Access Arrangement Information

for the

South West Interconnected System

owned by

Western Power Corporation

Submission to the Economic Regulation Authority

Contents

Executive summary

Purpose and scope of submission

In accordance with the Network Access Code 2004 ("the Code"), Western Power must propose an access arrangement which describes the terms and conditions on which users (typically retailers and generators) can obtain access to Western Power's South West interconnected network. The Economic Regulation Authority ("the Authority") is the regulator responsible for ensuring that Western Power's proposed access arrangement complies with the Code.

The development of the Code and independent economic regulation is the latest step in the reform of the electricity industry in Western Australia that commenced 10 years ago. The objective of industry reform is clear – it is to provide Western Australians with safe and reliable electricity at competitive prices – and is strongly supported by Western Power. Western Power's proposed access arrangement builds on the existing open access arrangements, which have provided transmission and distribution network access services since 1997.

To explain and substantiate Western Power's proposed access arrangement, the company must also submit to the Authority a document called the "access arrangement information". This submission, together with its appendices, constitutes Western Power's access arrangement information.

In developing the access arrangement and the access arrangement information, Western Power has sought to meet the requirements of all the relevant provisions of the Code. In guiding the development of its access arrangement Western Power has had particular regard to the Code objectives, as defined in section 2.1 of the Code, as follows:

> "The objective of this Code is to promote the economically efficient:
>
> (a) investment in; and
>
> (b) operation of and use of,
>
> *networks* and *services* of *networks* in Western Australia in order to promote competition in markets upstream and downstream of the *network*s."

The access arrangement period will be for 3 years, commencing on 1 July 2006.

Western Power's network business and recent performance

Western Power Corporation is currently an integrated energy company which owns and operates generation, transmission and distribution infrastructure supplying electricity to over 860,000 customers in Western Australia. The *Electricity Corporations Bill 2005*, which received its second reading on 5 May 2005, would give effect to the restructuring of Western Power Corporation by creating four new Government-owned corporations in the form of:

- a Generation Corporation, responsible for power generation within the South West Interconnected System (SWIS);
- a Networks Corporation, responsible for the transport of electricity within the SWIS;
- a Retail Corporation responsible for the sale of electricity within the SWIS; and

- a Regional Power Corporation responsible for the generation, transport and sale of electricity in all areas of the State outside of the SWIS.

The Code only relates to Western Power's network in the South West Interconnected System (or SWIS). This network consists of transmission and distribution assets, and it extends from Kalbarri to Albany and across to the Eastern Goldfields. It contains more than 140 major substations, 6,000 km of transmission lines (operating at voltages of 66 kV and greater) and over 64,000 km of high voltage distribution lines (operating at 33 kV and lower).

Table E1 below provides a summary of the key network assets which comprise the SWIS.

Table E1 Network assets of the South West Interconnected System as at June 2004

	Overhead Assets	Underground Assets
South West Interconnected System Transmission Lines		
330 kV (km)	891	
220 kV (km)	655	
132 kV (km)	4435	9
66 kV (km)	1055	12
33 kV (km)	17	
South West Interconnected System Distribution Network		
High voltage mains (km)	58691	3655
Low voltage mains (km)	9896	8120
Total transformer capacity (MVA)	5236	
Streetlights	190007	

Western Power operates a large and expansive electricity network servicing the majority of the Western Australian population. A geographical map of the SWIS has been included in section 2 of this Part A of this submission. The SWIS network contains:

- over 140 transmission substations;
- 6,750 kilometres of transmission lines and cables; and
- 83,000 kilometres of overhead and underground distribution networks.

It covers vast areas in the South West and North West of Western Australia which are heavily dominated by remote mining loads. The physical environment in which Western Power operates presents additional challenges, for example:

- the identification and rectification of faults may involve significant travel time; and

- coastal exposure, an arid interior and prevailing on-shore winds contribute to salt and dust pollution.

Unlike networks in the Eastern states, Western Power is virtually unable to call on additional resources from its neighbours, or to share a large pool of independent contractors. The relative isolation of the SWIS from other networks also contributes to a relatively challenging operating environment.

Together, all of these factors suggest that Western Power's recent cost performance should compare unfavourably with other network businesses across Australia. Contrary to this expectation, however, recent studies undertaken by Meyrick & Associates and Benchmark Economics have all identified Western Power's network business as a better-than-average cost performer.

In fact, Western Power's view is that the current level of expenditure is not sustainable, and will need to increase in the forthcoming access arrangement period. Further details of the reasons for the increase are provided below.

Future service levels and compliance obligations

In broad terms, the key underlying cost drivers of Western Power's network business are:

- the **standards** or **quality** of services and other outputs which Western Power plans to deliver over the forthcoming access arrangement period; and

- the **quantity** of the services to be delivered over the period.

Accordingly, the expenditure forecasts must reflect:

- the planned transmission and distribution service standards, including compliance with mandatory health, safety and environmental standards; technical standards; and service performance targets; and

- the forecast demand on the transmission and distribution networks, and the forecast of new generation developments.

Western Power has examined each of these cost drivers in detail in developing its capital and operating expenditure forecasts for the transmission and distribution elements that comprise the network business.

In terms of importance, expenditure required to satisfy the company's compliance obligations is mandatory and cannot be avoided or deferred. It is noted that the sources of these obligations include:

- the Electricity (Supply Standards and System Safety) Regulations 2001, which contain various quality-related benchmarks;

- The Technical Rules, which set out the standards, procedures and planning criteria governing the construction and operation of an electricity network, and deal with all the matters listed in Appendix 6 of the Access Code;

- the Electricity Transmission Access Technical Code and the Distribution Technical Code and Planning Criteria, which establish standards for the connection of new users;

- Environmental Protection (Noise) Regulations; and

- Electricity Regulations 1947.

The cost of meeting these obligations is substantial and is also forecast to increase over the forthcoming access arrangement period and beyond.

In addition, in accordance with the Code, Western Power proposes to adopt service standard benchmarks for the transmission and distribution networks. As noted in further detail below, Western Power will be financially accountable for delivering service standards in accordance with these benchmarks. Meeting these service standard benchmarks will also affect Western Power's future capital and operating expenditure but to a lesser extent than the compliance obligations noted above.

In relation to service standard benchmarks for the distribution network, Western Power has had regard to current level of SAIDI performance; the recent trend of deterioration in performance; and the competing demands on resources which are expected to be present over the forthcoming access arrangement period. Taking all of these matters into consideration, Western Power has adopted a target of achieving a 25% improvement in SAIDI (compared to actual performance for the year ended in June 2004) over the forthcoming access arrangement period.

The company also proposes a service standard adjustment mechanism, under which the company will face financial incentives to deliver services in accordance with the service standard benchmarks. In particular, the company will face financial penalties if it fails to achieve the stated SAIDI improvement targets. Similar arrangements will also apply in relation to the performance of the transmission network.

Western Power's financial exposure under the service standard adjustment mechanism will be limited to plus and minus 1% of total revenue. This level of exposure provides a meaningful and material incentive to Western Power to deliver service standards that accord with, or exceed its targets, whilst ensuring that the down-side risk is limited, particularly in light of the novelty of the proposed arrangements. It is also noteworthy that the proposed level of financial exposure is consistent with that faced by transmission companies under similar schemes developed and administered by the ACCC in the National Electricity Market.

The service standard benchmarks for the distribution network for each year of the first access arrangement period are shown in the table below.

Table E2 Distribution network service standard benchmarks

	SAIDI *service standard benchmarks* (expressed as system minutes per annum)		
	Year ending June 2007	Year ending June 2008	Year ending June 2009
SWIS total	277	259	224
Urban sub-network	242	226	195
Rural sub-network	509	476	410

The service standard benchmarks for the transmission network for each year of the first access arrangement period are shown in the following table:

Table E3 Service standard benchmarks for transmission

	First access arrangement period		
	Year ending June 2007	Year ending June 2008	Year ending June 2009
Circuit Availability (% of total time)	98.67	98.67	98.67
System Minutes Interrupted (meshed network)	8.3	8.3	8.3

Network operating and capital expenditure forecasts

The operating and capital expenditure requirements of the network business should achieve the following outcomes:

- network asset condition and service performance should comply with all relevant legislation and regulations;
- service performance should comply with the established benchmarks and therefore satisfy customers' expectations in terms of reliability and quality of supply;
- generation connections should be facilitated to ensure that security of supply is maintained;
- assets must be renewed to ensure that service performance is not compromised in the medium term;
- asset management strategies should be aligned with industry best practice;

- the life-cycle costs of providing transmission services should be minimised by appropriately balancing operating and capital expenditure; and

- sustainable efficiency gains, in terms of improved performance, increased output and lower cost should be delivered over time.

In addition, it is essential that expenditure plans are feasible given the availability of internal and external resources, and the need to ensure that expenditure is executed efficiently.

