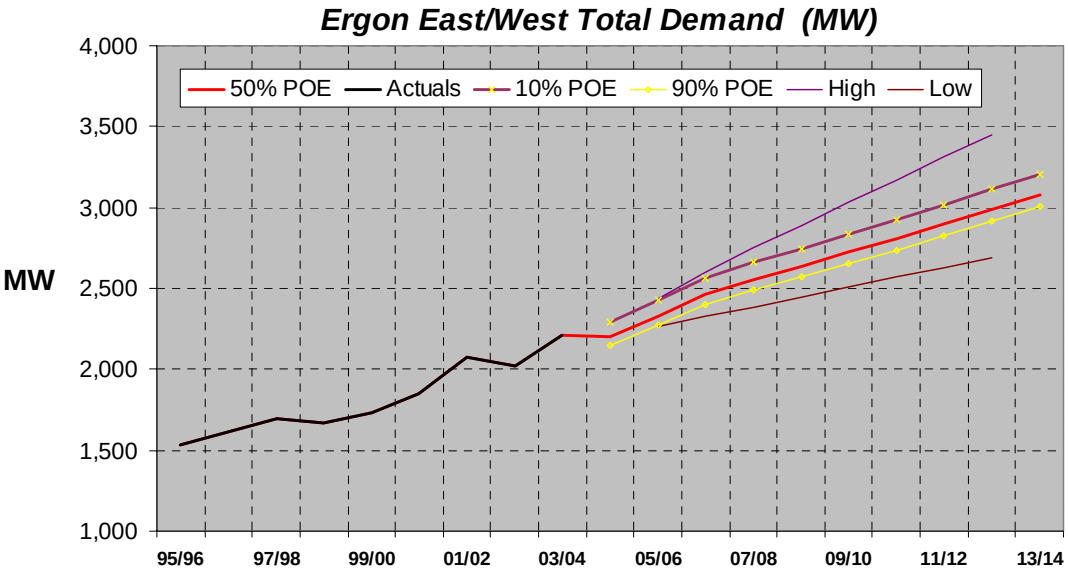
While considerable effort has gone into improving forecasting techniques since that time, the last three years also saw two annual demand peaks driven by average temperatures much higher than a 10% POE, let alone the 50% POE on which forecasts are based.

The volatility of Maximum Demand over this period is evident in the figure below.



5.2.5 Demand forecast

The latest Maximum Demand forecast for the whole of Ergon Energy's grid connected network (ie. excluding Mt Isa and isolated generation networks) is shown in the figure below.



Max. Demand recorded during 12 months ending in July of year displayed

The above graph shows the most likely (50% POE) forecast along with the 10 and 90% POE forecasts, for base economic conditions. The 'High' and 'Low' curves are the 50% POE forecasts for high and low levels of economic growth respectively.

5.2.6 Implications for Major Customer Connections

The main implication relating to network capacity for major customer connections is the erosion of spare upstream capacity to cater for growth which may result in additional augmentation works being required to enable the network to supply the major loads involved.

5.2.7 Implications for the Urban Networks

Similarly, the erosion of spare upstream capacity to cater for growth in urban networks will have the effect of increasing asset utilisation levels and accelerating network augmentation requirements.

5.2.8 Implications for the Rural Network

The many long radial sections of Ergon Energy's network pose particular capacity problems when required to accommodate changing customer usage patterns such as those associated with high rates of air conditioner penetration. As outlined in Section 3.2, these systems were designed to supply loads of a type quite different from what has evolved. However, there are virtually no effective measures available to influence customer demand growth to stay within the existing system capacity. In addition, it is frequently uneconomic to provide adequate capacity for the changing load requirements when this requires construction of extensive new infrastructure for a very limited number of customers.

The radial nature of networks in low-density areas also means an inherently lower level of supply security because of the lack of alternative supply paths or system redundancy. The supply security in such areas is further compromised when the loads approach capacity limits, with the result being higher outage rates and poorer supply quality.

5.3. Reliability of Supply

5.3.1 Factors Impacting on Reliability Performance

The reliability performance of the supply network is a function of virtually all of the factors which comprise network management, including:

- network configuration and inherent security level
- load growth rate
- design and age of network assets
- maintenance level and effectiveness (including vegetation management)
- availability and deployment of appropriate technologies
- weather patterns
- communication facilities
- operational processes and available resources.

In addition, the extent of asset exposure is a key issue of differentiation in Ergon Energy's situation. Much of Ergon Energy's network reliability performance is a function of the infrastructure technology used for low load densities and the expanse of the areas served, combined with the extreme geographical and climatic environment. Response times in isolated areas are an obvious additional concern.

Ergon Energy recognises that its long rural systems were designed as low cost systems to meet what were initially basic customer load requirements. At the time of construction in the 60s, 70s and 80s, the designs and configurations did not take into consideration the extent of the now emerging e-economy and the growth in air conditioning loads. However, analysis of network performance indicates that reliability issues are not only localised to the western part of the system.

Some coastal areas also have their share of existing or emerging reliability issues. This illustrates that the main driving issue is the typical line distance from a bulk supply or zone substation to the customer.

While augmentation, maintenance and replacement programs all contribute to reliability improvement, it is generally accepted that customers' expectations will rise over time, resulting in a widening gap that will need to be bridged by additional reliability improvement initiatives.

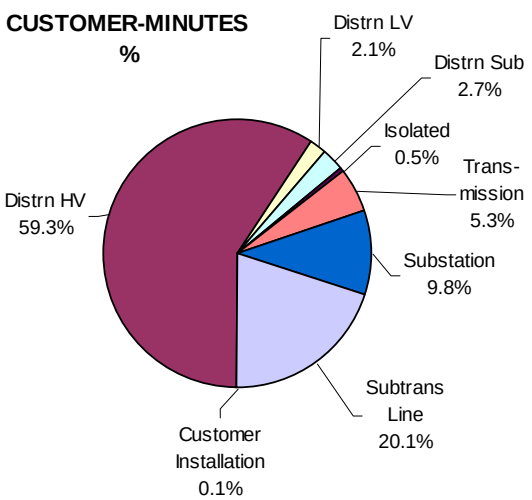
5.3.2 Reliability Performance Analysis

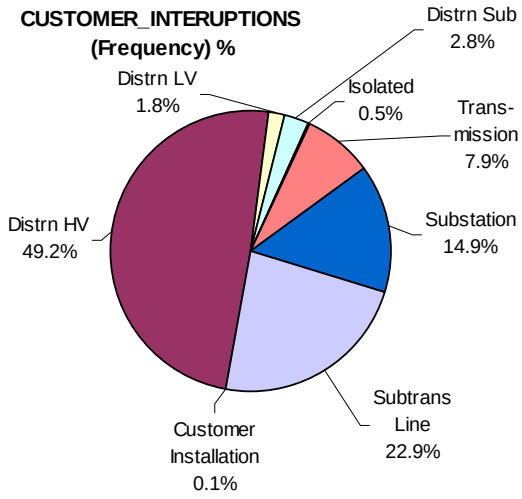
Ergon Energy uses a statistical approach to reliability performance to support the management of its large complex network. The key measures used are

- System Average Interruption Duration Index (SAIDI). This reliability performance index indicates the total minutes, on average, that customers are without electricity during the relevant period (customer-minutes).
- System Average Interruption Frequency Index (SAIFI). This reliability performance index indicates the average number of occasions each customer is interrupted during the relevant period (customer interruptions).
- Customer Average Interruption Duration Index (CAIDI). This reliability performance index indicates the interruption duration that each customer experiences on average (minutes) per interruption.

These indices are used to analyse the network's performance and provide for reporting requirements. In summary, analysis has found the following characteristics:

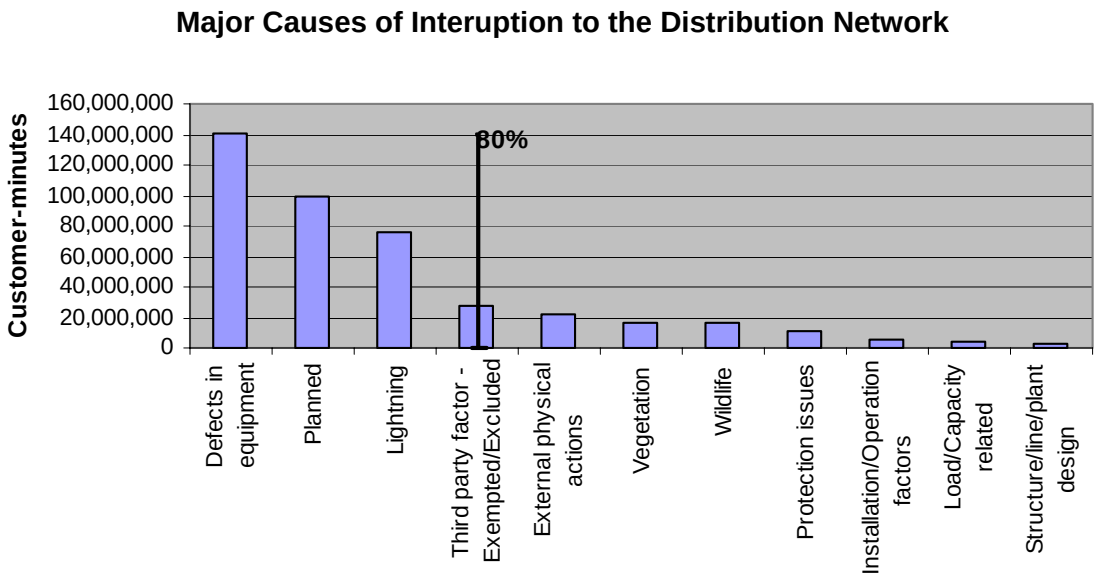
- Over the last 12 months, subtransmission outages (line and substation) represented 30% of all customer-minutes and almost 40% of all customer-interruptions that customers experienced. The majority of customer-minutes were due to incidents on the HV distribution lines.





(In the above charts, transmission relates to the contribution from Powerlink's system.)

- 80% of the causes of outages over the last 12 months (by customer-minute) are due to defective assets, planned outages, lightning and transmission faults. Despite underlying reliability improvements, the impact of the storm season will remain the major performance variable.



There has been a significant rise in the number of planned outages following the introduction of the asset inspection and defect management initiatives discussed in the following section. It is expected that this higher level of planned outages will continue for the duration of the second three year inspection cycle, and will stabilise to more normal planned outage levels once the accelerated defect management plan returns to a regular ongoing maintenance based cycle.

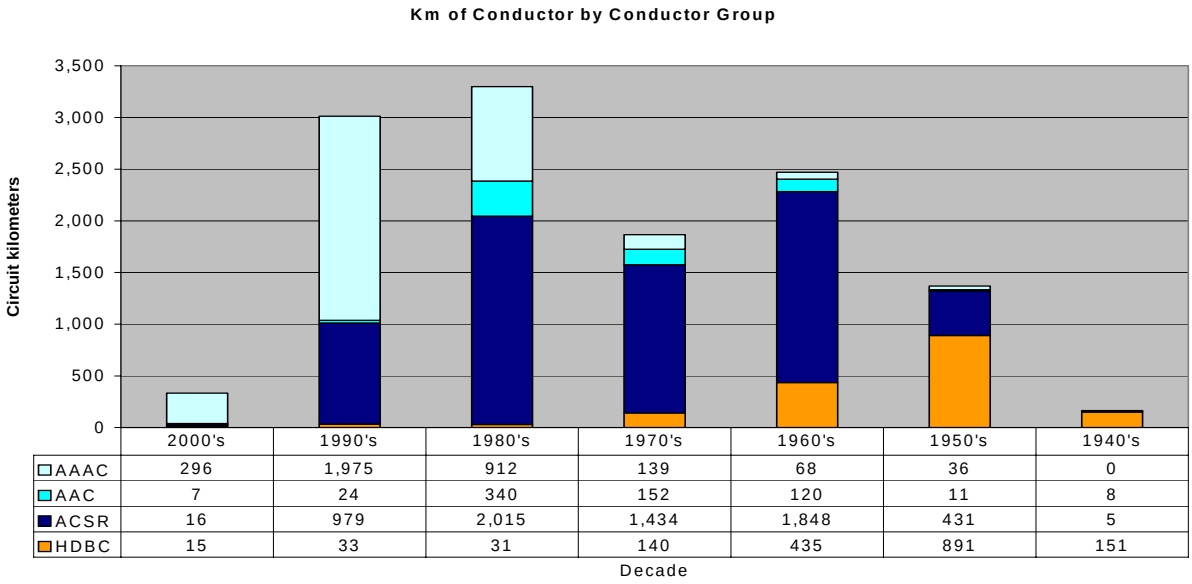
5.4. Asset Management

5.4.1 Aged Assets

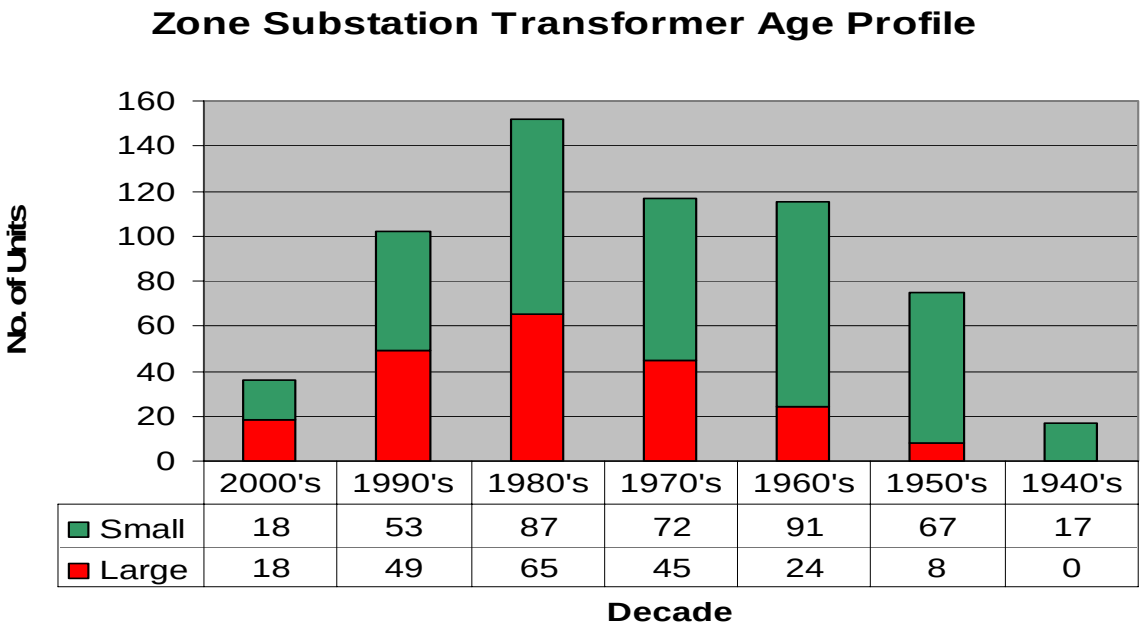
When Ergon Energy took responsibility for the network assets, it moved to implement an audit of the assets which culminated in the development of the Asset Inspection and Defect Management (AIDM) project, which involved a full inspection of all line assets over a three year cycle. The expansion of these asset inspection and defect management efforts, to target Ergon Energy's entire network and complement the AIDM project, has now been operationalised into a Network Asset Preventative Maintenance (NAPM) program.

The transition from a five-year asset inspection cycle to the three-year cycle has fast tracked the organisation's response to defect-related performance issues and revealed the need for increased maintenance and aged asset replacement expenditure. Consequently, Ergon Energy now faces significant expenditure requirements to address assets that are approaching or are already beyond their practical lives. The following graphs show the age profiles for overhead lines and zone substation transformers respectively.

In particular, the large volume of assets installed in the 1950s and 60s apparent in these graphs is the major driver of increasing refurbishment and replacement expenditure.