For the transmission and distribution networks, there are a number of high-level cost drivers that will cause expenditure to increase above present levels in the forthcoming access arrangement period. There are 14 principal cost drivers, which are briefly described below:

Table E4 Principal cost drivers for the transmission and distribution networks

1. The impacts of previous budget constraints	In the recent past, Western Power's capital expenditure has been budget-constrained. Given the substantial growth in new customers over the same period, the consequence of the budget constraints has been to defer expenditure in relation to replacement and maintenance of the existing assets. This resulting backlog in works now needs to be addressed
2. Facilitation of market reform	It is important that Western Power fully supports the implementation of market reforms, including the facilitation of competition and the disaggregation of the transmission and distribution networks. The market reforms will have the most significant impact upon Western Power in the Information Technology area, although structural changes will impact all areas of the business.
3. Asset replacement	The advancing age of Western Power's network means within the next 10 to 15 years, there will be a need to replace much greater volumes of assets than has been the case in the last ten years.
4. Facilitating forecast increases in generation capacity	In recent years the extent to which generation capacity exceeds consumer demand has fallen to a historically low level. Western Power is therefore expecting an increase in generation capacity over the access arrangement period, which in turn will affect network expenditure.
5. The application of new design standards	In the 1990s the company allowed certain substations to be loaded to 90% of the normal cyclic rating (NCR), providing that a rapid response spare transformer (RRST) was available in the event of a transformer failure. Although the adoption of this policy has been successful in managing the capital expenditure restrictions noted above, it has resulted in an increasing utilisation of the substations. As the average loading level of substations across the system increases, it is becoming increasingly difficult to operate the network under contingency conditions, and the risk of loss of supply is increasing.
6. Optimisation of maintenance expenditure	To assist the company to optimise its future maintenance expenditure, Western Power intends to develop a more comprehensive maintenance strategy. Western Power believes that an increased focus on strategic asset management will enable the business to identify efficiency and network performance improvement opportunities that will ultimately lead to improvements in services for customers.

7.	**Insurance**	Western Power's insurance costs have increased over the past 2 years, and are projected to escalate further over the forthcoming access arrangement period. Increases occurring in 2004 and 2005 reflect the difficult climate for utility insurances following 9/11 and the general tightening of policy availability and conditions. The continued increases reflect the expected industry trends for insurance premiums following careful analysis of the market.
8.	**Compliance with more onerous safety, health, and environment regulations;**	Western Power has identified the following specific transmission capital expenditure projects that are required in order to ensure the company's compliance with existing regulations: o substation fencing and security upgrades; o transmission line river crossing; o replacement of 216 22 kV bus disconnectors; o transmission substation safety upgrades; and o transformer neutral earthing resistors. In relation to the distribution network, the following compliance issues have been identified as requiring additional capital expenditure: o Overhead service wires with twisties; o Conductive metal streetlight poles; o Distribution conductive power poles step and touch potential mitigation; o Streetlight switch wires; o URD cable pits; o Henley cable boxes; o Pole top switch (PTS) earthing mats; o Live-frame shrouding; o Wrapped copper LV neutral service connections; o Inadequate reinforcing of transformer poles; o Padmount transformer noise; and o Bushfire mitigation. The completion of these non-discretionary projects will require additional capital expenditure compared to recent historic levels.
9.	**Reliability**	Additional expenditure is required to meet Western Power's service standard benchmarks in relation to SAIDI. Network maintenance programs have been developed to facilitate the achievement of the significant reductions in interruptions required to meet the proposed reliability targets.
10.	**Whole of life efficiencies**	Improved preventative maintenance programs have been introduced to achieve an optimal balance between maintenance and capital expenditure. These programs are expected to allow Western Power to extend the operational lives of some assets whilst minimising service interruptions and corrective maintenance costs, thus leading to a reduction in overall lifecycle costs.
11.	**Increasing asset Base**	Additional operating expenditure will arise as a result of the growth in network assets under the company's capital expenditure program.
12.	**Increasing Resource Costs**	Increases in average unit costs for maintenance are expected, due to competition for resources and contractors within WA and nationally.
13.	**Metering services**	Metering inspections will increase in line with the projected increase in customer connections. In addition, installation and data management costs are expected to increase, as increasing numbers of customers request interval meters.
14.	**Call centre costs**	Historically, there has been no recognition of the cost of fault call handling in network tariffs. In the future, however, the network business will enter into a service level agreement with Western Power Retail for the provision of these services and initial negotiations on formulating the terms and conditions for this agreement have commenced.

The impact of these cost drivers on Western Power's preferred level of capital and operating expenditure has been assessed with the assistance of the respected industry consultant PB Associates. Overall, the cost drivers imply that operating and capital expenditure will need to increase substantially compared to historic levels.

In developing its expenditure proposals, however, Western Power has also had regard to the resource constraints, both internally and within the broader contractor market. The consideration of resource constraints has led Western Power to adopt a number of strategies to ensure that expenditure can be increased above existing levels of expenditure, whilst maintaining value for money in terms of efficient project execution. Notwithstanding these strategies, Western Power believes that the external contractor market has limited capacity to deliver the increased work program, and therefore Western Power's expenditure proposals have been scaled back accordingly.

A further consideration in establishing expenditure proposals is the financing constraints that must also apply, and a consideration of the impact of higher expenditure on the network prices that will be paid by customers. Following discussions with Government in its role as shareholder, Western Power has further reduced its proposed level of expenditure for this forthcoming access arrangement period in the light of these financing and pricing considerations. In aggregate the impact of these financing, resourcing and pricing constraints produces expenditure proposals that are significantly below those justified by business needs and validated by PB Associates

A summary of the proposed level of expenditure is provided in the figures E1 to E4 below:

Figure E1 Western Power's unconstrained and constrained transmission capital expenditure requirements (nominal dollars)

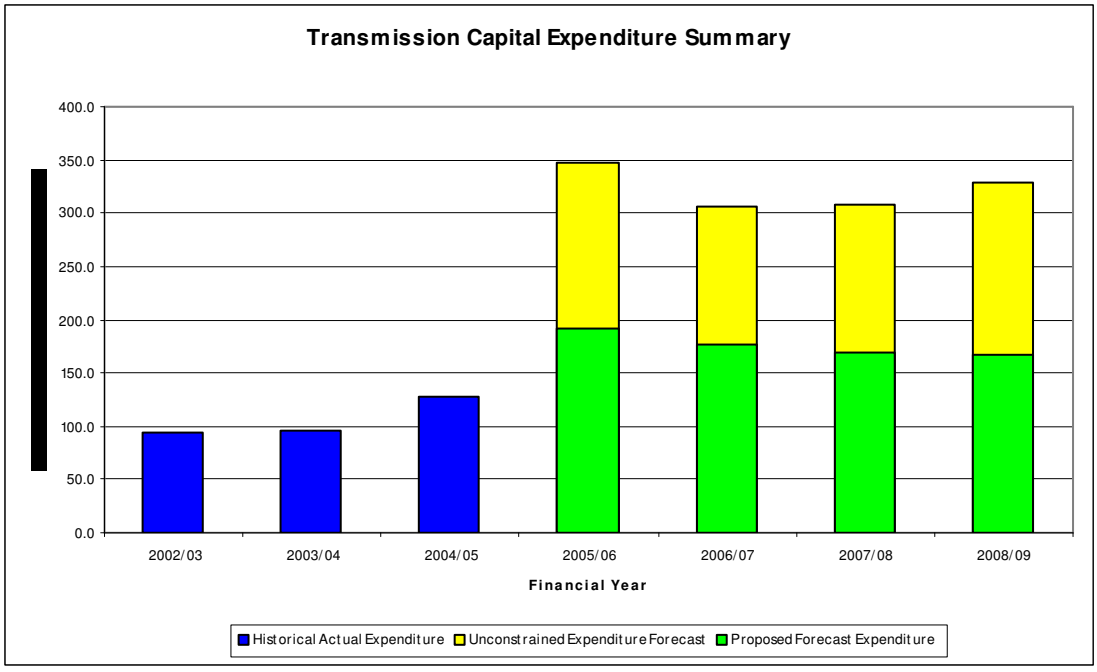


Figure E2 Transmission total operating and maintenance expenditure ($ million in nominal terms)

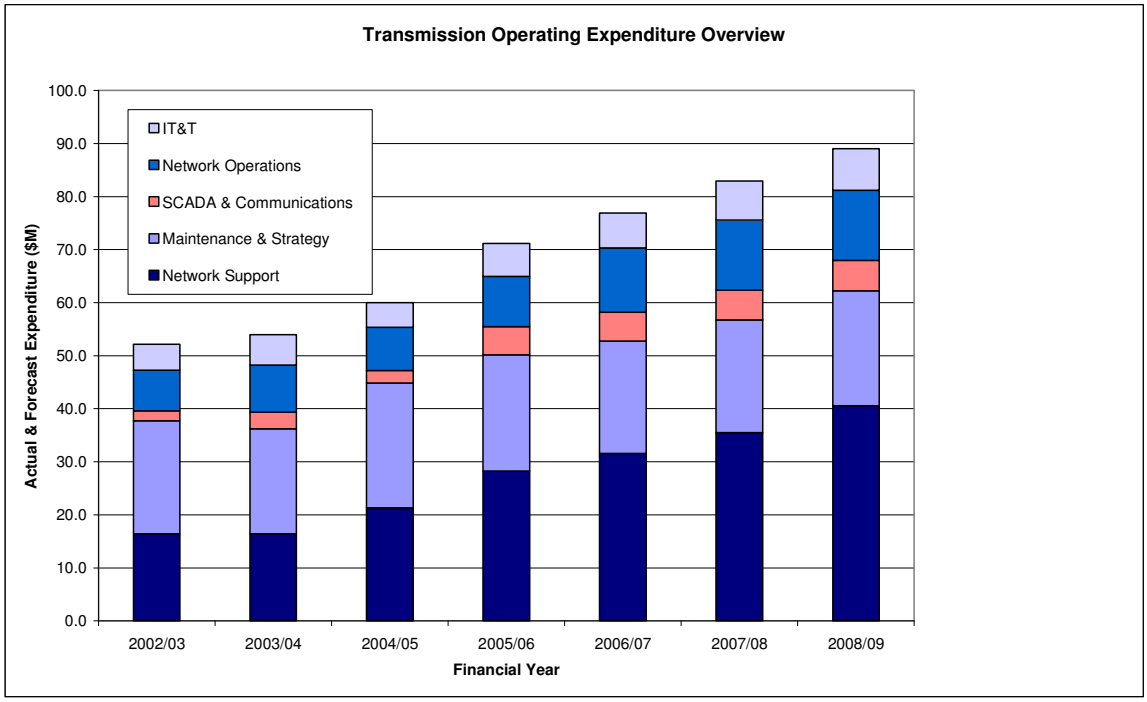


Figure E3 Western Power's unconstrained and constrained distribution capital expenditure requirements in nominal dollars

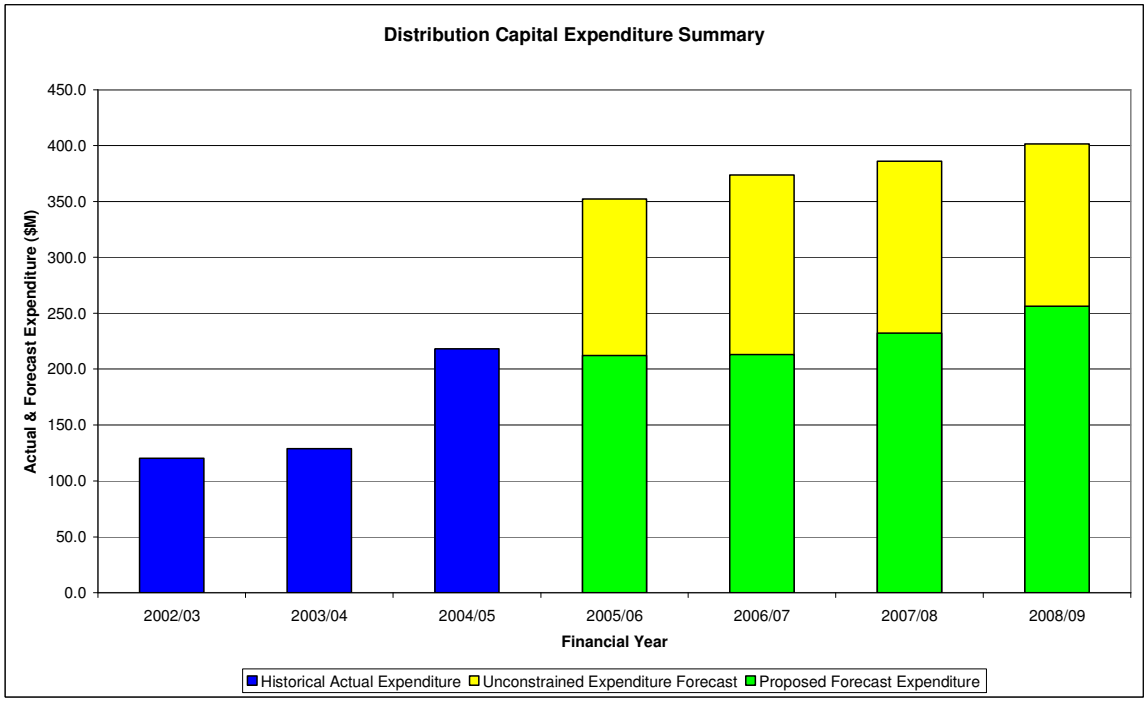
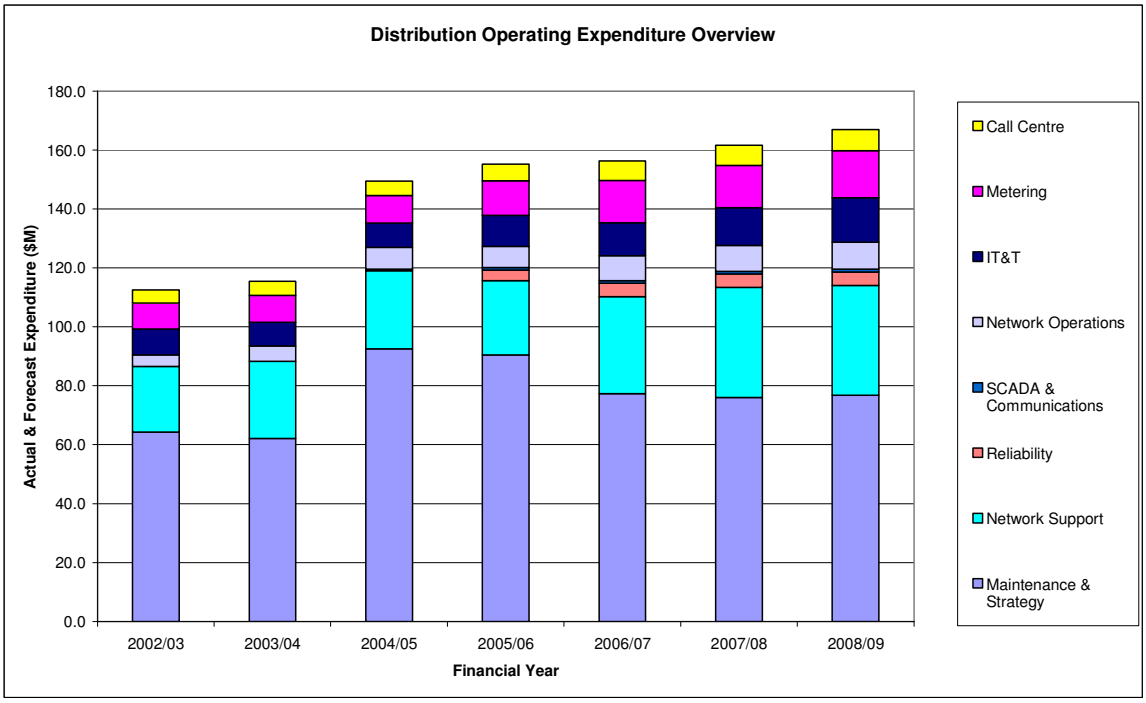


Figure E4 Distribution total operating and maintenance expenditure ($ million in nominal terms)



Overview of price control arrangements

Under the Code, Western Power's total annual revenue requirement is calculated as the sum of a series of cost "building blocks", as described briefly below.

Table E5 Summary of the building block components of target revenue

Target revenue component	Brief description
Operations and maintenance costs	This is Western Power's annual cost of operating the network, and maintaining the assets used in the delivery of services covered under the Code.
Return of capital	This is the annual depreciation charge on the assets used in the delivery of covered services.
Return on capital	This is the product of the required rate of return (the weighted average cost of capital, or WACC) and the capital base. (The capital base for a covered network means the value of the network assets that are used to provide covered services on the covered network determined under sections 6.44 to 6.63 of the Code.) The capital base value over the access arrangement period is, in turn, a function of the depreciated value of assets at the start of the period, the level of annual depreciation recovered during the period, and the level of efficient new capital expenditure (new facilities investment) that is assumed to be required over the course of the access arrangement period.
Taxation	The pre-tax approach to WACC provides an allowance for company tax in the WACC.

The total annual revenue requirement (termed "target revenue") under the Code, together with forecasts of energy volumes for each year of the access arrangement period is used to calculate the price control which will apply to Western Power.