	2000's	1990's	1980's	1970's	1960's	1950's	1940's
AAAC	296	1,975	912	139	68	36	0
AAC	7	24	340	152	120	11	8
ACSR	16	979	2,015	1,434	1,848	431	5
HDBC	15	33	31	140	435	891	151



	2000's	1990's	1980's	1970's	1960's	1950's	1940's
Small	18	53	87	72	91	67	17
Large	18	49	65	45	24	8	0

Some of the challenges associated with Ergon Energy's asset age profile include:

- uncertainty in the nominal life for overhead conductor and risk of increasing failure rate of small copper and galvanised steel conductor.
- uncertainty in the nominal life of underground cable, particularly early XLPE cables.
- ramping up the power transformer replacement program within the next five years to forestall an expected age and condition induced increase in failures.
- effectively managing the large expenditures on the replacement of Ergon Energy's aged Supervisory Control and Data Acquisition (SCADA) master station and field equipment over the next four to five years.

5.4.2 Maintenance Management

Challenges with regard to maintenance management continue to be a function of the state of assets and management systems inherited from the legacy corporations.

The decision to embark on the AIDM project (see Section 5.4.1 above) was a response to this situation and provides the following benefits:

- better data capture of assets to enable future planning for asset maintenance
- earlier identification and rectification of asset defects on a programmed basis rather than on an emergency basis after failure of the asset.
- improved reliability and safety of the network through the earlier identification of defective poles and lines hanging below the statutory height.

A key asset inspection and defect management challenge will be the ability to complete the second three year asset inspection cycle, in conjunction with the consequent workload in asset data capture and defect remediation.

Clearing of vegetation from proximity to powerlines has been and remains an ongoing challenge in a predominantly overhead power system. Additional contracts have been awarded for a concerted vegetation management program to catch up on a backlog of clearing and trimming of vegetation encroaching into overhead lines and causing outages of supply.

Appropriate clearing cycles will then be established for different regions to allow vegetation to be controlled on a more manageable and sustainable basis.

5.4.3 Risk Management

Given that it will take some time to refurbish the required sections of the network, Ergon Energy faces the challenge of applying risk management techniques to prioritise works for optimum results in the shortest possible time and with the most efficient use of available resources and funds.

It is also appropriate to use risk management techniques in the development of security and reliability criteria, as well as action plans addressing other issues with potential to impact on the network business.

5.4.4 Disaster Management

With much of the supply area being in the Tropical Cyclone Zone and with all areas subject to the vagaries of an increasingly volatile climate, it is necessary for Ergon Energy to maintain well developed Disaster Management Plans in order to facilitate appropriate responses in the event of widespread sustained outages caused by natural disasters. This requires considerable diligence and effort.

5.4.5 Summer Preparedness

With a majority of the network experiencing summer peaks, which also coincide with the highest threat of storms and the lowest asset ratings, it has been recognised that there is a need annually to review, prioritise and undertake preparatory works, such as vegetation management and contingency planning to minimise the risks of outages to customers during this period. Ergon Energy is also committed to implementing the recommendations of the EDSD Report in this regard.

5.5. Safety and Environment

5.5.1 Safety

Ergon Energy's ultimate safety goal is to realise and sustain zero injuries in the workplace. This is regarded as paramount to the success and reputation of the business, central to Ergon Energy's social obligations and key to achieving the corporation's vision. The challenge is to move safety from a systems based, intensive focus to a fully operationalised, behaviour based culture where safety becomes an integral component of day to day operations.

5.5.2 Environment

Ergon Energy is committed to environmental responsibility in serving its customers and the community. The challenge is to target business solutions that minimise environmental impact, meet increasing community expectations of environmental stewardship, and continually enhance the corporation's environmental credentials in energy supply and solutions.

5.6. Remote Systems

Some of the challenges involved in supplying power to customers in the remotest areas of Queensland are described in Section 3 (Background) above. Ergon Energy uses a range of different technologies in addressing these challenges, including; SWER, isolated generation and stand-alone power supply solutions.

5.6.1 Single Wire Earth Return (SWER)

Throughout western Queensland Ergon Energy operates one of the lowest customer density networks in the western world which includes around 65,000 kilometres of SWER (Single Wire Earth Return) lines. This network poses unique challenges in providing cost effective and reliable electricity supply.

5.6.2 Isolated Generation

Ergon Energy's isolated power stations are located in remote areas of the Torres Strait, Cape York and the Gulf of Carpentaria, Palm Island and western Queensland. To provide supply to these isolated communities, which are not connected to the main grid, Ergon Energy owns and operates 33 isolated power stations with localised networks. The major challenge Ergon Energy is facing in this area is the ability to continue to meet the growing demand for electricity in the communities of the Torres Strait.

Apart from Thursday Island, the increased electricity demand in the Torres Strait is predominantly due to the Government's lifting of restrictions on use of air conditioners, electric cooktops, and electric water heaters. These additional appliances, particularly the additional air conditioning loads, will bring forward the need to upgrade generation capacity on a number of the islands. Ergon Energy has modelled the likely take up and developed plans to upgrade some of the more critical locations based on this modelling. However, it should be noted that the actual take up rate is quite difficult to predict. This, combined with the difficulties in upgrading power stations in these remote locations, will make it particularly challenging for Ergon Energy to meet customer expectations.

5.6.3 Stand-alone Power Supplies

To supply individual customers who can not be economically connected to the main state-wide grid or an isolated community network is a ongoing challenge, for which renewable stand-alone power supply solutions have been developed.

5.7. Business Capability

5.7.1 Human Resourcing

Ergon Energy is currently undertaking a record capital and maintenance expenditure program, which is expected to continue for some years. To deliver this program, the company has built on last year's Resource Plan and has developed a detailed 2004/05 Distribution Resource Plan. This plan has identified human resource shortages in a number of key specialist areas. The challenge is that the labour market for experienced electrical workers and para-professionals is currently very tight. This situation is particularly acute in regional and remote areas where there

is a general lack of appropriately skilled staff or contractors. It is also difficult to attract apprentices and trainees to rural and remote areas. Despite a national recruiting campaign over the last six months of 2003/04, around 17% of the vacant positions remain unfilled.

Recent experience indicates that Ergon Energy will be constrained to around 5-6% growth in the number of experienced electrical workers and must address some of the resource shortages above through apprenticeships and traineeships.

Resourcing the work required to bring the assets to 21st century standards is an issue that will take some time to address. However, Ergon Energy is making significant progress in this area. Two key organisation-wide initiatives are underway to support the business to resolve resourcing issues now and into the future, namely, the Recruitment Support Project and the Whole of Business Strategic Resourcing Project. These initiatives are outlined in more detail in section 6.7.1.

5.7.2 Data and Systems

The gathering and management of network data remains a major issue despite what has been achieved to date. The achievements have concentrated on the areas of highest risk with respect to safety and reliability, as well as essential core functions of asset identification and registration and standardised layout and data collection processes.

As part of the AIDM project, a SAP based maintenance management system for lines assets was introduced in 2002. In 2003, the need for a common layout design tool led to the implementation of the Smallworld Geographical Information System (GIS) and an enormous body of work to convert, align and cleanse the data from legacy GIS and network asset registers was undertaken. A key feature of this work has been the establishment of the GIS as the primary network asset register, with derived and supplementary data sets stored as required for various applications in a SAP based in-house asset and network connectivity database environment. This work is continuing.

FeederStat software, which is now part of a suite of applications, supported by the extended connectivity model that collects Ergon Energy's reliability statistics, manages switching requests, provides extensive reporting functions and manages planned and unplanned outages.

Ongoing challenges include:

- gathering outstanding data, and the refining of this data to achieve a satisfactory level of quality
- tying data together across the several systems, particularly the integration across GIS and asset management systems, performance reporting and works management systems
- implementing and maintaining processes that maintain the data over time.

Important challenges which have a direct impact on network operations are:

- the provision of an integrated SCADA network so that system control and network status indications can be coordinated and managed centrally rather than relying on disparate systems and multiple unconnected control centers.
- the extension and installation of SCADA to the many sites which have no such capability.

Ergon Energy is now fully investigating an integrated ERP (Enterprise Resource Planning) package for implementation during 2006 to provide integrated asset, works management, finance and HR systems. This work is being done in conjunction with Energex.

6. NETWORK STRATEGIES AND POLICIES

This Network Management Plan has been developed within the framework of Ergon Energy's comprehensive 20 year asset vision backed by policies and strategies covering all key aspects of the network business. The strategies and policies that address the key challenges facing Ergon Energy's network business are described in this section.

6.1. Customer Connections

To respond to the growth in customer-initiated works and general demand being experienced across regional Queensland, Ergon Energy has been improving its planning and general business capability. Ergon Energy's strategies to support effective network planning are outlined in Section 6.2.1. The corporation's business capability strategies are outlined in Section 6.7.

Customer connections are segmented into like groups of subdivisions, domestic, commercial and industrial (<1MVA), and major customer connections (load and generator).

For customer segments other than the major customers, Ergon Energy contributes to the cost of the project by a formula, using what is known as the '22.5% rule'. The Capital Contributions Policy is based on the expected annual retail revenue (current year dollars) divided by 22.5%. The QCA has required a change in the Capital Contributions Policy to remove the linkage to the standard Queensland Retail Tariff and use expected Network Distribution Use Of System (DUOS) revenues to determine the contribution by Ergon Energy. Although the exact details have not been finalised with the QCA, the changes are scheduled to take effect in the second quarter of 2005. The changes are not expected to result in a significant change in the amount of contribution by Ergon Energy to domestic, commercial and industrial connections.

For smaller customers, there is a method to provide for sharing of costs between initiating and subsequent customers, with a cost sharing period of five years. For all categories the costs of upstream augmentation works are allocated on a load share principle, with timing issues being dealt with by calculating the bring forward costs of a planned augmentation.

Major customer connections, loads generally above 1MVA or generators, are negotiated on an individual basis in accordance with the requirements of the National Electricity Code and the QCA.

6.2. Network Capacity and Security

6.2.1 Network Planning Policy, Targets and Strategies

6.2.1.1 Load Forecasting

Effective network planning requires reliable load forecasts, accurate asset data and the ability to simulate and analyse future scenarios using appropriate network modelling.

Ergon Energy produces 10 year Maximum Demand forecasts using regression techniques based on the available recorded data. The available data can vary from up to 15 years at bulk supply point level to only a few years in the case of some zone substations, where minimal metering had been installed by the legacy corporations. Maximum Demands are extrapolated with adjustments to accommodate confirmed and anticipated developments and other known local factors, with prospective major customer developments handled on a probabilistic basis.

Forecasts are produced for all zone and bulk supply substations and for various regional and whole of network aggregations.

The forecasts produced are intended to reflect the 'most likely' or 'base' case for 'average' weather conditions and are for practical purposes, 50% POE forecasts, ie. there is a 50%

probability that an actual peak demand will exceed the forecast value. As described in Section 5.2.2, the use of 10% POE forecasts is one way of reducing the risk that actual peak demands will exceed forecast. The EDSD Report recommended consideration of this for critical areas. While this matter is still being investigated in detail, 10% POE forecasts are in general up to 6% higher than 50% POE at typical Ergon Energy substations.

A nationally recognised forecasting company is also retained annually to produce independent forecasts at bulk supply point level using 'bottom-up' techniques, and these are used to validate the internally produced forecasts. These forecasts are produced for base, high and low economic conditions, as well as for 50% and 10% POE.

Temperature correction techniques have been developed and applied as a means for reviewing forecast accuracy. It is intended to continue application and development of temperature correction techniques for accuracy review purposes with a view to incorporating these techniques in the normal forecasting process in the future.

6.2.1.2 Planning Process

Ergon Energy's planning process involves the production of long-term strategic plans which describe the electricity supply infrastructure requirements for defined areas based on 'most likely' 20 year load growth projections. Where appropriate, scenario planning is also employed to obtain alternative development plans appropriate to a range of possible outcomes (eg. high growth).

In addition, studies are conducted to identify all existing and anticipated network limitations within a five year horizon to enable the production of five year development plans for augmentation projects. These are consistent with the longer term strategic plans.

Augmentation projects are identified and scoped in accordance with defined planning criteria – see Section 6.2.1.3 below.

6.2.1.3 Planning Criteria

Ergon Energy is implementing the recommendation of the EDSD Report that N-1 security levels be maintained at all bulk supply substations and major/critical zone substations and subtransmission feeders such that supply is maintained following the loss of a single system element. This is a higher standard of security than that previously applied, which had allowed for loads to exceed the N-1 capability for up to 1% of the time.

While Ergon Energy's other planning criteria are considered to reflect engineering and performance standards generally accepted throughout the Australian supply industry, an independent review of these criteria is being undertaken to ensure they are suited to the vision of a 'world-class, customer driven' network business. This review also includes investigation of the recommendation of the EDSD Report to examine the adoption of 10% POE forecasts for future planning in critical areas. This review is currently being completed.

Implementation of the N-1 security level recommendation referred to above has necessitated a detailed review of the network planning targets with respect to security criteria. The outcomes of this review now constitute the planning targets to be employed in Ergon Energy and are summarised below.

'Security level' denotes the inherent security of supply provided by major network components as determined by the extent of duplication or redundancy of primary serial elements and their associated secondary protection and control systems.

PRACTICAL SECURITY LEVELS

N-1:

In practice, there are three N-1 standards defined within Ergon Energy, depending on the mechanism by which continuity of supply is maintained:

A. Full N-1: Non interruptible parallel supply at Substation Busbar (this level of security implies the parallel operation of critical elements under normal circumstances; a momentary outage of duration $<$ 60 seconds while automatic switching takes place may be necessary in special circumstances).

B. Remote Switch N-1: Short outage (restoration target $\leq$ 30 minutes) may occur while load transfers are undertaken via remote control.

C. Manual Switch N-1: Medium outage (restoration target $\leq$ 3 hours) may occur while field switching is undertaken to effect load transfers.

N:

Supply to connected customers is lost in the event of failure or disconnection of a single primary element. Full restoration requires repair or reinstatement; ie. duplication or redundancy is not provided. Restoration targets are:

For loss of a substation	$\leq$ 12 hours
For loss of a subtransmission line	$\leq$ 6 hours (loads greater than 5MVA)
For loss of a subtransmission line	$<$ 12 hours (loads less than 5MVA)

Note: *Restoration times above are Ergon Energy's internal targets. They do* ***not*** *represent customer guarantees. The restoration targets have been established to ensure that appropriate contingency plans are in place and to ensure that restorations are, where possible, well within the Guaranteed Service Levels (GSLs) now applicable under the Electricity Industry Code. They are consistent with Ergon Energy's Risk Management framework and with customer expectations as determined from detailed customer research. Actual restoration times will be based on ensuring staff safety and being able to access and address the asset related issues.*

ALLOWABLE LOADING LEVELS

Substations

N-1 Substations: The maximum allowable loading for planning purposes is the Long Term Emergency Cyclic rating of the remaining transformers following loss of the largest unit (the ratings of other necessary serial elements are required to match the applicable transformer LTEC ratings).

N Substations: The maximum allowable loading for planning purposes is the Normal Cyclic rating of the transformers (the ratings of other necessary serial elements are required to match the transformers' NC rating).

Notes*:*

1. *The Long Term Emergency Cyclic (LTEC) rating of a transformer is the peak load of the daily load profile at which the transformer uses one month of its design life for each day of service without exceeding certain specified design criteria.*
2. *The Normal Cyclic (NC) rating of a transformer is the peak load of the daily load profile for which the transformer uses one day of its design life for each day of service without exceeding certain specified design criteria.*

Lines

N-1 Transmission and Subtransmission Lines: The maximum allowable loading for planning purposes is the contingency rating of the remaining line(s) following loss of the highest rated line.

N Transmission and Subtransmission Lines: The maximum allowable loading for planning purposes is the normal rating of the line.

***Notes**: For any given construction arrangement, the rating of an overhead line is a function of the effect of the prevailing ambient conditions on the temperature of the conductors.*

1. *The normal rating of a line is defined in terms of the maximum allowable current that can flow without causing conductor deterioration or statutory clearance problems. Line Ratings used for planning purposes are calculated for summer and winter, noon and evening and are based on the likely ambient conditions prevailing in the geographical area during those periods.*
2. *The contingency rating of a line is defined in a similar way to the normal rating, but allows for slightly more favourable ambient conditions, in recognition that the probability of less favourable conditions coinciding with a system contingency is small.*
3. *All power lines are also rated according to the maximum allowable voltage drop to maintain statutory voltage regulation at customers' terminals under contingency conditions for 'N-1' configurations and normal conditions for 'N' configurations.*
4. *Security Levels for lines assume that the lines have good reliability performance; ie. are in good operating condition, are well maintained and conform to current design and construction standards (eg, subtransmission lines of concrete pole OHEW design)*

Fault Ratings

The Fault Ratings of Network Assets are to be sufficient to withstand the prospective fault currents under all foreseeable circumstances.

Load Forecasts

Estimates of future loads used in assessing projected security levels employ the forecast maximum MVA demand at the 'base' economic condition and 50% Probability of Exceedance. For those parts of the network where redundancy is provided (ie. where N-1 criteria are applicable), network assets are also required to be capable of supplying the maximum MVA demand at the 'base' economic condition and 10% Probability of Exceedance, with the network intact.

TARGET SECURITY LEVELS

The following are the planning targets, which are now employed in producing the five year development plans and against which the status of Ergon Energy's network capacity and security levels are reported in this Network Management Plan. (Target security levels provide an objective framework within which network development can be planned and against which overall security levels can be assessed and reported. They do not preclude the need for detailed analysis involving reliability assessment and economic viability in the preparation of planning reports and business cases for specific projects.)

Security Levels - Planning Targets for Transmission & Subtransmission

SITE	Indicative Peak Loading (MVA)	SUBSTATIONS Base Security Level	TRANSMISSION LINES Base Security Level	SUBTRANSMISSION LINES Base Security Level
Bulk Supply Substations	> 15	N-1 (A) *	N-1	
	< 15	N-1 (C)	N	
Zone Substations	>25	N-1 (A)		N-1
	15-25	N-1 (B)		N-1
	5-15	N-1 (C)		N
	< 5	N		N

* Full N-1 may be provided via a strong subtransmission network operated meshed.

Security Levels - Planning targets for distribution network

At distribution feeder exits at zone substations:	N-1 (3 into 2)
Urban distribution feeders:	N[#]
Rural distribution feeders:	N

Notes: *'3 into 2' refers to the ability to supply the load of an out of service distribution feeder exit by transferring load to up to two of the remaining distribution feeder exits. Field switching facilities to enable '3 into 2' security are provided within the distribution network in close proximity to the zone substation.*

[#] *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.*

6.2.2 Implementation Strategies

An audit of the state of the supply network with respect to the new planning criteria has been undertaken along with a review of the proposed augmentation expenditure program. The results of this audit are summarised in Section 7.2.2. While the effect of the criteria change is to bring forward the programming of a number of augmentation projects, the result is wholly consistent with the commitment Ergon Energy had already made in programming a significant increase in augmentation expenditure to improve existing and projected security levels.

The net effect of the change has been to increase the programmed augmentation expenditure by the order of 10%.

Implementation of the expenditure program will be done by prioritising individual projects in accordance with the Risk Management Framework outlined in Section 6.4.1. Works will then be scheduled in accordance with resource availability in order to complete the program in full by the end of 2009/10.

With regard to HV distribution feeders, initiatives to reduce constraints are focused on:

- upgrading existing urban feeder capacity and developing new feeders to coincide with the development of new zone substations
- augmentation works to improve capacity and voltage of rural distribution networks
- Installation of additional transfer points within the distribution network

- re-rating existing plant through works such as line re-surveys and retensioning and replacement backfilling of cable trenches
- review of protection settings/ protection upgrades to minimise load encroachment upon settings of distribution feeder exit points
- distribution single phase load re-balancing
- deployment of temporary embedded peak lopping generators to limit loads on feeders in extreme cases.

6.2.3 Demand Management

Emphasis on demand management has historically concentrated on utilisation of pricing signals through off-peak tariffs, controlled tariffs and direct load management through ripple control systems. In general, demand management/load control has already deferred significant capital expenditure. Future benefits are likely to be available only on an incremental basis through improved load analysis and more targeted load switching. The effective demand controllable by the ripple-control system is estimated to be up to approximately 100MW for each of Tariffs 31 and 33.

Opportunities for further demand management using load switching are largely dependent upon the development and deployment of appropriate tariffs. Ergon Energy is involved with the relevant authorities in ongoing examination of ways to provide additional demand management solutions without compromising the utility enjoyed by customers.

Ergon Energy is committed to maintaining the capacity to manage controlled tariffs and is undertaking a major load control injection plant refurbishment program.

Currently, the network business is in the process of identifying opportunities where distributed generation can be deployed within the distribution network to reduce demand on the upstream network and deliver network services at optimal cost. Ergon Energy has four sites on its regulated network where it currently uses generation to manage network demand by supporting the service capabilities of the existing traditional distribution asset.

Limited curtailable load has been developed to enable Ergon Energy's retail subsidiary to respond to energy price signals (NEM), which, in some instances, can support network performance. This has been achieved through agreements with a number of large customers to allow load shedding in times of extreme system conditions.

Ergon Energy is also currently researching the future role of distributed generation and demand management. Scenarios exist which anticipate a distribution network in which distributed utility capability is increasingly deployed in the network by customers and network operators supported by real time network management and customer/network/retailer communication capability. Within this real-time environment, it is expected that demand management response to energy price signals and to network constraints will become more sophisticated and more valuable to both the supply industry and the customer.

Some recent initiatives by Ergon Energy's retail subsidiary have addressed demand management through customer awareness campaigns (promoting optimisation of air conditioning load, etc) and educational material. In general, this activity has not been related directly to specific network outcomes but to wider system energy efficiency and customer cost reduction.

Opportunities for demand management solutions will also be promulgated in the market place by virtue of the publication of Part B of this Network Management Plan, which will provide information to interested parties regarding projected network limitations.

6.3. Reliability of Supply

Ergon Energy is committed to providing a distribution network that delivers quality and reliability of supply consistent with reasonable customer expectations of service and cost.

The overall reliability strategy is to understand reasonable customer expectations, identify the gaps between those expectations and current performance, and develop solutions to bridge the gaps, acknowledging that customers' expectations are continuing to rise over time.

Reliability Performance is also subject to recently mandated Minimum Service Standards and Guaranteed Service Levels.

6.3.1 Customer Expectations

In 2003, Ergon Energy commissioned detailed customer research to assist in developing a comprehensive reliability improvement strategy. The research covered considerations vital to forecasting and infrastructure planning, such as identification of reliability thresholds for different customer segments, as well as consumption patterns and drivers. This research has enabled customer expectations to be represented as reliability thresholds:

- Feeder Thresholds - General customer expectations have been identified through customer surveys for the Feeder Threshold of acceptable reliability performance, above which the majority of customers value an improvement in reliability.
- Community Thresholds - A set of Community Thresholds which represent acceptable community reliability levels, with varying threshold levels for varying sizes of communities, have also been established.

The Feeder Thresholds are based on statistically valid customer survey data. However, the Community Thresholds are nominal thresholds only at this stage, until more statistically valid customer survey analysis is obtained. This work is continuing across 2005.

6.3.2 Minimum Service Standards and Guaranteed Service Levels

Minimum Service Standards (MSS) have now been established as part of the Electricity Industry Code. These minimum service standards define the overall reliability performance levels required of Ergon Energy's network and include provision for managed improvement of performance over time. The following is an extract from the Code of the sections relevant to Ergon Energy.

System Average Interruption Duration Index (SAIDI)

Feeder Type	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10
urban	220	215	205	195	180	150
short rural	610	590	570	550	500	430
long rural	1,180	1,150	1,130	1,090	1,040	980

System Average Interruption Frequency Index (SAIFI)

Feeder Type	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10
urban	2.75	2.70	2.60	2.50	2.30	2.00
short rural	5.70	5.40	5.20	5.00	4.50	4.00
long rural	9.00	8.75	8.60	8.50	7.80	7.50

Guaranteed Service Levels (GSLs) applicable to the reliability performance experienced by individual customers are also been implemented under the Electricity Industry Code with effect from 1 July 2005. The GSLs relate to both the duration of individual outages and the number of interruptions (SAIFI with exclusions) in a financial year.

These GSLs provide for the payment of rebates to individual customers who suffer excessive outages. This framework helps ensure that the statistical approach necessary to the management of reliability performance in a large complex network does not lead to particular 'outlying' cases not receiving appropriate attention. The following is an extract from the Code relevant to Ergon Energy's reliability GSLs:

(a) This clause 5.9 takes effect on 1 July 2005.

(b) Subject to paragraphs (c) and (d), a *non-contestable customer* is eligible for a *GSL rebate* of $80 from its *distribution entity* in either of the following circumstances:

(i) each *interruption* to its *premises* which, if connected to:

(A) …

(B) an *urban* or *short rural feeder* - lasts longer than 18 hours; or

(C) a *long rural* or *isolated feeder* - lasts longer than 24 hours,

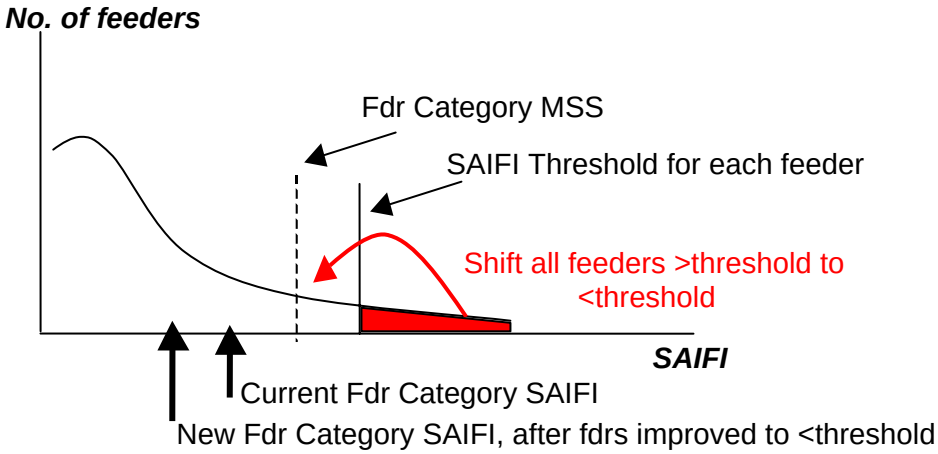
("*interruption duration GSL*"); or

(ii) once that *customer* experiences the relevant number of *interruptions* at its *premises* in a *financial year* as set out in the following table ("*interruption frequency GSL*").

Distribution entity	***Feeder type* through which the *customer's premises* is supplied**	**Number of *interruptions* in a *financial year* ***
Ergon Energy	*Urban*	13
	Short Rural	21
	Long Rural	21
	Isolated	21
	* A customer is not entitled to more than one *GSL rebate* under clause 5.9(b)(ii) in a *financial year*.	

6.3.3 Strategies for Improvement

Ergon Energy's improvement strategies are summarized in the following diagram.



Distribution of feeder performances in a Feeder Category

The feeder category Minimum Service Standard (MSS) represent a standard for the average performance of all the feeders in that feeder category.

The feeder thresholds have been established by the customer survey work and are customer-nominated limits to acceptable individual feeder performance.

Although the thresholds for individual feeders are higher than the MSS, improving performance of individual feeders to below the threshold has the effect of improving the overall SAIDI and SAIFI by essentially removing the tail from the feeder performance distribution above.

Ergon Energy is also deploying improvement strategies to address poorly performing community supply. The aim is to bring poorly performing communities below nominated thresholds of frequency of whole-of-community outages. This will reduce the number of community-wide outages, and will also further improve the overall SAIDI and SAIFI by improving the performance of those feeders that supply communities.

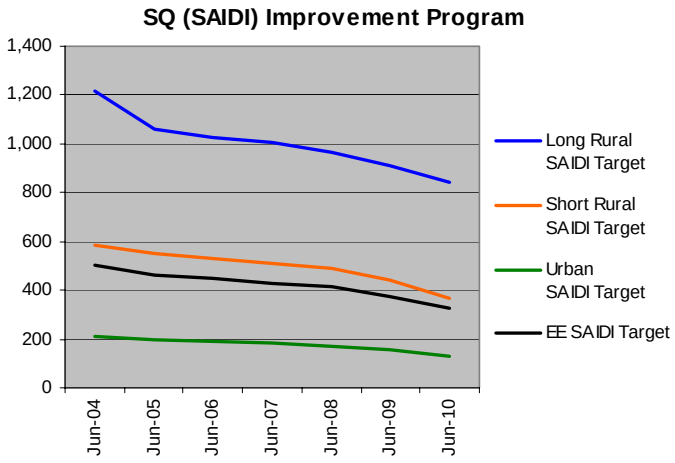
6.3.4 Reliability Improvement Initiatives

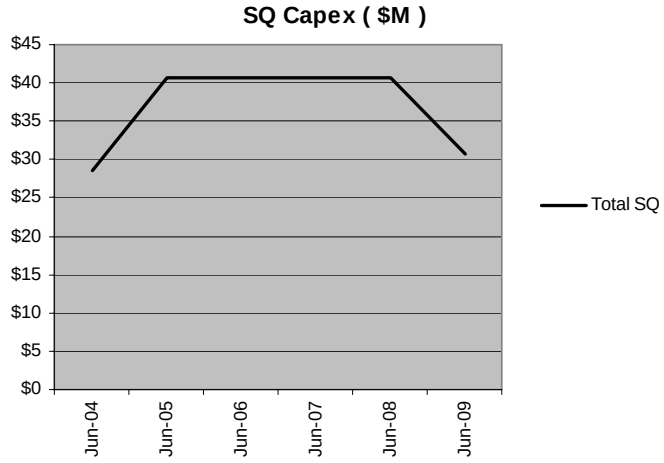
Ergon Energy's asset augmentation, accelerated maintenance and asset life-cycle replacement programs contribute to improving reliability performance by increasing the inherent security of the network along with asset capacity, preventing load-related outages and reducing the number of asset in-service failures. These benefits, however, will not deliver the targeted thresholds or minimum service levels required.

A five year program of specific reliability improvement works has been developed to bridge the gaps between the existing performance and the Minimum Service Standards. Ergon Energy has assessed that by focusing on the feeder and community performance that is not meeting the respective thresholds, the overall Minimum Service Standards will be addressed.

The worst performing areas of the network are established by comparison to customer surveyed requirements (ie. Feeder and Community Thresholds). The priorities for specific reliability improvement are based on improving these worst performing areas to appropriate levels.

The reliability improvement program is targeting an overall SAIDI improvement of over 25% over the period to June 2010. This is consistent with the Minimum Service Standards outlined above.





6.4. Asset Management

6.4.1 Risk Management

Under the Risk Management Policy approved by the Board in 2001, Ergon Energy has adopted a risk management framework with the following primary objectives:

- ensure that the overall strategic direction of the business is appropriate in view of the external market and the political / regulatory environment in which it operates;
- identify business priorities and allocate resources effectively and efficiently;
- demonstrate due diligence in discharging legal and regulatory requirements and meeting the expectations and standards of external stakeholders; and
- identify and maximize opportunities for business growth and diversification.

Risk management drives virtually all network activities and programs, including maintenance and replacement, reliability assessment and improvement and network augmentation. Risks are rated according to the Australian Risk Management Standard (AS / NZS 4360), and are assessed with reference to the Ergon Energy risk management framework and potential adverse impacts with respect to:

- public and employee safety
- customer lost load and supply disruption
- financial performance
- exposure to litigation / prosecution
- the natural environment
- Ergon Energy's public reputation.