Western Power proposes the continuation of the present "average revenue yield" price control arrangements in the forthcoming access arrangement period. Under this price control, Western Power's allowed revenue in each year of the access arrangement period is determined as the product of the allowed average revenue per unit of electricity transported over the network (a value that is set at the start of the period and then escalated by CPI minus X) and the actual volume of electricity transported.

Separate price controls will apply to the transmission and distribution networks.

The return on assets and other financing issues

As noted above, the calculation of Western Power's target revenue in the forthcoming access arrangement period requires an assessment of the value of the assets used in the delivery of regulated services (the "capital base").

Western Power proposes that the capital base will be the optimized deprival value (ODV) of assets as at 30 June 2004 (determined in accordance with the independent valuation commissioned by the WA Government's Electricity Reform Implementation Unit (ERIU)) adjusted for inflation, depreciation and capital expenditure which occurred or is forecast to occur from 30 June 2004 to 1 July 2006. The capital base value to which the required rate of return (the weighted average cost of capital, or "WACC") and depreciation apply is the total written down asset value less the accumulated written down value of the capital contributions.

Based on the ODV value established by the 2004 ERIU valuation, the transmission and distribution capital base as at 30 June for each year over the five year period from 30 June 2004 has been calculated as shown in the tables below.

Table E6 Derivation of transmission capital base value ($m in nominal terms)

	Year ending 30 June					
	2004	**2005**	**2006**	**2007**	**2008**	**2009**
Year of first access arrangement period				**1**	**2**	**3**
Opening capital base value	-	1,132	1,213	1,370	1,596	1,849
Escalation	-	25	30	34	39	46
Capital Expenditure	-	99	175	244	272	291
Depreciation	-	43	47	52	59	65
Disposals	-	0	0	0	0	0
Closing capital base value	1,132	1,213	1,370	1,596	1,849	2,120

Table E7: Derivation of distribution capital base value (nominal $m)

	Year ending 30 June					
	2004	**2005**	**2006**	**2007**	**2008**	**2009**
Year of first access arrangement period				**1**	**2**	**3**
Opening capital base value	-	1,315	1,410	1,482	1,655	1,846
Escalation	-	30	34	36	40	45
Capital Expenditure	-	152	127	233	254	280
Depreciation	-	83	86	92	99	107
Disposals	-	5	3	4	4	4
Closing capital base value	1,315	1,410	1,482	1,655	1,846	2,060

Western Power's approach to determining the depreciation charge (or "return of capital" allowance) to be applied in the calculation of target revenue is to adopt a robust assessment of the appropriate weighted average depreciation charge for the portfolio of assets that make up the capital base.

The WACC is the final critical determinant of the level of Western Power's capital-related costs. The product of WACC and the capital base determines the "return on capital" component of the revenue requirement. This component comprises a substantial proportion of the company's total costs, and hence its target revenue.

There is a significant degree of imprecision and subjectivity involved in the estimation of the WACC, and there is certainly no single objectively "correct" estimate of the WACC. It is universally recognised however, that very large costs to society as a whole would arise over the long term if regulators set the WACC at a level that is insufficient to encourage adequate on-going investment in infrastructure over the long term.

Western Power appointed KPMG and the Strategic Finance Group (SFG) to provide specialist assistance in estimating the WACC. The reports provided by KPMG and SFG form part of this access arrangement information, and are attached as Appendices 4 and 5, respectively. This expert advice provides a compelling case for an estimated real pre-tax WACC in the range of 7.8 to 8.0%.

Notwithstanding the case for applying a real pre-tax WACC in the range of 7.8 to 8.0%, Western Power recognises the need for pragmatism to be applied in selecting a point estimate of the WACC, having regard, in particular to:

- the need to moderate anticipated price increases at the commencement of the new access arrangement (in comparison to those that would be associated with a WACC of 7.8% to 8.0%);

- policymakers' expectations regarding the outcomes of electricity industry reform in Western Australia;

- the need to ensure that Western Power remains a financially viable business; and

- the views expressed previously by the Authority on the issue of WACC.

Having regard to all of the foregoing considerations, Western Power proposes to apply a real pre-tax WACC of 7.3% for the purpose of determining its target revenue for the first access arrangement period.

Furthermore, it is reasonable to argue that the uncertainty associated with the impending re-structuring of Western Power Corporation, coupled with a price control arrangement that treats capital contributions as revenue (foreshadowed in section 6 of this Part B) will lead to an increase in the volatility of costs and revenues, and therefore return on assets. This may, in turn lead to an increase in systematic risk borne by equity providers and additional credit risk to the providers of debt.

It is further noted that treating capital contributions as regulated revenue has the effect of markedly decreasing the company's cash flow in the initial years of the new regulatory regime, and increasing cash flows in later years. The alternative cash flow streams would be the same in present value terms. Given the newness of the regulatory regime, however, delaying the return of capital to investors may expose Western Power to increased asset stranding risk. This observation implies that the cost of capital may be higher under the proposed approach to capital contributions.

Given the issues of restructuring and capital contributions, Western Power strongly believes that its proposed WACC of 7.3% is towards the lower end of the plausible range of WACC estimates.

In putting forward this proposal, Western Power wishes to emphasise that:

- the company has submitted a WACC proposal, in the first instance, which is consistent with reasonable expectations, and which is therefore not an ambit claim; and

- the company shares the Authority's desire to ensure that the approval process is not unduly delayed by time consuming debate over the proper range for the WACC.

Tariff Equalization Contribution

The Code is expected to be amended soon after the passage of the Electricity Corporations Bill 2005 (ECB), which provides the statutory basis for the Tariff Equalisation Fund and the recovery of a Tariff Equalisation Contribution (TEC) by Western Power from networks tariffs. This Code change is expected to occur prior to the finalisation of the access arrangement review and will require both the Authority and Western Power to recognise the need to recover the TEC as determined by the Treasurer in accordance with the ECB. This will be a non-discretionary process for both the Authority and Western Power. Western Power's access arrangement therefore includes a provisional amount of $60M per annum for the TEC, and these additional costs are reflected in the proposed reference tariffs.

Revenue and average price outcomes

Western Power's transmission and distribution revenue and average price path outcomes are described in the tables and figures below.

Table E8 below shows Western Power's forecast for each building block component of the target revenue, together with the target revenue for the transmission business (being the sum of the building block components) for each year of the forthcoming access arrangement period. The table also shows the tariff revenue for the transmission business.

Table E8: Components of total annual revenue requirement for transmission in nominal dollars ($M)

Revenue Component	Year ending 30 June		
	2007	2008	2009
Operating Costs ($M)	76.9	82.9	89.0
Regulatory Depreciation ($M)	56.2	61.4	67.1
Return on Capital ($M)	113.1	125.6	137.4
Revenue Smoothing Adjustment ($M)	8.5	-0.2	-10.1
Target Revenue (Smoothed in $M)	254.6	269.8	283.4
Deduct Capital Contribution Revenue ($M)	20.8	22.5	22.5
Tariff Revenue for Transmission Business ($M)	233.8	247.3	260.9

Figures E5 and E6 show the trend in transmission tariff revenues and average transmission tariff prices in nominal dollars for the year ending 30 June 2002 to the end of the first access arrangement period.