Risk management considerations have resulted in type-based replacement programs for assets found to possess failure modes posing a safety or fire risk. All asset inspection programs have an implied purpose of assessing risk linked to asset condition.

Assessed risk is further used as the principal driver of priorities for each equipment-based plan, so ensuring that individual assets which represent the highest risk are managed to mitigate that risk to acceptable levels.

The results of risk assessment studies also help determine the relative allocations of physical and financial resources among the various asset management programs and support activities.

A formal project risk assessment methodology is applied when assessing network projects for inclusion in expenditure programs. This methodology, which employs a risk management matrix, facilitates the ranking of projects for capital prioritisation purposes and is aimed at optimising Ergon Energy's capital spend in accordance with the established criteria outlined above.

6.4.2 Maintenance and Replacement

Ergon Energy has developed a plan for the balanced, efficient and effective maintenance and replacement of Network assets. Goals set for the maintenance and replacement plan arise from:

- the present and future needs of the asset
- legislative requirements
- ensuring employee, public and environmental safety
- customer expectations of reliability
- internal and external benchmarks.

The maintenance and replacement plan concentrates on strategic maintenance policy identifying what maintenance and replacement should be undertaken. Detailed strategies are contained within maintenance and replacement plan documents specific to each asset type.

Each of the 26 equipment-based plans is the subject of ongoing refinement to ensure continuous improvement of outcomes and to strive to meet or exceed industry best practice.

Prudent management of the network requires considered assessment of the present and future needs of the asset. Expenditure projections are based on a combination of both known issues (eg. outdated SCADA equipment requiring replacement) and anticipated increases in expenditure as the network ages.

Expectation of asset failures is derived from either statistical analysis of asset condition data or documented industry experience. Ergon Energy uses age-replacement models based mostly on industry figures for replacement ages, as there is limited documented history of asset failures available within Ergon Energy to substantiate failure distribution style models.

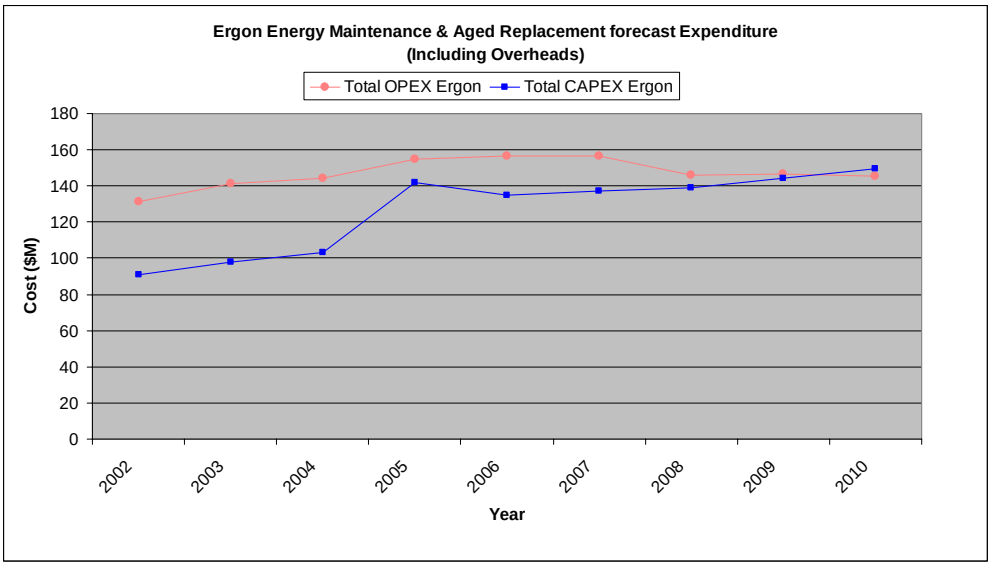
Legislated requirements for network assets, for example pole inspection cycles, earth testing, and maintenance of protection systems, are built into the maintenance plans. Public and environmental safety goals are zero-based targets. Progress to this goal is assisted by the risk management methods outlined above.

Ergon Energy employs several integrated business systems to manage the maintenance and replacement activities on the network. These range from SAP based maintenance management systems to business cycle preparation of plans and budgets. Maintenance management philosophy is embodied in a three level approach of inspecting and maintaining on standard cycles, fixing outstanding defects, and targeting poorly performing assets and high incidence fault types. All these processes have systems in place to monitor and report performance and/or non-compliance.

In accordance with a recommendation of the EDSD Report, a program has been implemented to include all appropriate asset categories into the SAP and GIS systems within the next two years so that all inspection, maintenance and reporting is scheduled and managed in a consistent and coordinated manner.

Projected asset replacement expenditure has been validated by benchmarking with an independent external organisation, which produced reasonable alignment with Ergon Energy's proposal. The replacement models indicate that the strategies being adopted will result in the average remaining life of network assets stabilising at approximately 50%.

The following graph presents projected maintenance and replacement expenditure.



6.4.3 Disaster Management

Ergon Energy's operational priorities in order of importance are:

- ensuring personal safety of both the public and Ergon Energy staff
- keeping the community informed
- protecting equipment and infrastructure from damage
- efficient supply restoration – including meeting the communication requirements of customers and other emergency services.

To ensure effective response where there is a widespread loss of power, Ergon Energy's Disaster Management Plan includes six regional Emergency Management Plans to coordinate resources for response at the regional level. The objective of these plans is to enable and facilitate the control and direction of activities and the coordination of all resources necessary to effectively respond in accordance with the above priorities.

The plans are updated, tested and audited annually with a view to their being completed before the end of October each year.

The Disaster Management Plan is supported by subsidiary plans from other business units indicating how they will support the restoration process.

Each regional plan also has supporting plans based on both business units and geographic responses, which are stored on local shared drives. These plans have now been tested twice (2002, 2003) and have been activated twice in 2003/04.

6.4.4 Summer Preparedness

Summer preparedness is a key annual focus for Ergon Energy given the far-flung nature of its regional Queensland network, the vast distances, the widely distributed population, and the inherent exposure to high impact weather events – severe storms, lightning, cyclones and bushfires.

Last year Ergon Energy developed a comprehensive program in preparation for the summer storm season, which has now been enhanced by customer feedback, the learnings from last summer and by the issues identified in the independent review panel's EDSD report.

Aligned with Ergon Energy's record investment in capital works and maintenance, this year's improved summer preparedness program is indicative of the corporation's proactive approach in listening to customers, dealing with inherited network issues and addressing increasing community expectations.

While major weather events across Ergon Energy's service area are not controllable, action is being taken to prevent or minimise summer storm season impacts on Queensland's regional communities, through:

- improved preparation of the network to minimise the potential for outages (loss of supply);
- responding more quickly and effectively to outages; and
- keeping communities informed in recognition of customers' need for effective information.

<u>Lessening the potential for outages</u>

By the end of this summer, compared with last year, Ergon Energy will have:

- added additional capacity to cater for growth in summer peak demand (242 MVA or 10% of summer peak);
- boosted network reliability by virtually eliminating identified defects and completing substantial capital upgrades;

- spent another $6 million on undergrounding conductors and protecting feeders to key community facilities under the Cyclone Area Reliability Enhancement (CARE) program; and
- made significant advances in preventive pre-storm season vegetation management with another $40 million-plus investment.

Quicker response when outages occur

Ergon Energy recognises that outages can still occur and that these represent significant customer inconvenience. Ergon Energy is doing everything in its power to ensure that it is prepared and focused on returning supply to customers as quickly and as safely as possible. For example:

- additional resources are available with 200 field positions filled over the past 12 months;
- emergency response plans are in place for each region and are being tested in preparation for the storm/cyclone season; and
- essential spare parts are more readily available and contingency plans deployed for ready access to key equipment.

Keeping customers informed

Ergon Energy will continue to develop its proactive approach to customer and key regional stakeholder communications by implementing the review panel's EDSD recommendations on communications and responding to the lessons from the summer preparedness program run last summer.

This summer, compared with last summer, the focus will be on:

- better communication with customers through Ergon Energy's contact centre, with enhancements to the Interactive Voice Response messaging system and the opening of a new satellite facility in Townsville in December 2004;
- reliable communication with customers through the recruitment of 'storm temps' into the contact centre and the progression of overflow arrangements jointly with Energex to secure additional capacity during the summer period;
- a new dedicated emergency line available to customers from October 2004; and
- more outage communications through local radio and other media.

6.5. Safety and Environment

6.5.1 Safety

Ergon Energy's Workplace Health and Safety Policy is based on a commitment to providing a work environment, and conducting the organisation's activities in a way that ensures the health and safety of employees, contractors and members of the general public.

Key strategies to support this policy include the:

- implementation of a Health and Safety Management System that not only meets all statutory and industry health and safety requirements but also aims to achieve best practice through continuous improvement. This strategy provides a systematic approach to organising health and safety standards, processes, accountabilities, documents, and outcomes to allow easy integration with Ergon Energy's mainstream business requirements.

- integration of public safety and workplace health and safety requirements into all relevant business processes and decisions. This includes the proactive development and implementation of procedures and standard work practices to manage exposure to workplace hazards.
- involvement of employees in the development and implementation of Workplace Health and Safety programs, together with a strong demonstration of management's commitment to, and accountability for both public safety and workplace health and safety.
- efforts being undertaken to ensure all employees and contractors have the information and training required to competently and safely perform their work, and that they accept that working safely is a condition of employment.

Ergon Energy will maintain a continued focus on safety for the benefit of the public, contractors and employees, both inside and outside of the workplace. The aim is to achieve a target of zero incidents in a five-year timeframe.

6.5.2 Environment

The corporation's Environmental Policy makes a commitment to managing the environmental impacts of Ergon Energy's products, services and processes to comply with laws, regulations and other requirements, as well as recognised environmental benchmarks, and with a continuous improvement approach.

It supports the principles of sustainable development by promoting safe and responsible work practices, encouraging environmental awareness and responsibility through the internal and external reporting of the corporation's performance, and promoting a pollution-prevention ethic within Ergon Energy.

Ergon Energy's strategic response to the operational environmental challenges it faces is supported by an externally certified Environmental Management System.

Specifically, in order to protect biodiversity and ecological systems in the development, operation and maintenance of the electrical network, Ergon Energy's environmental management practices have been developed to deal with:

- oil and fuel management - storage and spill management
- pole management - chemical preservation, in-situ treatment and disposal
- soil management - erosion, acid sulfate soils, contaminated land, salinity, and waterfront management
- vegetation management - vegetation removal, landscaping and revegetation, noxious plants and bushfire risk control
- fauna management - protected fauna and significant habitat, protection of livestock and pest animals
- waste management - hazardous waste and recycling
- emission management - ozone depleting substances, greenhouse gas emissions and National Pollutant Inventory substances
- social issues management - noise, visual amenity, cultural heritage and Electromagnetic Fields (EMFs).

Ergon Energy has recognised that greenhouse gas abatement is a key strategic environmental objective and is a voluntary participant in the Greenhouse Challenge Program, a Commonwealth Government initiative to reduce and monitor greenhouse gas emissions that could contribute to global warming. The major area of influence for Ergon Energy is with respect to network losses, which are in effect wasted energy, representing additional CO_2 emissions from thermal power stations. Ergon Energy's Greenhouse Challenge agreement covers this and

other areas with a comprehensive list of 75 abatement actions in progress, which are reported against annually to the Australian Greenhouse Office.

6.6. Remote Systems

6.6.1 Single Wire Earth Return (SWER)

Further to a recommendation of the EDSD Report, a joint Ergon Energy and Government taskforce has been established to consider options for improving the reliability of supply in areas currently serviced by SWER lines.

The taskforce's terms of reference are to assess:

a. The nature and extent of the existing reliability and quality of supply problems being faced by customers serviced from the SWER network.
b. The technical characteristics, viability and potential effectiveness of currently available options for improving the reliability and quality of supply received by these customers, including but not limited to:
    - supply side solutions to address capacity and reliability
    - demand–side solutions to address load growth and quality of supply
    - an improved and sustainable customer service and response capability.
c. The implementation costs of the identified options.
d. Alternative options for funding the identified options, including involving the Queensland Government, the Commonwealth Government, Ergon Energy, the private sector and customers.
e. The value for money provided by the various options.

The taskforce is required to report to the Minister for Energy by February 2005 on the above matters and recommend a preferred option, or range of options, for improving the reliability and quality of supply to customers, including proposed funding arrangements.

It is expected that future strategies for the management of the SWER systems will be developed and implemented in accordance with the outcomes of the joint taskforce investigation.

6.6.2 Isolated Generation

Along with the delivery of a major capital works program in the Torres Strait, the short-term response to increasing demand is focused on ensuring there are sufficient generators on stand-by during the summer period should load growth be above predictions on some of the islands. In the longer term, apart from continued monitoring of demand growth trends and appropriate augmentation, application of other relevant strategic initiatives including the further use of renewable technologies and encouragement of energy efficiency are envisaged.

The strategy is to provide long term, cost effective, legislative compliant, reliable utility grade electricity supply to remote communities supplied by Ergon Energy's isolated generation.

To achieve this, detailed maintenance and development plans have been compiled for the 33 sites with the aim of delivering the optimum life cycle costing while providing utility grade supply to the customers in these communities. These plans have been developed by modelling the power station performance, using Ergon Energy's power station simulator, to achieve the optimum balance of cost (capital and operating) and reliability.

To ensure high performance of these assets, the systems are monitored using the latest power station SCADA system developed by Ergon Energy. Ergon Energy's power station SCADA provides accurate performance data that can be used to determine system performance and opportunity for improvement.

The power station assets are managed using a computer-based asset management tool (MEX). This system provides the ability to track assets, link maintenance policies to particular plant, create work orders and log the history of planned and unplanned maintenance. Maintenance policies are currently under development.

Design and operational standards are currently being developed to ensure legislative compliance and consistency of approach in all communities.

Alternative technology strategy is currently being developed to ensure that the optimum technology and fuel source is used in these locations. Alternatives can include the use of renewable energy technologies and energy sources, such as wind, solar, geothermal, diesohol etc.

This strategy combined with period supply contracts for major plant (generators and fuel tanks) and consumables (fuel and lubricants) and the ability of Ergon Energy to hedge fuel pricing enables Ergon Energy to provide a cost effective solution to providing reliable electricity to isolated customers.

6.6.3 Stand-alone Power Supplies

In response to this need, Ergon Energy has developed modular stationpower® and homepower Stand-alone Power Supply (SPS) systems. The systems are tailored to each customer's needs to provide a reliable power supply, 24 hours, seven-days-a-week and incorporate solar and/or wind power to reduce fuel usage and minimise emissions into the environment. Stationpower® systems range from 5kW to 30kW inverter output capacity (delivering between 50kWh and 250kWh per day).

Although the units are provided by Ergon Energy on a commercial basis, off-grid property owners may be eligible for Government rebates of 50% or 65% of installation costs (Rebate schemes are administered through the Sustainable Industries Division of the Environmental Protection Agency).

Ergon Energy is also involved in the Bushlight program – aimed at improving the quality of life in small remote indigenous communities across northern Australia through the provision of sustainable energy services. Bushlight systems are commonly 2-3kW inverter output capacity (delivering around 3kWh - 5kWh per day).

An emerging opportunity in this area is the development of Ergon Energy's stand-alone supply expertise to provide back-up grid support to customers linked to remote sections of the state grid or as an alternative to grid extensions or upgrades. Realising this opportunity has the potential to reduce asset lifetime costs and achieve reliability improvements for customers located at the end of long radial SWER lines.

6.7. Business Capability

6.7.1 Human Resourcing

A Distribution Resource Plan for 2004/05 has been developed to support the record capital and maintenance expenditure program underway. This plan also lays the foundation for the requirements for future years. It builds on the 2003/04 Resource Plan, which delivered improvements to contractor arrangements, converted long-term labour hire and term appointment positions to full time permanent, and lifted apprenticeship intakes to a level consistent with workforce attrition forecasts.