Figure E5: Trend in Transmission Tariff Revenue in Nominal Dollars

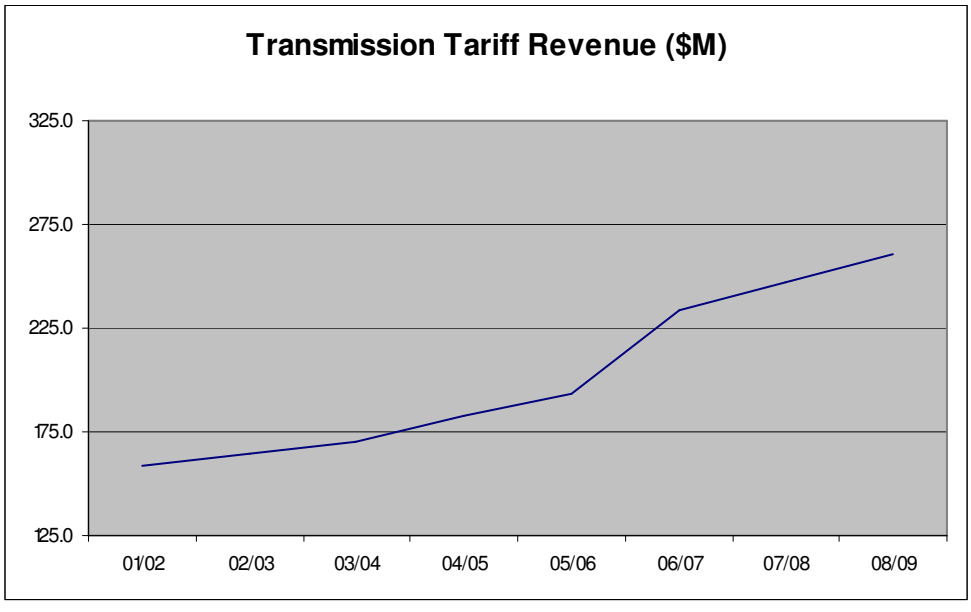


Figure E6: Trend in Transmission Average Price in nominal terms

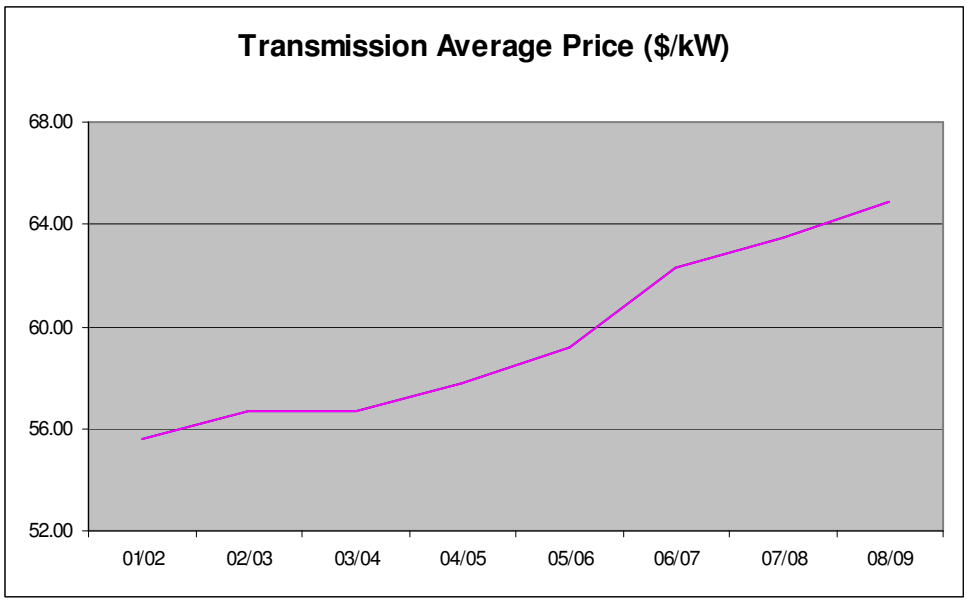


Table E9 below shows Western Power's forecast for each building block component of the target revenue, together with the target revenue for the distribution business (being the sum of the building block components) for each year of the forthcoming access arrangement period. The table also shows the tariff revenue for the distribution business.

Table E9: Components of total annual revenue requirement for Distribution network in nominal dollars ($M)

Revenue Component	Year ending 30 June		
	2007	2008	2009
Operating Costs	156	162	167
Regulatory Depreciation	106	114	122
Return on Capital	126	141	157
TEC[1]	60	60	60
Revenue Smoothing Adjustment[2]	3	1	-8
Target revenue for distribution business	**451**	**477**	**498**
Deduct Capital Contribution Revenue	91	92	95
Deduct Misc Services Revenue	6	6	6
Tariff Revenue	**354**	**378**	**396**

1 Tariff Equalisation Contribution

2 The smoothing adjustment provides for a smooth revenue path over the regulatory period

Figures E7 and E8 show the trend in distribution tariff revenues and average distribution tariff prices in nominal dollars for the year ending 30 June 2002 to the end of the first access arrangement period.

Figure E7: Trend in Distribution Tariff Revenue in Nominal Dollars

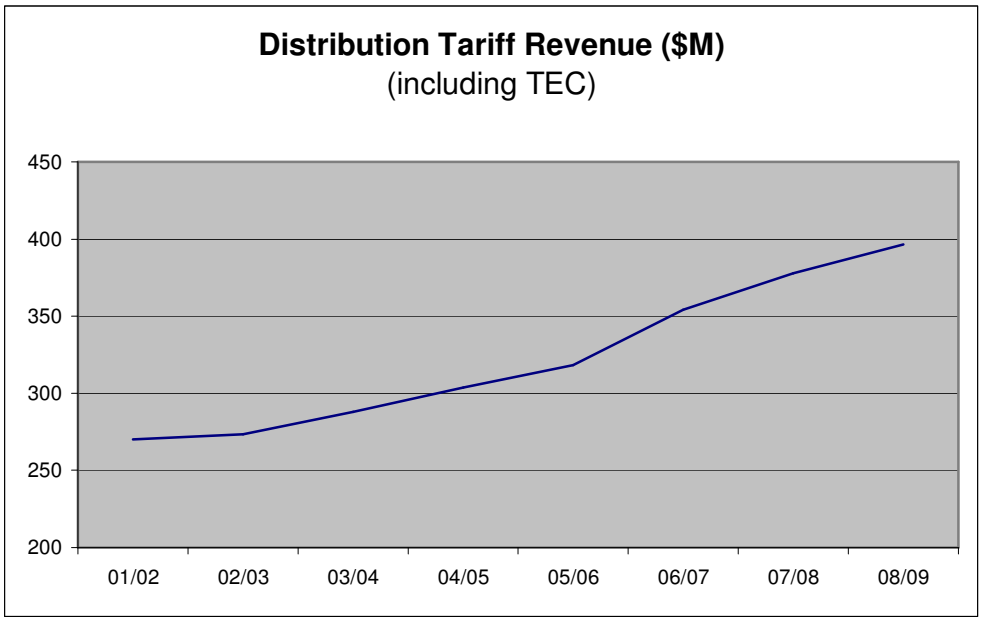
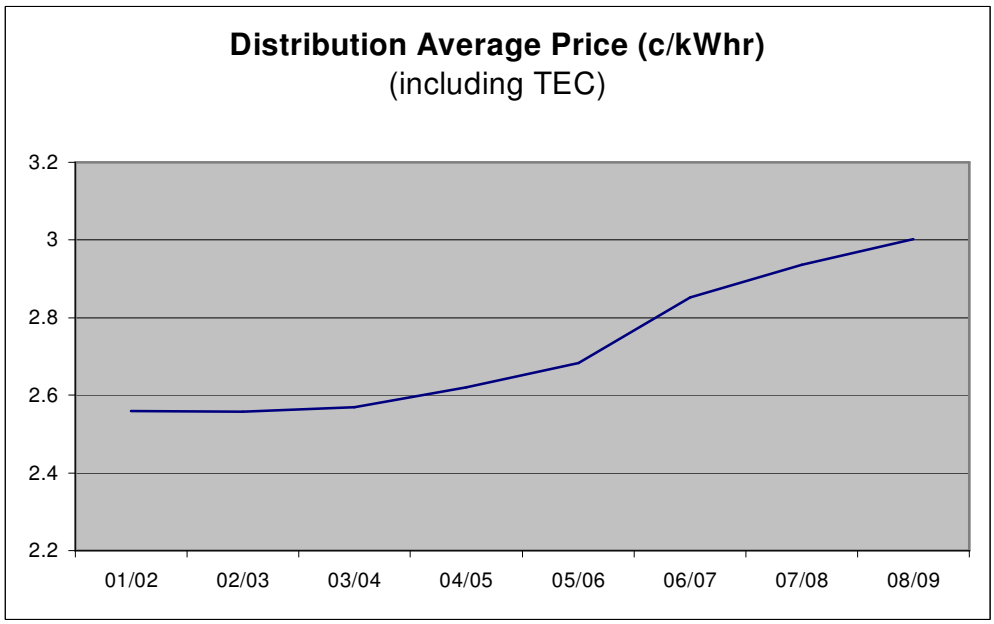


Figure E8: Trend in Distribution Average Price in nominal terms



Tariffs and service offerings

Under the Code, Western Power is required to offer "reference services"[3], in accordance with the following criteria:

- Reference services are those services that are likely to be sought by a significant number of users and applicants or a substantial proportion of the market for services in the covered network.

- Reference services should be specified in a manner that enables a user to acquire by way of one or more reference services only those elements of a covered service that the user wishes to acquire.

- Reference services should be defined in a way that enables users to acquire entry (or exit) services without having to acquire corresponding exit (or entry) services.

The existing distribution and transmission tariffs (and the corresponding services) have been developed with these broad concepts in mind. Specifically, the existing Western Power tariffs reflect the services that a significant proportion of the company's customers want, without "bundling" services together in a manner that requires customers to acquire services that they do not want. On this basis, Western Power has adopted the existing tariffs as the basis for defining reference services.

These tariffs comprise:

- 10 "bundled" tariffs for customers with loads connected to the distribution network are inclusive of both transmission and distribution charges which are separately calculated for financial and regulatory purposes, but are published as combined single tariffs for convenience.

- One distribution service for generation customers directly connected to the distribution network

- Two transmission services for customers directly connected to the transmission network.

Regulatory and policy framework

The revenue and price path described above are subject to a regulatory framework that is defined by Western Power's access arrangement in accordance with the Code. In particular, there are a number of adjustment mechanisms that may be applied to Western Power's revenue, to take account of the impact of particular circumstances that may arise during the forthcoming access arrangement period.

The purpose of these various adjustment mechanisms is to properly balance the allocation of risk between Western Power and its customers in the event that expenditure turns out to be higher or lower than forecast for reasons beyond Western Power's control.

[3] A reference service is a service regulated under the Code for which there is a standard access contract (which forms part of the access arrangement), a reference tariff, and service standard benchmarks which set out the standard of service that users can expect to receive in exchange for payment of the reference tariff.

The reference tariffs are set at a level that satisfies Western Power's proposed price control. The structure of reference tariffs is determined in accordance with Western Power's pricing method, which is also consistent with the Code requirements.

Western Power's access arrangement includes a number of documents that describe the terms and conditions on which Western Power offers to provide covered services to applicants and users. In broad terms, the following list identifies the principal documents and their respective roles in the access arrangement:

- Applications and Queuing Policy processes applications for an access contract in an orderly and fair manner, especially where network capacity is scarce;

- Transfer and Relocation Policy specifies a user's rights to transfer its access rights to another person and relocate capacity from one connection point in its access contract to another connection point in its access contract;

- Capital Contributions Policy describes the circumstances in which a capital contribution will be payable by the applicant and the method for calculating the capital contribution;

- Standard Access Contract describes the standard terms and conditions on which Western Power will offer a user access to its network;

- Policy on Prudent Discounting describes the circumstances in which Western Power will offer discounted charges to particular network users; and

- Policy on Discounts for Distributed Generation describes Western Power's discounts to distributed generators where these generators reduce network costs.

Western Power's standard access contract and policies have had regard to the model contract and policies detailed in the Code. However, in a number of respects Western Power has proposed changes to the model contract and policies in order to facilitate the achievement of the Code objective.

Submission and approval process

Western Power has agreed with the Authority to submit its proposed access arrangement, access arrangement information and technical rules to the Authority by 24 August 2005.

The Authority is required by the Code to determine whether a proposed access arrangement meets the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable). If these Code requirements are satisfied the Authority must approve the proposed access arrangement. Section 4.28(b) of the Code further clarifies the approach that the Authority must adopt, as follows:

> "to avoid doubt, if the Authority considers that the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable) are satisfied, it must not refuse to approve the proposed *access arrangement* on the ground that another form of *access arrangement* might better or more effectively satisfy the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable)."

PART A: INTRODUCTION AND BACKGROUND

1 Introduction to Part A

This submission is Western Power's access arrangement information, prepared in accordance with the requirements of the Network Access Code 2004 ("the Code"). This submission explains and substantiates Western Power's proposed access arrangement for its transmission and distribution networks that are covered by the Code.

Part A of the submission provides important background information and context to this submission. This Part A comprises four further sections, as follows:

- section 2 explains briefly the development of the Code;
- section 3 provides an overview of Western Power and its network business;
- section 4 presents an overview of Western Power's network planning and investment process; and
- section 5 describes the recent performance of Western Power's networks business and its planned service outputs for the forthcoming access arrangement period.

The remainder of this submission is then presented in three further parts as follows:

- Parts B and C provide detailed information to substantiate the expenditure plans and revenue requirements of the transmission and distribution networks respectively; and
- Part D sets out information and explanatory material relating to the regulatory framework governing access to Western Power's transmission and distribution networks.

2 Development of the Access Code and Western Power's access arrangement

2.1 Development and purpose of the Access Code

The electricity industry in Western Australia has been the subject of significant reform over the last 10 years. The objective of industry reform is clear – it is to provide Western Australians with safe and reliable electricity at competitive prices. The State Government's plan for reform involves establishing a competitive electricity industry, protecting consumers and keeping the State's electricity assets in government ownership. Western Power is committed to facilitating the achievement of these objectives.

In January 1995 the industry reform process commenced with the separation of the State Energy Corporation into two new corporations, Western Power Corporation and AlintaGas. Following this major restructuring, working groups were established under the auspices of the Office of Energy to develop principles and processes for the provision of third party access to Western Power's networks. These working groups successfully developed and published regulations, technical codes and

pricing methods. Transmission network access services became available on 1 January 1997, and distribution access services became available on a progressive basis from 1 July 1997.

Despite the significant progress achieved since 1995, the Government has decided that further reform is required in order to deliver greater benefits to customers. On 25 November 2002, State Cabinet endorsed the next stage of an electricity reform program including the formation of Western Power into separate generation, networks, retail and regional businesses. The Electricity Reform Implementation Unit of the Office of Energy has been established to develop an access code and market rules, and to oversee the disaggregation of Western Power.

In relation to network access, the process of applying for and acquiring network access services had been criticised by market participants for being too slow and complex. In recognition of this, the Electricity Reform Implementation Unit responded by saying that the development of a new access code was an important step in the Government's reform programme for the electricity networks within the State[4].

The Code[5] was gazetted on 30 November 2004 and commenced on the same day. The introduction to the Code explains that:

> "The Code aims to be, where appropriate given conditions prevailing in Western Australia:
>
> - consistent with the National Electricity Code and National Gas Code; and
> - capable of certification as an effective *access* regime under Part IIIA of the *Trade Practices Act 1974*.
>
> This Code establishes a framework for third party *access* to electricity transmission and distribution *networks* with the objective of promoting the economically efficient investment in, and operation and use of, *networks* and *services* of *networks* in Western Australia in order to promote competition in markets upstream and downstream of the *network*s."

To address specifically the criticisms levelled at the previous access regime, the Code requires an approved standard access contract and an approved applications and queuing policy. The intended objective is to provide an improved "balance" between the rights and obligations of the parties seeking access, and those of Western Power as the service provider.

The Code also provides a framework for the independent regulation of certain electricity networks in Western Australia. The Economic Regulation Authority ("the Authority") is now responsible for regulating third party access to electricity networks in Western Australia that are covered by the Code.

At the commencement of the Code, the only networks covered by the Code are the portions of the South West interconnected system (SWIS) that are owned by Western Power. Formally, the SWIS is defined by the Electricity Industry Act 2004 as:

> "the interconnected transmission and distribution systems, generating works and associated works:

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4 ERIU, Steve Edwell's Open letter to interested parties – Public Consultation – WA Electricity Networks Access Code 2004, 5 April 2004

5 *Electricity Networks Access Code 2004*, made under Part 8 of the Electricity Industry Act 2004.

(a) located in the South West of the State and extending generally between Kalbarri, Albany and Kalgoorlie; and

(b) into which electricity is supplied by:

i. one or more of the electricity generation plants at Kwinana, Muja, Collie and Pinjar; or

ii. any prescribed electricity generation plant."

Western Power has agreed with the Authority to submit its proposed access arrangement, access arrangement information and technical rules to the Authority by 24 August 2005.

The Authority is required by the Code to determine whether a proposed access arrangement meets the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable). If these Code requirements are satisfied the Authority must approve the proposed access arrangement. Section 4.28(b) of the Code further clarifies the approach that the Authority must adopt:

> "to avoid doubt, if the Authority considers that the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable) are satisfied, it must not refuse to approve the proposed *access arrangement* on the ground that another form of *access arrangement* might better or more effectively satisfy the Code objective and the requirements set out in Chapter 5 (and Chapter 9, if applicable)."

2.2 Western Power's approach to preparing the access arrangement

The term "access arrangement information" is defined by the Code as follows:

> "In relation to an *access arrangement*, means the information submitted by the *service provider* under section 4.1 as described in sections 4.2 and 4.3, as amended from time to time, and is not part of the *access arrangement*."

Section 4.2 and 4.3 describe the purpose and content of the access arrangement information in the following terms:

"4.2 *Access arrangement information* must enable the *Authority*, *users* and *applicants* to:

(a) understand how the *service provider* derived the elements of the *proposed access arrangement*; and

(b) form an opinion as to whether the *proposed access arrangement* complies with the Code.

4.3 *Access arrangement information* must include:

(a) information detailing and supporting the *price control* in the *access arrangement*; and

(b) information detailing and supporting the *pricing methods* in the *access arrangement*; and

(c) if applicable, information detailing and supporting the measurement of the components of *approved total costs* in the *access arrangement*; and

(d) information detailing and supporting the *service provider's* system capacity and volume assumptions."

In order to comply with the Code requirements, therefore, it is essential that this submission addresses the matters set out in sections 4.2 and 4.3. Western Power appreciates that the Authority, users and applicants will be particularly interested in

item 4.3(c), which essentially provides information to explain and support Western Power's future expenditure plans. This information will provide the basis for determining the company's total revenue requirement, and hence tariffs, over the forthcoming regulatory period.