During 2004/05, it is planned to recruit an additional 100 technical staff, 80 apprentices and 20 trainees to help meet customer service and reliability goals – this is on top of 200 extra field workers recruited in the last financial year.

The strategy being adopted aims at ensuring that employees are not stranded in the medium to long-term as a result of recruitment for high short-term resourcing requirements. A conservative

economic scenario combined with strong internal labour productivity projections underpins the strategy. Other aspects of the strategy address internal staff development, retention strategies in specialist and regional areas and further development of relationships with external service providers.

External service providers will continue to be engaged through a competitive tender process that requires all contractors to demonstrate their ability to meet and comply with all legislative and regulatory requirements, with a focus on ensuring operating procedures are aligned, as a minimum, with those applicable to Ergon Energy and its employees. This process will also include the use of pre-qualification panels and compliance audits.

In support of these initiatives, Ergon Energy as a business is addressing near-term and long-term resourcing needs via two projects.

To assist with near-term resourcing, a Recruitment Support Project has been tasked with implementing innovative ways of recruiting people (particularly those with scarce technical skills) in a fiercely competitive national and international market. A major international recruitment firm has been selected to assist with the development of an action plan ready for early 2005. Once implemented, Ergon Energy expects that the action plan will greatly enhance the corporation's recruitment success rates.

To assist with strategic resourcing, beyond the timeline and focus of the current Distribution Resource Plan, a Strategic Resource Planning project is underway. This project is a multi-phased project designed to:

- develop a whole-of-business strategic resource planning model that will be used to guide Ergon Energy's resource planning for the next 10 years
- develop suggested resourcing strategies and solutions for the next 10 years
- develop a single resource plan for the entire organisation
- support the development of business unit resource plans (in line with the new model and single resource plan)
- implement the strategies to address identified resource issues.

Phase One of the project (due for finalisation in January 2005) involves the application of a five step resource planning model across Ergon Energy. The steps are as follows:

- the development of two potential strategic business scenarios as a basis for considering future resource requirements.
- estimating demand for resources in critical job roles (numbers and skills) under each scenario over a 10 year period.
- calculating supply of staff based on current workforce information and external labour market trends. Some of the factors being considered include age profiles, critical skill sets, tenure, workforce mix, gender balance, attrition and recruitment rates.
- developing strategies to bridge the gap between resource demands and supply.
- the deployment of HR/ER strategies to provide resource flexibility and mobility.

In addition to these two projects, the corporation is supported by an employment and industrial relations strategy that aims to ensure Ergon Energy is an employer of choice and to attract and retain the highest quality people. The strategy involves several initiatives including:

- strategic employee relations management
- inclusive EBA planning and involvement
- progressive remuneration strategies
- leadership and supervisory development programs
- reward and recognition programs
- pro-active grievance management processes
- employee counselling and support processes

- flexible work practices
- employee work-life balance programs.

6.7.2 Data and Systems

The vision for Ergon Energy's network data and systems is being implemented through the progressive implementation of various systems. In the future the work will continue as the systems and data requirements of initiatives, such as Ergon Energy's NAPM, are met.

The current strategies for network data and systems are summarised below.

Network data strategies:

- build a flexible framework to accommodate the network model
- populate key parts of the model, build systems integrated into the model
- source the model from core systems
- improve and audit supporting processes for data maintenance
- complete the data capture and cleanse/align data to a standard where Distribution Management System (DMS) applications can be supported in three to five years.

Network systems strategies:

- the core systems for data management to be based on integration of the proprietary GIS and Asset Management Systems with the corporate network database.
- asset management and maintenance
- Layout/design tools to be based on the proprietary GIS.
- outage management to use the in-house developed – 'FeederStat' until replaced by integrated DMS component
- generation of schematics - migrate from CAD to GIS

Corporate systems strategies:

- the implementation of an integrated ERP solution is currently being investigated in conjunction with Energex.

Future strategies are expected to be largely influenced by the decision to implement joint IT&T arrangements with Energex. This joint arrangement came into being on 1 July 2004 in the form of a jointly owned company, Sparq Solutions, charged with providing ongoing operations and maintenance as well as IT&T capital projects for both corporations.

7. STATUS REPORT

This section outlines the current status in relation to the key challenges and strategies outlined in Sections 5 and 6.

7.1. Customer Connections

The following table shows expenditure on customer-requested works for the 2003/04 year and against budget for the 2004/05 year. Section 5.1 also includes information relevant to the current status of customer connections.

CUSTOMER-INITIATED WORKS	2003/04 Actual $,000	2004/05 Budget $,000	YTD (End Nov) $,000
Commercial & Industrial	59,709	40,485	15,811
Domestic & Rural	24,085	20,225	10,207
Sub Divisions	37,353	37,394	21,266
Public Lighting	2,720	3,090	1,369
Meter & Services	12,295	13,038	5,214
Major Customer Projects		31,007	8,718
TOTAL	**136,162**	**145,238**	**62,585**

The demand for customer connection is increasing in all segments across all areas of Ergon Energy. In the first three months of the 2004/05 financial year there have been over 1,400 applications for network connections (extensions of supply).

The number of lots developed in subdivisions was approximately 7,500 in 2002/03 and 6,500 in 2003/04.

The following table shows projected customer-initiated capital expenditure.

CUSTOMER-INITIATED WORKS	Forecast 2005/06 $,000	2006/07 $,000	2007/08 $,000	2008/09 $,000	2009/10 $,000
- Commercial & Industrial	38,496	39,841	40,594	42,328	43,856
- Domestic & Rural	19,794	20,357	20,610	21,355	21,986
- Sub Divisions	35,352	36,446	36,990	38,422	39,654
- Major Customer Projects	43,792	44,401	44,102	45,168	45,875
- Meter & Services	13,736	14,012	14,292	14,578	14,869
- Public Lighting	4,456	4,594	4,663	4,843	4,998
TOTAL	155,625	159,650	161,250	166,694	171,238

7.2. Network Capacity and Security

7.2.1 Augmentation Expenditure

The following table shows expenditure against budget on network augmentation works for the 2003/04 year and against budget for 2004/05.

AUGMENTATION	2003/04 Actual $,000	2004/05 Budget $,000	YTD (End Oct) $,000
Distribution Augmentation	22,252	22,977	9,216
Subtransmission Augmentation	26,628	45,964	8,404
Transmission Augmentation	653	2,127	516
Major Projects Subtransmission Augmentation		18,128	7,807
TOTAL	**49,533**	**89,196**	**25,943**

7.2.2 Asset Status

SUBSTATION SECURITY LEVELS

Bulk Supply Substation Summary

Excluding substations dedicated to single customers, Ergon Energy owns 19 bulk supply substations. The current and projected situations for these 19 substations are summarised in the following tables.

Current Status (2003/04)

Ergon Energy Owned Bulk Supply Substations		CURRENT ACTUAL SECURITY LEVEL					Number Outside Target	Total Number
		N-1(A)	N-1(B)	N-1(C)	N	Max Load> NC Rating		
LOAD / TARGET SECURITY LEVEL	<15MVA / N-1(C)	2	0	2	0	0	0	4
	>15MVA / N-1(A)	4	1	4	6	0	11	15
							11	19

Thirteen of the 19 (68%) bulk supply substations currently have an N-1 level of security. Six bulk supply substations do not currently have an N-1 level of security, while a further five that do have N-1, are in a minor state of non-compliance (ie are 'B' or 'C' rather than 'A').

Projected Status (2009/10)

Ergon Energy Owned Bulk Supply Substations		PROJECTED ACTUAL SECURITY LEVEL					Number Outside Target	Total Number
		N-1(A)	N-1(B)	N-1(C)	N	Max Load> NC Rating		
LOAD / TARGET SECURITY LEVEL	<15MVA / N-1(C)	2	0	3	0	0	0	5
	>15MVA / N-1(A)	18	1	0	0	0	1	19
							1	24

Ergon Energy has current project plans to construct five new bulk supply substations over the next five years. In addition, project plans are in place to bring all bulk supply substations to within N-1 security levels by 2010. Based on current project plans only one substation is expected to be in a relatively minor state of non-compliance (ie 'B' rather than 'A') by June 2010, and this is to be further investigated over the next 12 months.

The particular focus in the project plans are in growth areas along the coast in the Wide Bay and in the eastern Darling Downs areas. Ergon Energy's project plans are also focusing on addressing areas of historically lower levels of substation security in the south west of the state.

Projects will be completed based on priorities set in accordance with Ergon Energy's risk management criteria outlined in Section 6.4.1.

In addition to the 19 bulk supply substations owned by Ergon Energy, there are 23 owned by Powerlink and one by Energex that directly support the network. Three of the non-Ergon Energy owned substations are approaching the limits of N-1 security and already have augmentation projects programmed to maintain appropriate N-1 security levels. While Ergon Energy maintains a planning interest in these bulk supply points, the status of the Energex and Powerlink substations are the subject of their own respective Network Management Plans or Annual Planning Reports.

Zone Substation Summary

The current and projected situations for Ergon Energy owned zone substations (excluding those dedicated to single customers) are summarised in the following tables.

Current Status (2003/04)

Zone Substations		CURRENT ACTUAL SECURITY LEVEL					Number Outside Target	Total Number
		N-1(A)	N-1(B)	N-1(C)	N	Max Load> NC Rating		
LOAD / TARGET SECURITY LEVEL	< 5 MVA / N	64	0	2	46	4	4	116
	5-15 MVA / N-1(C)	40	2	8	14	0	14	64
	15-25 MVA / N-1(B)	17	2	6	9	0	15	34
	>25 MVA / N-1(A)	11	3	3	5	0	11	22
							44	**236**

192 (81%) of Ergon Energy's zone substations currently meet the specified target security/load levels. Currently, 28 zone substations > 5MVA do not have any level of N-1 security. An additional 12 do have a level of N-1 security, but are in a minor state of non-compliance (ie. 'B' or 'C' rather than 'A' or 'B'). There are a further 4 less critical (<5MVA) substations where the maximum demand has exceeded the normal cyclic capacity of the installed transformers.

Projected Status (2009/10)

Zone Substations		PROJECTED ACTUAL SECURITY LEVEL					Number Outside Target	Total Number
		N-1(A)	N-1(B)	N-1(C)	N	Max Load> NC Rating		
LOAD / TARGET SECURITY LEVEL	< 5 MVA / N	68	0	2	50	0	0	120
	5-15 MVA / N-1(C)	66	2	4	0	0	0	72
	15-25 MVA / N-1(B)	37	8	1	0	0	1	46
	>25 MVA / N-1(A)	21	3	2	0	0	5	26
							6	**264**

To cater for industrial and urban load growth over the period to 2010, up to 28 new zone substations are planned. Projects are also programmed to address the new security level targets for zone substations such that all critical substations (>5MVA) will be at N-1 Security Level within five years. The main area of focus for these system security projects is in the

eastern Darling Downs, coastal growth areas particularly in the Wide Bay, Gladstone, Mackay and Townsville regions and some smaller western substations.

At this stage it is expected that a total of six substations will still be in a minor state of non-compliance at June 2010. This situation is to be further investigated over the next 12 months.

TRANSMISSION & SUBTRANSMISSION LINE SECURITY LEVELS

Transmission Lines

The situation for Ergon Energy owned transmission lines (supplying Ergon Energy owned bulk supply substations not dedicated to single customers) is summarised in the following table.

Current Status (2003/04)

Ergon Energy Owned Transmission Lines		CURRENT ACTUAL SECURITY LEVEL		Number Outside Target	Total Number
		N-1	N		
LOAD / TARGET SECURITY LEVEL	<15MVA / N	0	4	0	4
	>15MVA / N-1	11	4	4	15
				4	19

The transmission lines supplying fifteen (79%) of the Ergon Energy owned BSPs currently provide an N-1 level of security. Four bulk supply substations do not have N-1 security provided by the transmission lines supplying them. Augmentation works are programmed for three of the lines currently outside target and a detailed planning investigation is being undertaken for the fourth. These works are generally associated with the substation projects programmed for the Wide Bay and eastern Darling Downs areas.

No additional transmission lines are expected to be outside target by 2010.

Subtransmission Lines

The following tables summarise the current and projected situations for subtransmission lines supplying Ergon Energy's zone substations (excluding those dedicated to single customers):

Current Status (2003/04)

Subtransmission Lines		CURRENT ACTUAL SECURITY LEVEL			Number Outside Target	Total Number
		N-1	N	Max Load> N Rating		
LOAD / TARGET SECURITY LEVEL	<15MVA / N	46	150	11	11	207
	>15MVA / N-1	40	16	2	18	58
					29	265

236 (89%) of zone substations are currently supplied by Subtransmission lines which provide the specified target level of security for their load. There are 18 situations where the subtransmission lines supplying substation loads >15MVA do not currently provide N-1 security. There are also 13 situations where there is some uncertainty regarding the actual as-constructed rating of the lines and where the maximum demand may have exceeded the normal rating.

Projected Status (2009/10)

Subtransmission Lines		PROJECTED ACTUAL SECURITY LEVEL			Number Outside Target	Total Number
		N-1	N	Max Load> N Rating		
LOAD / TARGET SECURITY LEVEL	<15MVA / N	46	163	0	0	209
	>15MVA / N-1	61	4	0	4	65
					4	274

The majority of the cases where ratings are uncertain are in the South West region and detailed line surveys are programmed for these with remedial work to be carried out where and as required as a matter of priority. Augmentation projects are also programmed to provide N-1 security by 2009/10 to the 18 situations throughout the state which require but currently do not meet that level of security.

After allowing for both the projected works and forecast load growth, it is estimated that less than 2% of Ergon Energy's subtransmission feeders will be outside their target security levels by the end of 2009/10.

DISTRIBUTION FEEDER SECURITY LEVELS

The following table provides a summary of the results from the 2004 Distribution Capability Review in which all distribution feeders were examined with regard to the planning criteria. Results are presented for all feeders according to whether feeder constraints are exceeded with respect to voltage regulation or capacity.

Current Status (2003/04)

Category	Number	%
Total Feeders	1739	100%
Capacity Constraints	468	27%
Voltage Constraints	242	14%
Total Constraints	591	34%

Note that the term 'constraint' in this context refers to non-compliance with the planning criteria. The majority of capacity constraints are in fact related to feeder maximum demand loads exceeding the '3 into 2' target security level criterion rather than feeder ratings being exceeded under normal operating conditions. Feeders are deemed to be 'voltage constrained' when network modelling indicates that the voltage regulation criteria used in planning the HV distribution network may be exceeded during the maximum demand period. (Capacity constraints coincide with voltage constraints on some feeders).

While these constraints are distributed through all Ergon Energy regions, the Wide Bay region currently has the largest proportion of HV feeders exceeding planning criteria. Apart from specific feeder augmentation works, this situation will also be alleviated by the new substation works programmed for this Region which will also involve the establishment of several new feeders to reduce load on existing feeders.

Projected Status (2009/10)

Category	Number	%
Total Feeders	1913	100%
Capacity Constraints	196	10%
Voltage Constraints	150	8%
Total Constraints	292	15%

The major improvements projected by the end of 2009/10 reflect the implementation of strategies outlined in Section 6.2.2 along with significantly increased augmentation expenditure, which includes the establishment of an estimated 174 new distribution feeders.

7.3. Reliability of Supply

The following table shows budgeted expenditure for 2004/05, and projected spends for 2005/06 through to 2009/10.

Direct Reliability Capital Expenditure	Budget	Forecast				
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
	$, 000	$,000	$,000	$,000	$,000	$,000
Reliability Improvement	9,040	30,213	58,273	61,799	62,152	31,310

In addition to these direct reliability works, network augmentation, ageing asset replacement and refurbishment expenditure, along with virtually all corporation initiated network capital expenditure as well as maintenance expenditure, have a positive impact on reliability performance.

The following table shows budgeted expenditure in these categories for 2004/05 and projected spends for 2005/06 through to 2009/10.