In developing the access arrangement and the access arrangement information, Western Power has sought to address all the relevant provisions of the Code. In addition, Western Power has had regard to recent regulatory practice in Australia in order to guide its approach to certain matters. Of particular interest is the ERA's recent decision[6] in relation to AlintaGas' proposed access arrangements, and recent developments in the Australian Competition and Consumer Commission's approach to the regulation of transmission businesses in the National Electricity Market.

However, regulatory practice in other sectors and jurisdictions can only guide Western Power's approach to some degree. Above all other considerations, Western Power's access arrangement and the supporting access arrangement information must comply with the Code. In this context, Western Power notes also the importance of the Code objectives, as defined in section 2.1 of the Code, in guiding the development of its access arrangement:

> "The objective of this Code is to promote the economically efficient:
>
> (a) investment in; and
>
> (b) operation of and use of,
>
> *networks* and *services* of *networks* in Western Australia in order to promote competition in markets upstream and downstream of the *network*s."

Western Power also notes that in relation to certain matters the Code is prescriptive in terms of the approach that Western Power must adopt. To assist users and applicants in understanding where the Code mandates a particular approach, this submission identifies relevant Code provisions, where appropriate. There are two such matters that are worth highlighting at this stage:

- Section 5.30 of the Code requires that the first access arrangement defines a "target revisions commencement date" that is no more than 3 years after the access arrangement start date. In effect, therefore, the first access arrangement must be no more than 3 years in duration.

- Section 6.3 of the Code requires that the first access arrangement must contain a price control set by reference to Western Power's approved total costs. Essentially, this Code provision means that Western Power's revenues in the first access arrangement period must be justified on the basis of Western Power's cost of service.

3 An overview of Western Power and its network business

3.1 Introduction

In this section, Western Power provides high-level background information on the company and the operation of its network business. This provides a foundation for more detailed information regarding the performance of the network business and its future expenditure requirements, which is set out in Parts B and C of this submission.

[6] ERA, Final Decision on the Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, 12 July 2005.

The remainder of this section is structured as follows:

- section 3.2 provides a brief overview of Western Power Corporation;
- section 3.3 describes Western Power Corporation's organisational structure;
- section 3.4 explains the company's Statement of Strategic Intent, and its relationship to this submission;
- section 3.5 describes Western Power's network that is covered by the Code;
- section 3.6 presents a summary of the network business' recent initiatives and achievements; and
- section 3.7 provides a high-level summary of the future challenges facing the network business in the forthcoming access arrangement period.

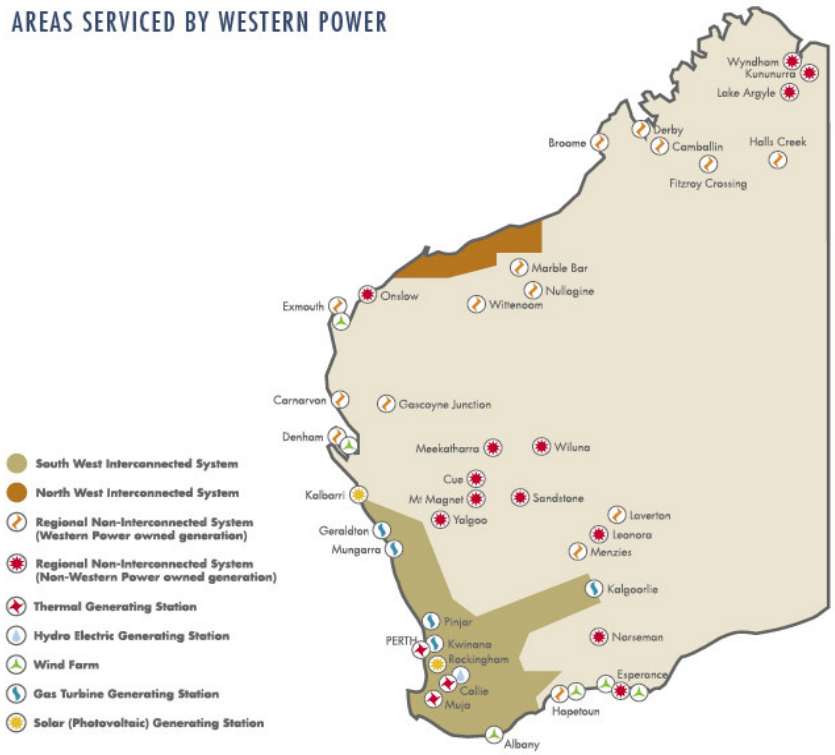
3.2 Brief overview of Western Power Corporation

Western Power Corporation is an integrated energy company which owns and operates generation, transmission and distribution infrastructure supplying electricity to over 860,000 customers in Western Australia.

The company has achieved substantial efficiency gains since the Government's reform program commenced. Customers have primarily benefited from these efficiency gains in terms of lower electricity prices. Specifically, electricity prices have fallen by an average of nearly 20 per cent in real terms over the past decade, while in 2001, the company committed to a pricing strategy under which there would be no increase in tariff charges for the following three years.

Western Power Corporation's industrial, commercial and residential customers are supplied with electricity via two major interconnected networks, the South West Interconnected System and the North West Interconnected System. Smaller distribution networks supply power to customers in 28 remote areas. Western Power Corporation owns about 56 per cent of electricity generation capacity in Western Australia with the remaining 44 per cent owned by private industry. Figure 1 below shows the areas serviced by Western Power Corporation.

Figure 1



3.3 Western Power Corporation's organisational structure

Western Power Corporation is committed to implementing the organisational arrangements required to ensure the delivery of the outcomes sought by the State Government's ongoing electricity reform program. In this context, structural change is deemed to be an important requirement, and Western Power Corporation is dedicating resources to ensure that the State Government's objectives are achieved.

Over the 2003/04 financial year, Western Power Corporation developed four strengthened business units within the company (networks, generation, retail and regional power) and additional effort is now being focused on increasing their degree of independence. This process is being reinforced through the development of formal agreements covering the provision of services from one business unit to another.

The *Electricity Corporations Bill 2005*, which received its second reading on 5 May 2005, would give effect to the restructure of Western Power Corporation by creating four new Government-owned corporations in the form of:

- A Generation Corporation, responsible for power generation within the South West Interconnected System (SWIS);
- A Networks Corporation, responsible for the transport of electricity within the SWIS;
- A Retail Corporation responsible for the sale of electricity within the SWIS; and

- A Regional Power Corporation responsible for the generation, transport and sale of electricity in all areas of the State outside of the SWIS.

The State Opposition has also accepted the arguments in favour of disaggregation, and a target date of 1 April 2006 has been set for commencement of operation of the four new businesses.

3.4 Statement of Strategic Intent

Western Power Corporation's Statement of Strategic Intent provides a focus for all of its efforts in the immediate future, and assists the company in setting priorities for all of its various programs. Under its Statement of Strategic Intent, Western Power Corporation's basic goal is "delivering value to Western Australians". To achieve this, the company must:[7]

1. Achieve a strong financial and operational performance particularly in the areas of:
   - competitive prices
   - supply reliability
   - returns to the owner

2. Be supported by key stakeholder groups including:
   - major industry groups
   - major customers' groups
   - our employees
   - our shareholder

3. Maintain Western Power's relevance, by:
   - delivering innovative services to our customers
   - raising awareness of our environmental achievements
   - promoting Western Power as a high performing Western Australian company

4. Achieve a strong financial and operational performance particularly in the areas of:
   - health and safety
   - developing individual relationships
   - fostering effective leadership and teamwork
   - being rewarded for good performance

The values and objectives embodied in this Statement of Strategic Intent underpin the proposed access arrangements described in this submission.

[7] All of the information cited regarding Western Power Corporation's Statement of Strategic Intent is reproduced from page 16 of Western Power's *Annual Report 2004.*

3.5 Western Power's covered network

As already noted, the Code only relates to Western Power's network in the South West Interconnected System (or SWIS). This network consists of transmission and distribution assets, and it extends from Kalbarri to Albany and across to the Eastern Goldfields. It contains more than 140 major substations, 6,000 km of transmission lines (operating at voltages of 66 kV and greater) and over 64,000 km of high voltage distribution lines (operating at 33 kV and lower).

Table 1 below provides a summary of the key assets which comprise the SWIS.

Table 1: Assets of the South West Interconnected System as at June 2004

	Overhead Assets	Underground Assets
South West Interconnected System Transmission Lines		
330 kV (km)	891	
220 kV (km)	655	
132 kV (km)	4435	9
66 kV (km)	1055	12
33 kV (km)	17	
South West Interconnected System Distribution Network		
High voltage mains (km)	58691	3655
Low voltage mains (km)	9896	8120
Total transformer capacity (MVA)	5236	
Streetlights	190007	

3.6 Network business' recent initiatives and achievements

The network business' recent achievements and initiatives to improve services to customers, and to increase the efficiency of its operations are summarised in Table 2 below.