CAPITAL EXPENDITURE	Budget	Forecast				
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
	$, 000	$,000	$,000	$,000	$,000	$,000
Augmentation	89,196	113,564	116,271	126,979	134,037	144,578
Ageing Asset Replacement	134,085	146,230	141,535	142,673	138,999	139,785
Reliability Improvement	9,040	30,213	58,273	61,799	62,152	31,310
Other	5,378	8,768	8,863	8,819	8,476	7,760
Load Energy Management	1,337	377	1,545	1,364	1,435	1,468
Total Corporation Initiated Capital Works	239,036	299,153	326,487	341,633	345,099	324,901

MAINTENANCE EXPENDITURE	Budget	Forecast				
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
	$, 000	$,000	$,000	$,000	$,000	$,000
Maintenance						
Lines	93,279	91,824	93,212	92,934	78,877	79,658
Vegetation	56,096	60,624	59,613	56,135	54,794	55,066
Substations	20,888	19,951	20,318	20,363	20,948	21,351
Meters	2,195	2,576	3,116	3,144	3,429	3,933
Total Maintenance	172,458	174,974	176,260	172,576	158,049	160,007

7.3.1 Current Performance

The reliability performance at 30 June 2004 (excluding all events outside Ergon Energy's control) is shown in the following table, in total (EE) and by Region:

		Actuals NW Rgn SAIDI, SAIFI, CAIDI						
	Jun04 Actuals	EE	FN	NQ	MK	CA	WB	SW
SAIDI	All - (excluding IS category)	564	566	374	515	540	731	644
	Urban Distribution (UR)	240	281	174	269	200	291	304
	Short Rural Distribution (SR)	636	614	787	650	401	746	646
	Long Rural Distribution (LR)	1,419	1,268	941	874	1,332	2,081	1,337
SAIFI	All - (excluding IS category)	5.1	4.8	4.0	5.4	4.4	6.4	5.9
	Urban Distribution (UR)	2.8	2.6	2.2	4.1	2.3	3.4	3.6
	Short Rural Distribution (SR)	5.8	5.2	7.7	6.1	3.8	6.9	5.7
	Long Rural Distribution (LR)	10.4	10.0	8.6	6.9	8.7	13.9	11.0
CAIDI	All - (excluding IS category)	110	117	93	96	124	114	110
	Urban Distribution (UR)	84	109	78	65	89	85	84
	Short Rural Distribution (SR)	110	118	102	107	105	107	113
	Long Rural Distribution (LR)	137	127	109	127	152	150	122

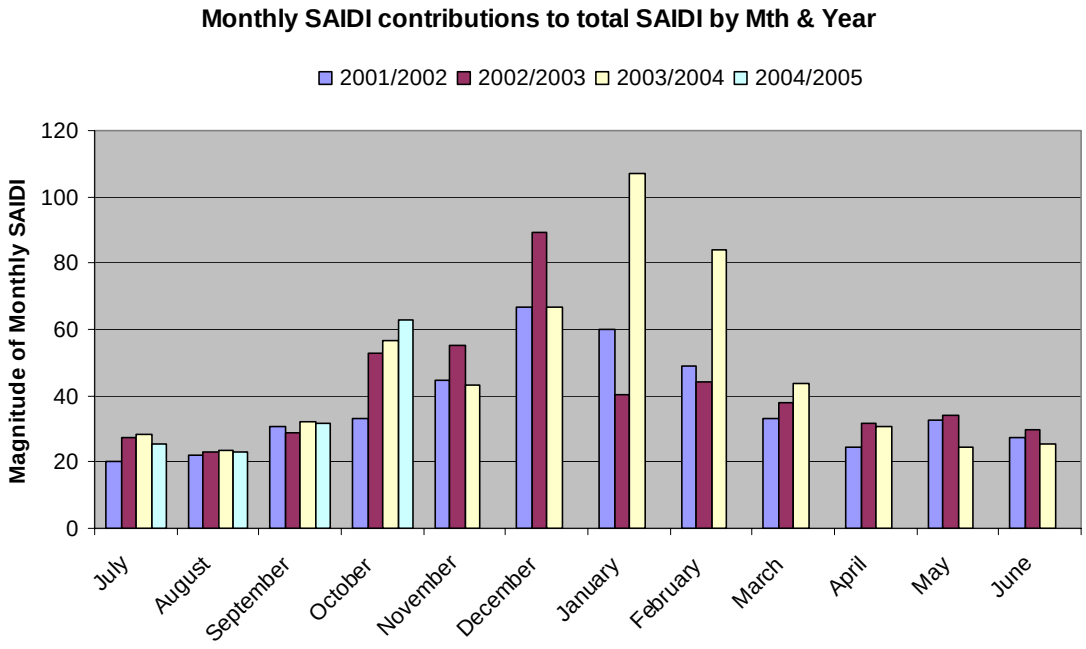
To allow a comparison against the MSS targets shown in Section 6.3.2, a 2.5 beta analysis has been completed in accordance with the Electricity Industry Code to exclude Major Event Days, ie. those on which there were major disruptions to a large part of the network.

The adjusted performance is shown below.

Jun04 Actuals (with 2.5beta exclusions)

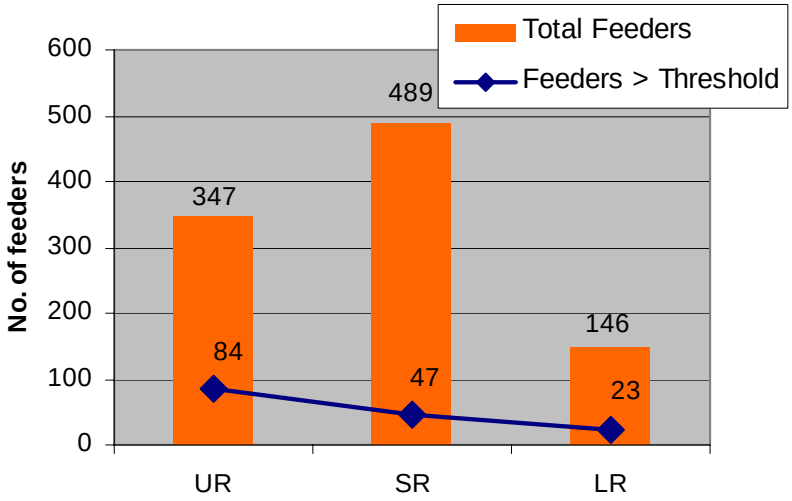
		Actuals NW Rgn SAIDI, SAIFI, CAIDI						
	Jun04 Actuals	EE	FN	NQ	MK	CA	WB	SW
SAIDI	All - (excluding IS category)	504	538	364	489	470	582	579
	Urban Distribution (UR)	212	228	170	243	157	257	277
	Short Rural Distribution (SR)	583	600	770	625	339	604	599
	Long Rural Distribution (LR)	1,214	1,253	900	830	1,203	1,527	1,132
SAIFI	All - (excluding IS category)	4.8	4.6	3.9	5.2	4.0	5.6	5.5
	Urban Distribution (UR)	2.6	2.2	2.2	3.8	2.0	3.1	3.4
	Short Rural Distribution (SR)	5.5	5.1	7.5	5.9	3.4	6.1	5.4
	Long Rural Distribution (LR)	9.5	9.8	8.5	6.7	8.2	11.6	10.2
CAIDI	All - (excluding IS category)	110	117	93	96	124	114	110
	Urban Distribution (UR)	84	109	78	65	89	85	84
	Short Rural Distribution (SR)	110	118	102	107	105	107	113
	Long Rural Distribution (LR)	137	127	109	127	152	150	122

The network SAIDI performance by month, highlighting the seasonal storm effects, and comparison of monthly SAIDI from year-to-year, is shown in the following chart. Note: The numbers are not adjusted for 2.5 beta events:

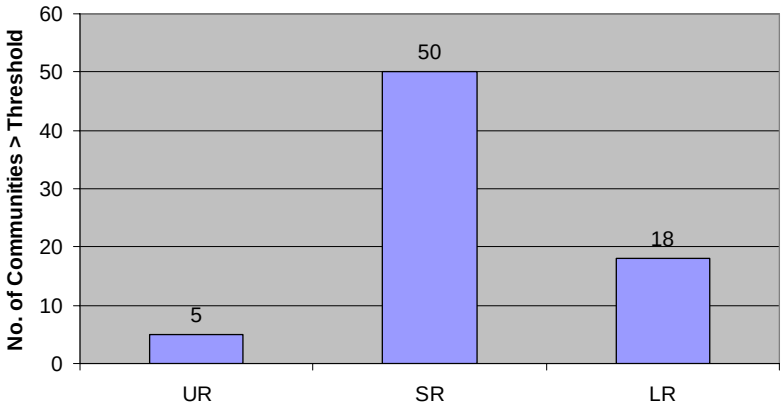


The Electricity Industry Code requires an analysis of the historical reliability performance for the previous five years. Ergon Energy does not have reliable data for the previous five years and as a consequence only data from 2001/02, 2002/03, 2003/04 and the current year are shown above. Future Network Management Plans will progressively address this gap.

Based on the statistical work outlined in Section 6.3, the number of feeders performing above (ie. worse than) the feeder thresholds and the number of communities performing above community thresholds in June 2004 were as follows:



UR = Urban, SR = Short Rural, LR = Long Rural



It is expected that the reliability improvement initiatives being adopted will provide the necessary depth of improvement across all feeder categories to meet the respective targets required under the Minimum Service Standards across the period to 2009/10.

Details of the feeders above the thresholds will be provided in Part B of the Network Management Plan to be published in July 2005.

7.4. Asset Management

The following tables and graphs provide a summary of the status of key maintenance programs against plan for the 2004/05 year. Expenditure levels for 2003/04 are also provided.

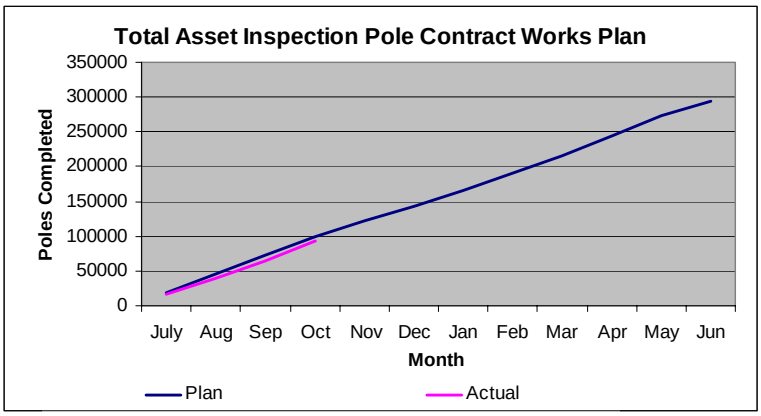
7.4.1 Lines Inspections

Ergon Energy has implemented a comprehensive line inspection regime which sees all line assets inspected within a three year cycle. The following table shows expenditure for 2003/04 and the 2004/05 budget and expenditure to date.

Lines Inspections

Expenditure 2003/04	Annual Budget 2004/05	YTD Actual Oct-04
$39,236,215	$37,987,000	$9,745,000

The 2004/05 line inspection program is running at 93.2% YTD at October. Plans are in place to ensure that the program for 2004/05 is completed in full.



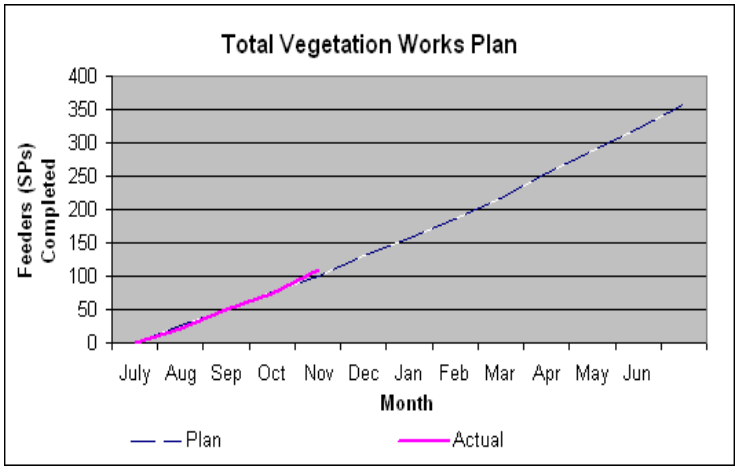
7.4.2 Vegetation Management

Ergon Energy has implemented a comprehensive vegetation management program. The following table shows expenditure for 2003/04 and the 2004/05 budget and expenditure to date.

Vegetation Management

Expenditure 2003/04	Annual Budget 2004/05	YTD Actual Oct-04
$49,437,000	$56,096,000	$17,371,000

The 2004/05 vegetation management program is running at 107% of plan YTD at October. Plans are in place to ensure that the program for 2004/05 is completed in full.



7.4.3 Substations Maintenance

The following table shows Substations Preventative Maintenance expenditure for 2003/04 and the 2004/05 budget and expenditure to date.

Substation Maintenance (Preventive)

Expenditure 2003/04	Annual Budget 2004/05	YTD Actual Oct-04
$9,174,832	$13,943,448	$3,200,703

The 2004/05 substations program is running at 64% of plan YTD at October. Plans are in place to ensure that the program for 2004/05 is completed in full.

7.4.4 Ageing Asset Replacement and Refurbishment

The following table shows expenditure for 2003/04, the 2004/05 budget and expenditure to date for aged assets, defects and refurbishment.

	Expenditure 2003/04 $, 000	Annual Budget 2004/05 $, 000	YTD Actual Oct-04 $, 000
Line Refurbishment	$87,139	$77,350	$32,712
Distribution Ageing Asset Rep	$7,715	$6,685	$1,688
Subtransmission Network Ageing	$19,638	$49,696	$12,022
Transmission Network Ageing	$21	$345	$26
Total Asset Replacement & Refurbishment	**$114,513**	**$134,076**	**$46,448**

The 2004/05 programme is running at 98% of plan YTD at October and is expected to be completed in full at the end of the year.

Ergon Energy manages all defects arising from its inspection program within a documented policy consistent with safety, industry codes and best practice. As at October 2004, Ergon Energy had no defects outside of policy.

7.4.5 Summer Preparedness

As at the end of October, the status of the 2004/05 Summer Preparedness Plan was as follows:

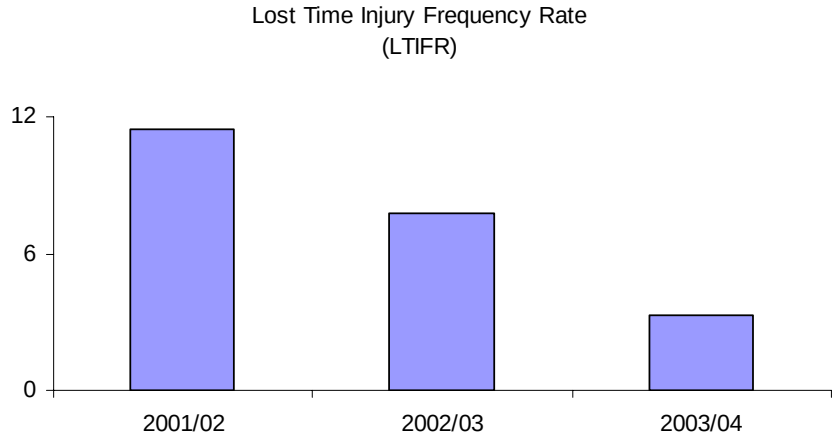
Twelve of the 44 projects contained within the Summer Preparedness Plan had been completed, with the status of the remaining 31 being reviewed weekly. These projects, which total almost $13 million, include the new power station at Windorah, the Moranbah substation, providing additional switching capability to the 11KV feeder to Magnetic Island off Townsville, and the Ayr Nursing Home CARE works.

In addition, 29 of the 39 actions contained in the Summer Preparedness Plan were complete and the rest are close to finalisation. Further contingency plans were being developed as required to deal with any areas of concern that were being identified by the business.

7.5. Safety and Environment

7.5.1 Safety

Ergon Energy was awarded an overall five-star National Safety Council of Australia (NSCA) grading in April 2004. The accreditation, up one star from the previous year to the highest grading possible, provides independent recognition of the quality of Ergon Energy's Health and Safety Management System and safety performance improvement in terms of lost time injuries. Over the last financial year the Lost Time Injury Frequency Rate (LTIFR) reduced from 7.8 to 3.3 and the Injury Illness Statistical Index (IISI) reduced from 92 to 23.



In August 2004, the corporation's Health and Safety Management System achieved accreditation from the Electrical Safety Office, formally recognising that the system complies with the requirements of the Electrical Safety Act 2002 and the Electrical Safety Regulation 2002. The system has been developed in accordance with the Australian Standard - AS4801:2001 Occupational Health and Safety Management Systems. The basis of this standard is continuous improvement in safety management.

7.5.2 Environment

Ergon Energy is maintaining certification to the international Environmental Management System standard ISO 14001 with the last external audit conducted by NATA Certification Services International (NCSI) in October 2004. The results highlighted progressive improvements in environmental performance across the organisation.

The entire business first achieved certification in March 2003. The milestone laid the foundations for ongoing auditing and review and environmental training, as well as environmental risk assessment and management. As an important strategic tool, the ongoing certification process is being used to manage environmental risks systematically and to go beyond compliance to strive for continual improvement in environmental performance.

7.6. Remote Systems

7.6.1 Isolated Generation

The following table shows generation expenditure for 2003/04 and the 2004/05 budget and expenditure to date. The 2004/05 program of works is running at 86% of plan YTD at October and is expected to be completed at the end of the year.

Generation Capital Expenditure

Expenditure 2003/04	Annual Budget 2004/05	YTD Actual Oct-04
$14,367,000	$22,929,000	$5,947,000

7.6.2 Stand-alone Power Supplies

A total of 19 isolated sites across northern Australia, from National Parks to large working properties are now supplied with the Ergon Energy developed stationpower® systems,

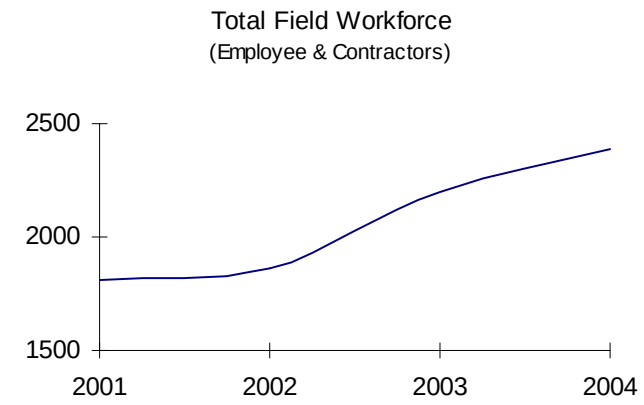
Ergon Energy has also supplied 30 Bushlight solar stand-alone power supply systems, installing 23 systems across the north - in the Kimberley, Alice Springs, Tennant Creek, Top End and Gulf of Carpentaria regions. Many of these communities previously relied solely on diesel or small petrol generators for electricity.

Revenue for the 2003/04 financial year was derived from Bushlight, stationpower® and smaller stand-alone systems projects. Projections showed continued demand in these areas. With Queensland remaining as Ergon Energy's core market, the future sees further development into broader national markets.

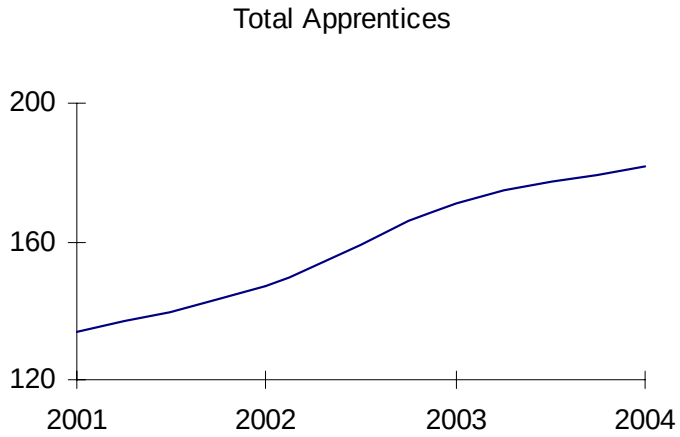
7.7. Business Capability

7.7.1 Human Resourcing

All of the 2003/04 human resourcing initiatives were completed with the exception of the increase in key internal capability. In this area a 6.5% increase was achieved, against a targeted increase of 7.8%. Ergon Energy has increased its total field workforce – of both permanent employees and contract resources – by over 30% in the last four years.



Apprentice intakes are also increasing, with 80 positions currently being recruited for commencement in February 2005.



7.7.2 Data and Systems

The current status of the key network data applications is described below:

Smallworld GIS: The Common Layout Design Tools were brought into service in early 2004. Since then all work by distribution designers has been carried out in this environment. Currently a significant number of functionality issues that will improve designer efficiency and enable enhanced reporting are being resolved. A number of data issues are also being addressed, for example, re-aligning assets with the updated digital cadastre adopted in 2003, completing importation of data from the legacy GIS's, incorporation of new site identification (pole numbers) assigned during the first line asset inspection cycle and continued manual data alignment (required because of delayed delivery of automated data synchronisation tools).

FeederStat: FeederStat continues to evolve, and has recently been enhanced to meet requirements for the Summer Preparedness Plan and more stringent customer service standards for supply restoration. Issues related to the collection of data from field crews were addressed as part of the 2004 Summer Preparedness Plan. A review of DMS needs and capability will be conducted in 2005, and decisions about the long term use of FeederStat, or its replacement, will be made at that time.

Schematic Diagrams: Operational schematics are produced from core data systems. A Schematics Strategy has been completed, and provides guidance for addressing urgent deficiencies, developing a process for managing schematics and for developing a common look

and feel for schematics across the business. A final decision on the use of Smallworld for producing and maintaining operating schematics will be made early in 2005.

SAP (Maintenance Management): Development of this system to support NAPM and ongoing maintenance activities is continuing.

PQMS (Power Quality Management System): A framework has been established for the collection, storage and management of a variety of historical load data (including half-hourly energy values and quality of supply data). As data becomes available through various initiatives such as existing smart metering, SCADA enhancements and sentinel devices, PQMS will become a significant centralised source of key data for planning and related functions.

Protection Settings Database: A centralised Protection Settings Database has been commissioned recently, to provide a single repository for all protection settings. This database will facilitate improved management of protection settings, including periodic reviews and ready availability of alternative settings for contingency situations.

Electrical Network Model: The whole of the high voltage electrical supply network is now modelled in a common network analysis platform, with electrical parameter data validated for most areas. This enables planners to investigate electrical performance and produce development plans by simulating operation of the supply network for a range of scenarios.

8. EXPENDITURE FORECASTS

The following tables summarise Ergon Energy's proposed capital and operating expenditure programs for 2004/05 and the following five years as currently included in the Ergon Energy Corporate Plan. While the programs have been developed generally in accordance with the strategies and policies outlined in Section 6 of this document, the final assessment of the impacts of the EDSD recommendations is still being finalised as part of the 2005/06 budgeting process and for submission to the QCA.

Consequently the final expenditure programs will be subject to a regulatory determination by the QCA and agreement by Ergon Energy's Shareholding Ministers and, where applicable, to Board approval. Further, specific projects/works contemplated in this document, unless expressly stated as already being 'committed', represent Ergon Energy's intention. Commitment to these projects/works remains subject to appropriate internal and external approvals and specific detailed review at the relevant time.

8.1. Five Year Capital Program

CAPITAL EXPENDITURE	Budget 2004/05	Forecast 2005/06	2006/07	2007/08	2008/09	2009/10
	$, 000	$,000	$,000	$,000	$,000	$,000
System Assets						
Augmentation	89,196	113,564	116,271	126,979	134,037	144,578
Ageing Asset Replacement	134,085	146,230	141,535	142,673	138,999	139,785
Reliability Improvement	9,040	30,213	58,273	61,799	62,152	31,310
Other	5,378	8,768	8,863	8,819	8,476	7,760
Load Energy Management	1,337	377	1,545	1,364	1,435	1,468
Customer Requested Works	145,238	155,625	159,650	161,250	166,694	171,238
Isolated Generation	22,929	23,100	21,800	21,600	20,300	21,500
Total System Capex	407,203	477,879	507,937	524,483	532,093	517,639
Non System Assets						
Capitalised Projects	34,586	22,916	17,938	17,938	17,938	17,938
Computer Facilities	14,058	14,606	8,303	9,328	8,405	7,278
Vehicles & Mobile Plant	33,693	25,625	25,625	26,425	26,922	22,243
Land & Buildings	11,958	12,300	12,300	12,300	12,300	12,300
Other Fixed Assets	9,873	1,208	1,116	957	957	1,160
Other Unclassified Acquisitions	-	1,025	1,025	1,025	2,050	2,050
Total Non System Capex	104,168	77,680	66,306	67,971	68,571	62,967
Total Capital Expenditure	511,371	555,559	574,242	592,454	600,663	580,606

(All dollar amounts are shown in 2004/05 dollars)

8.2. Five Year Operating Program

OPERATING EXPENDITURE	Budget 2004/05	Forecast 2005/06	2006/07	2007/08	2008/09	2009/10
	$, 000	$,000	$,000	$,000	$,000	$,000
Maintenance						
Lines	93,279	91,824	93,212	92,934	78,877	79,658
Vegetation	56,096	60,624	59,613	56,135	54,794	55,066
Substations	20,888	19,951	20,318	20,363	20,948	21,351
Meters	2,195	2,576	3,116	3,144	3,429	3,933
Total Maintenance	172,458	174,974	176,260	172,576	158,049	160,007
		-	-	-	-	-
Operations		-	-	-	-	-
Network Operations	13,131	10,501	10,610	10,551	10,755	10,875
Customer Service	21,927	23,434	24,225	24,567	25,660	26,539
		-	-	-	-	-
Total Operations	35,058	33,935	34,835	35,118	36,415	37,415
		-	-	-	-	-
Total Opex	207,516	208,910	211,095	207,695	194,463	197,421

(All dollar amounts are shown in 2004/05 dollars)

8.3. Committed Projects Greater Than $1 Million

Region	Category	Description	Estimated Project Cost	Nominal Commissioning Date
CA	Subtransmission - Augmentation	Establish a new 2 x 10 MVA 66/22kV substation at Agnes Waters	$16,970,000	30/11/2006
CA	Subtransmission - Augmentation	Establish a new 66kV Feeder from South Gladstone Bulk Supply Substation to Calliope Zone Substation.	$4,129,306	30/11/2005
CA	Distribution - Augmentation	Reconductor backbone, voltage regulator and/or distributed generation. Barcaldine &Alpha	$2,867,717	30/06/2005
CA	Distribution - Augmentation	Low Voltage Unspecified Augmentation	$1,244,368	30/06/2005
CA	Line Refurbishment	Defect Refurbishment	$10,460,790	30/06/2005
FN	Transmission - Augmentation	Build Yalkula-Lakeland 132kV line, Yalkula 132kV Switching station & Lakeland 132/66/22kV Substation	$26,400,000	30/06/2004
FN	Subtransmission - Augmentation	Build Lakeland - Helenvale 66kV line	$2,200,000	30/06/2004
FN	Subtransmission - Augmentation	Atherton Transformer Augmentation. Replace 2 x 7.5 MVA 66/22kV transformers with a 40 MVA unit.	$1,627,634	28/02/2005
FN	Subtransmission - Network Ageing	Improve control of network. Telco project - installation of fibre optic cables in Cairns area	$1,900,365	30/06/2005
FN	Distribution - Augmentation	Low Voltage Unspecified Augmentation	$1,334,165	30/06/2005
FN	Distribution - Ageing Asset Replacement	Ageing Asset Replacement projects	$2,095,892	30/06/2005
FN	Distribution - Ageing Asset Replacement	Replace a section of 22kV submarine cable at Dunk Island	$1,714,500	30/06/2005
FN	Line Refurbishment	Defect Refurbishment (P1 / P2)	$6,788,483	30/06/2005
MK	Transmission - Augmentation	T141 Pioneer Valley SubStn -Install 2nd 66kV bus associated with 2nd 132/66kV TF & new 66kV feeder bay for McKinley Ck line.	$1,651,779	30/11/2004
MK	Subtransmission - Augmentation	T38 Mackay - Tennyson St 3rd 33kV line	$3,506,000	30/06/2005
MK	Subtransmission - Augmentation	West Mackay SubStn - Augment TFsPurchase and install two new 20MVA TFs to replace existing 2 x 12.5MVA TFs.	$2,117,114	30/11/2004
MK	Subtransmission - Augmentation	Planella SubStn. Install new 11kV switchboard to increase available 11kV feeders from 2 to 4.	$1,925,252	30/01/2005
MK	Subtransmission - Network Ageing	Build 20km conc line with "Cherry" Conductor & OHEW (Inneston-Ilbilbie)	$4,900,000	28/02/2005
MK	Distribution - Reliability Improvement	Network Performance Monitoring Project. Installation of monitoring devices throughout Ergon network	$1,514,136	30/06/2005
MK	Line Refurbishment	Defect Refurbishment (P1 / P2)	$4,796,125	30/06/2005
NQ	Transmission - Augmentation	Install a new 66kV AFLC injection unit in Townsville at Dan Gleeson/ TPSS sub.	$1,091,466	30/09/2005
NQ	Subtransmission - Augmentation	Townsville Port Sub. Install 2 x 25MVA TFs & 11kV switchboard at TPSS, connect to 11kV distribution network.	$4,083,747	30/11/2005
NQ	Subtransmission - Augmentation	Ross Plains Sub. Upgrade existing old switchboard with a new 10 CB board, install new TF cables	$1,604,505	28/02/2005
NQ	Subtransmission - Augmentation	Home Hill Sub. Replace the existing 13MVA TF with 1 x 25MVA unit. This will provide 2 x 25MVA TF capacity.	$1,652,524	28/02/2005
NQ	Subtransmission - Network Ageing	Townsville CBD. Replace leaking gas-filled cable Approx 1.1km of .185mm AL	$3,247,683	30/11/2005
NQ	Distribution - Augmentation	NO,Townsville Port Switching Station Zone Substation. Establish New Feeders	$2,032,788	30/06/2006
NQ	Distribution - Augmentation	Low Voltage Unspecified Augmentation	$1,747,857	30/06/2005
NQ	Distribution - Ageing Asset Replacement	Reconductor, install Darverters, 892 poles SWER refurbishment	$1,409,759	30/06/2005
NQ	Distribution - Ageing Asset Replacement	Substantial reconductor, install Darverters, 647 wood poles. SWER spurs refurbishment	$1,473,809	30/06/2005

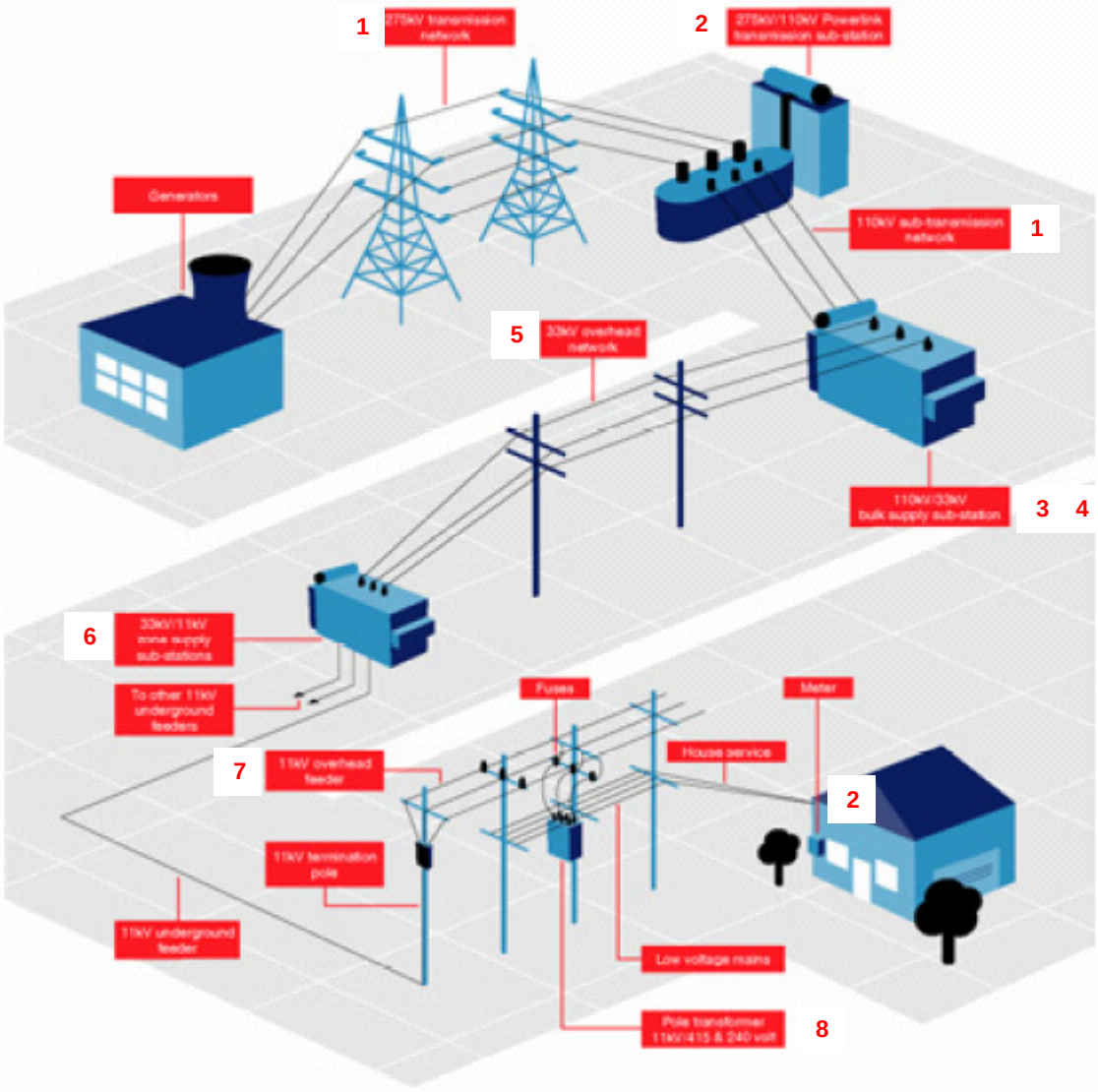
Region	Category	Description	Estimated Project Cost	Nominal Commissioning Date
SW	Transmission - Augmentation	Install new 2 x 30 MVA 110/11kV sub at Kearneys Springs in Toowoomba.	$15,100,000	30/04/2006
SW	Transmission - Augmentation	Warwick 2nd 110/33kV 50MVA Transformer. Replace 20MVA 110/33kV transformer with a 50MVA unit	$2,137,795	28/02/2006
SW	Subtransmission - Augmentation	Establish Torrington to Meringandan 33kV fdr	$3,800,000	30/06/2004
SW	Subtransmission - Augmentation	West Warrick 2nd Transformer. Install new additional 12.5MVA 33/11kV TF and an additional 11kV feeder bay	$2,181,989	1/03/2005
SW	Subtransmission - Augmentation	Install new additional 25MVA 33/11kV transformer at Torrington.	$1,199,590	30/12/2004
SW	Subtransmission - Network Ageing	Redevelopment of ME73 Oakey 33/11kV Substation	$9,935,000	30/06/2005
SW	Subtransmission - Network Ageing	Telco project - installation of fibre optic cables in Toowoomba area	$1,937,378	30/06/2005
SW	Distribution - Augmentation	Low Voltage Unspecified Augmentation	$1,275,739	30/06/2005
SW	Line Refurbishment	Defect Refurbishment (P1 / P2)	$13,512,257	30/06/2005
WB	Transmission - Augmentation	Bundaberg Transformer Augmentation. Provide a 3rd 132/66kV 70 MVA transformer & associated 132 & 66kV fdr bays at Bundaberg BSP	$2,586,549	30/06/2005
WB	Subtransmission - Augmentation	Establishment of a new 66/11kV zone substation with 2 x 15/20 transformers at Bargara.	$6,426,087	31/10/2005
WB	Subtransmission - Augmentation	Establish a new 66/11kV substation at Pt Vernon and connect in all existing 11kV feeders (use TFs ex-Torquay)	$5,022,662	31/10/2005
WB	Subtransmission - Network Ageing	Redevelop Rocky St zone substation in Maryborough	$5,923,803	30/06/2004
WB	Subtransmission - Augmentation	Erect approx. 8 km of dual circuit 66kV line from South Bundaberg to proposed Bargara substation including 66kV feeder bays at East Bundaberg substation.	$2,430,263	31/10/2005
WB	Subtransmission - Augmentation	Extend existing 66kV line to Pialba & Pt Vernon and reenergise to 66kV (includes U/Ging two 11kV feeders for 0.5km to free line route out of Pialba for 66kV line).	$1,255,327	31/08/2005
WB	Subtransmission - Augmentation	Additional Reactive Support for T59 supply area. Provision of five 5MVAr 11kV capacitor banks in the Maryborough, Hervey Bay area.	$1,101,731	30/11/2004
WB	Subtransmission - Augmentation	Torquay TF Augmentation. Replace 2 x 16MVA TFs with 2 x 35MVA units.	$2,314,876	30/12/2004
WB	Subtransmission - Network Ageing	Telco project - installation of fibre optic cables in Bundaberg area	$1,780,371	30/06/2005
WB	Line Refurbishment	Defect Refurbishment (P1 / P2)	$7,487,459	30/06/2005
Ergon Wide	Distribution - Augmentation	CARE Projects	$1,124,272	30/06/2005
Ergon Wide	Generation	Bamaga - Replace sets 3 & 4	$1,275,624	30/11/2004
Ergon Wide	Generation	Bamaga - New PS	$11,166,426	31/07/2007
Ergon Wide	Generation	Camooweal - New PS	$3,987,504	31/07/2006
Ergon Wide	Generation	Lockhart River - New Power Station	$4,537,107	31/07/2005
Ergon Wide	Generation	Pormpuraaw - New Power Station	$5,295,726	31/08/2006
Ergon Wide	Generation	Windorah - New Power Station	$3,689,433	30/06/2004
Ergon Wide	Subtransmission - Other	Install Ergon SCADA master station 04/05	$10,859,411	30/06/2005

9. APPENDICES

9.1. Role of Distribution in the Supply of Electricity to Customers

The following diagram has been extracted from the the final report from the Queensland Government independent review of electricity distribution in Queensland – entitled *'Electricity Distribution and Service Delivery for the 21st Century'* (EDSD).

Chart 3.1B - Role of Distribution in the Supply of Electricity to Customers



The following definitions provide a brief explanation of key elements of the network:

1. **Transmission Network:** The electricity supply network operating at or above a nominal voltage of 110kV. This term is used regardless of ownership.
2. **Connection Point (CP):** The agreed point of supply established between Ergon Energy's network and Powerlink, an embedded generator or a customer.
3. **Bulk Supply Point (BSP):** A point (normally associated with a bulk supply substation) in the electricity supply network where supply is provided to the subtransmission network.

4. **Bulk Supply Substation:** A site incorporating equipment that provides control and voltage transformation from the transmission network to the subtransmission network, regardless of ownership.
5. **Subtransmission Network:** Ergon Energy's electricity supply network operating and supplying zone substations or customer connection points at a nominal voltage of 33kV or 66kV.
6. **Zone Substation:** A site incorporating equipment that provides control and voltage transformation from the subtransmission or transmission network to the distribution network, regardless of ownership. ***Note:*** *A site that provides supply to both the subtransmission and distribution networks incorporates both functions and therefore is both a bulk supply and a zone substation. Sites that provide supply directly to customers at subtransmission voltage are normally listed with zone substations.*
7. **Distribution Network:** Ergon Energy's electricity supply network operating and supplying distribution substations or customer connection points at 11kV, 22kV *or where so designated, 33kV* nominal voltage and including 11, 12.7 and 19.1kV Single Wire Earth Return systems.

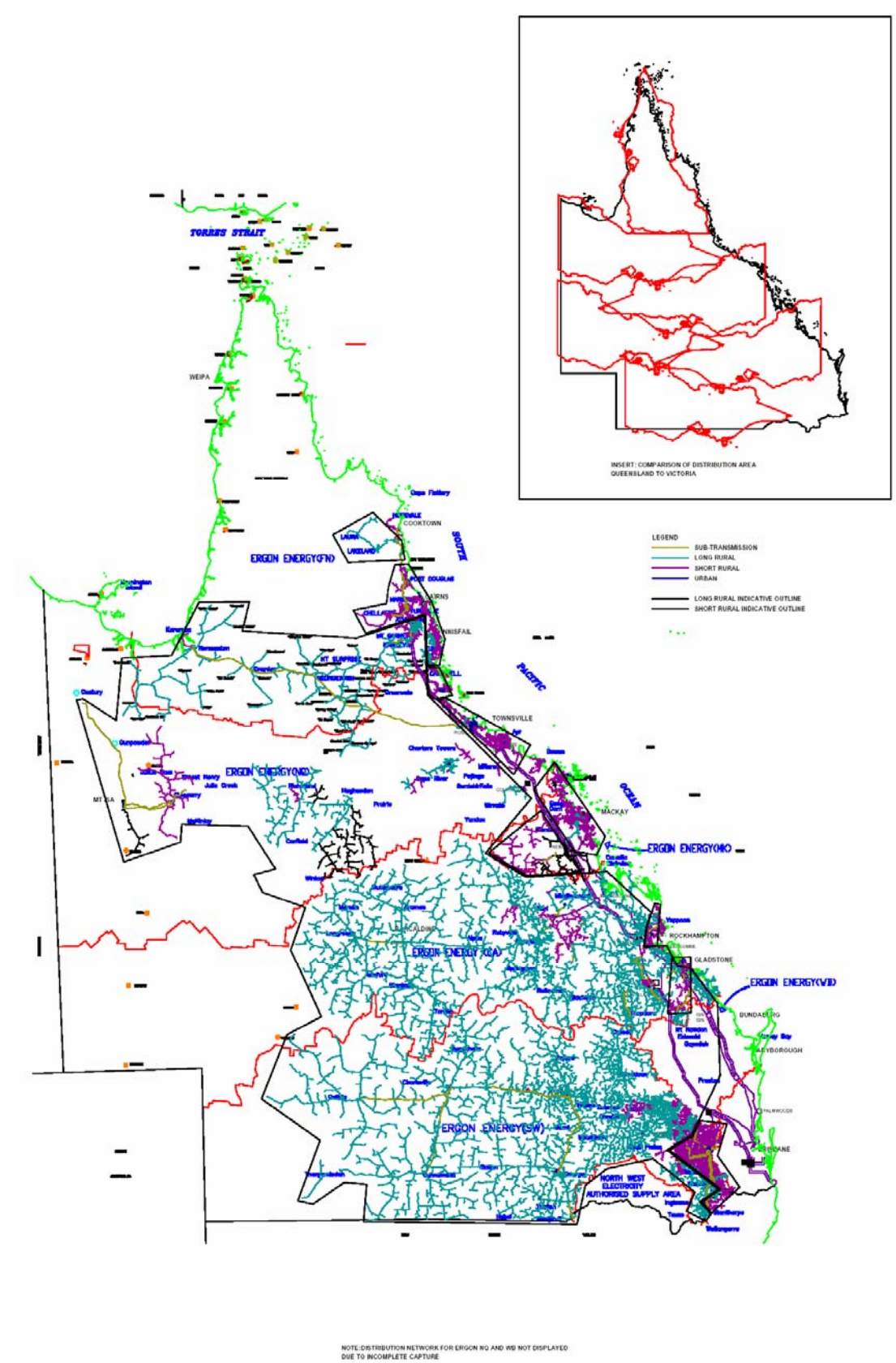
   Note: *Depending on function, a 33kV line may constitute part of the subtransmission network, the distribution network or both.*

   Note: *Sites that provide supply directly to customers at transmission voltage are normally listed with bulk supply substations.*
8. **Distribution Substation:** An assemblage of equipment providing control and voltage transformation from the distribution network to the low voltage (415/240V) network.

Security Level: Denotes the inherent security of supply provided by major network components as determined by the extent of duplication or redundancy of primary serial elements and their associated secondary protection and control systems.

9.2. Ergon Energy's Subtransmission and Rural Distribution Network

Ergon Energy's network is dominated by the western system, as shown. The diagram also illustrates the radial nature of the subtransmission and rural distribution networks.



9.3. Abbreviations, Definitions and Units of Measures

AIDM	Asset Inspection and Defect Management
AAAC	All Aluminium Alloy Conductor
AAC	All Aluminium Conductor
ACSR	Aluminium Conductor Steel Re-inforced Conductor
BSP	Bulk Supply Point/s or Substation/s
CARE	Cyclone Area Reliability Enhancement program
DMS	Distribution Management System
DNSP	Distribution Network Service Provider
DOUS	Distribution Use Of System
EBA	Enterprise Bargaining Agreement
ERP	Enterprise Resource Planning
EDSD	Electricity Distribution and Service Delivery Report
EMF	Electromagnetic Field
ESAA	Electricity Supply Association of Australia
ESO	Electrical Safety Office
GSL	Guaranteed Service Level
GIS	Geographical Information System
HDBC	Hard Drawn Bare Copper Conductor
ISO	International Standards Organisation
IT&T	Information Technology and Telecommunications
MD	Maximum Demand
MSS	Minimum Service Standards
NAPM	Network Asset Preventative Maintenance
NATA	National Association of Testing Authorities
NEC	National Electricity Code
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NIEIR	National Institute of Economic and Industry Research
NSCA	National Safety Council of Australia
OGOC	Office of Government Owned Corporations
OHEW	Overhead Earth Wires
POE	Probability of Exceedance
QCA	Queensland Competition Authority
SCI	Statement of Corporate Intent
SPS	Stand-alone Power Supply
SCADA	Supervisory Control and Data Acquisition
SWER	Single Wire Earth Return

SAIDI	System Average Interruption Duration Index. Network reliability performance index, indicating the total minutes, on average, that customers are without electricity during the relevant period (minutes).
SAIFI	System Average Interruption Frequency Index. Network reliability performance index, indicating the average number of occasions each customer is interrupted during the relevant period (interruptions).
CAIDI	Customer Average Interruption Duration Index. Network reliability performance index, indicating the interruption duration that each customer experiences on average (minutes) per interruption.
LTIFR	Lost Time Injury Frequency Rate. Number of injuries per million hours worked over the 12 month reporting period.
IISI	Injury and Illness Statistics Index. The measure is a product of LTIFR and average days lost per injury for the 12 month reporting period.

V	volt	the unit of potential or electrical pressure
kV	kilovolt	one kV equals 1,000 volts
W	watt	a measure of the power present when a current of of one ampere flows under a pressure of one volt
VA	volt amperes	a measure of the apparent power flowing for which equipment must be rated
kW	kilowatt	one kW equals 1,000 watts
MW	megawatt	one MW equals 1,000 kilowatts
MVA	mega volt amperes	one MVA equals 1 million volt amperes
kWh	kilowatt hour	the standard 'unit' of electricity which represents the consumption of electrical energy at the rate of one kilowatt over a period of one hour
MWh	megawatt hour	one MWh equals 1,000 kilowatt hours
GWh	gigawatt hour	one GWh equals 1,000 megawatt hours or one million kilowatt hours
HV	high voltage	alternating current above 1,000V
LV	low voltage	alternating current above 32V and not exceeding 1,000V