Table 2 – Recent achievements and initiatives of the network business

Capital works programs to improve networks	Western Power's capital works program is targeted at continuing to ensure reliability of supply to customers as well as improving the environmental performance of the company's plant. It is recognised, however, that significantly more needs to be done if recent reliability concerns are to be properly addressed.
Delivering real benefits to rural Western Australia	In May 2004, the State Government launched a $49 million, four-year program to improve country electricity supplies. The program is funded jointly by the State Government and Western Power, and it demonstrates both the State Government's and Western Power's commitment to delivering a safe, reliable power supply in country areas. Rural areas will also benefit from the State Government's commitment to investing a total of $1.8 billion on the electricity network over the four years from 2004 to 2008. Spending will target maintenance, pole inspection and replacement, bushfire mitigation and capacity improvements.
Inaugural bushfire management plan	Western Power's inaugural bushfire management plan for the SWIS was launched in July 2003. Production of the five-year implementation plan involved extensive consultation with the Fire and Emergency Services Authority of WA and the Department of Conservation and Land Management.
Poletop fire strategy	Western Power's network service is affected by the continuing occurrence of poletop fires, caused by electricity arcing across salt and dust built up on insulators. In spite of the company's best efforts to attend to these incidents, poletop fires have been a persistent cause of supply interruption to many thousands of customers in the metropolitan area. In response, the company has developed new strategies of maintaining pole tops with the aim of reducing the incidence of these events in future years.
Placing assets underground to improve network efficiency	Since 1996, Western Power has managed the State Underground Power Program (SUPP) and has converted more than 31,000 homes and businesses from overhead power supplies to new underground connections. Round 3 of the program has now commenced, which will underground supplies to a further 5100 lots, including 10 projects in the metropolitan area, plus 9 Localised Enhancement Projects in Balingup, Bunbury, Carnamah, Collie, Geraldton, Guilderton, Lake Grace, Mt Barker and Nannup.

3.7 Challenges ahead

Although the network business has embarked upon a number of initiatives to deliver service improvements and enhance operating efficiencies, a number of important challenges need to be addressed in the forthcoming access arrangement period. In particular, the following issues will affect Western Power's expenditure plans:

- complying with more onerous safety, health and environmental obligations;
- maintaining sufficient network capability to meet growing demand in the SWIS, taking into account the much higher level of uncertainty associated with the

location decisions of Independent Power Producers entering the wholesale generation market;

- meeting customers' expectations with respect to supply reliability;
- servicing the increasing demand associated with continued urban infill, which is leading to increased pressures on the distribution network;
- timely reinforcement of the network to accommodate both the increasing demand and expected deterioration in system load factor due to increased domestic air conditioning load (which is highly temperature-sensitive);
- timely and efficient renewal of ageing network assets;
- facilitating market reform through the timely development of systems and processes;
- managing the competing demands on internal and external resources, whilst ensuring that customers receive value for money; and
- attracting and retaining specialist staff, and implementing effective succession planning in response to the issues associated with an ageing workforce.

These high-level challenges have important implications for the expenditure requirements of the transmission and distribution networks, and therefore are discussed in more detail in Parts B and C of this submission.

4 Network planning and investment process

4.1 Introduction

In this section, Western Power provides an overview of its network planning and investment process. This process drives the company's expenditure plans which are discussed in detail in Parts B and C of this submission.

The remainder of this section is structured as follows:

- section 4.2 provides an overview of Western Power's network planning process;
- section 4.3 discusses Western Power's network investment strategy; and
- section 4.4 explains how Western Power's planning and investment processes deliver expenditure plans that satisfy the Code's regulatory requirements.

4.2 Overview of Western Power's network planning process

Western Power's network development plans are based on regional forecasts of peak demand, assumptions about generation developments and a detailed understanding of the capacity of the existing network. These data and assumptions are used in sophisticated network analysis that assesses the ability of each network element to satisfy a number of planning and technical criteria necessary to deliver the required network performance and service standards.

For convenience, the network is considered to be divided into the bulk transmission network and a number of load areas. As a minimum, each load area is studied in detail every two years to ensure that it will continue to meet the relevant planning and technical criteria. Where there have been significant changes in a load area (perhaps due to significant load growth or a new generator connecting), the network will be re-assessed as a matter of priority. The network planning process is, therefore, a continuous one.

Three levels of demand forecast are required for network planning purposes:

- a demand forecast for the bulk transmission system, which is broadly based on the Generation Status Review demand forecasts, and which allows peak network flows across the bulk transmission network to be modelled;
- demand forecasts for each substation, which are developed by extrapolating previous system peaks for each substation, and which allow peak power flows across each substation element to be modelled; and
- demand forecasts for each load area, which allow peak power flows across the network elements in each load area to be modelled. These forecasts are developed using the bulk transmission forecasts and the individual substation forecasts.

In each case, the focus is on understanding the most onerous conditions that will affect each network element. For example, the bulk transmission network's most onerous power flows are at the time of system peak. An individual substation may have its peak load at a different time to the remainder of the network. Simply using a load forecast for the time of system peak would potentially understate the duty on each substation element, and lead to inadequate development plans. The most

onerous operating condition for each load area is derived from a combination of the demand at time of system peak and local demand peaks, depending on the characteristics of that load area.

The peak demand for electricity is highly sensitive to temperature. The forecasts used for network planning purposes are based on a 10% Probability of Exceedance: that is, Western Power's peak demand forecast, probabilistically, is likely to be exceeded one year in every ten.

Further information regarding Western Power's demand forecasts for the forthcoming access arrangement period is provided in Parts B and C of this submission.

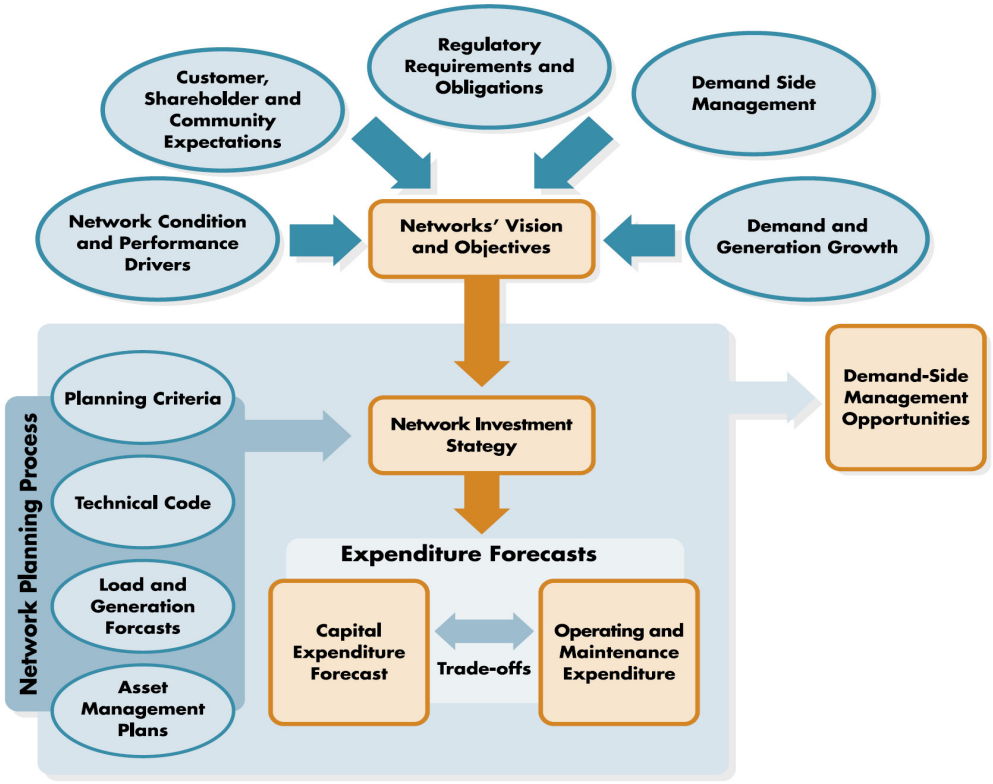
The timing, location and type of generation projects are the other main drivers of network investment. The need for network development is highly sensitive to the location and type of generation development. This is an important source of uncertainty that must be taken into account in developing expenditure forecasts. The role of the investment adjustment mechanism in managing this uncertainty is discussed in more detail in Part D of this submission. Further detail in relation to generation capacity forecasts is provided in section 3, Part B of this submission.

Western Power's planning process identifies a number of network constraints over the next ten years, based on the network planning assumptions (that is, demand growth and new generation developments) described in this submission. Depending on the nature of the network constraints, different solutions may be available. In some cases, it may be possible to avoid network augmentation if demand side or generation solutions are brought forward in the right locations.

Western Power publishes a Transmission and Distribution Annual Planning report, which provides existing and prospective network users and other interested parties with information on emerging constraints and major planned developments on Western Power's South West Interconnected System. An objective of this report is to encourage the development of non-network solutions to emerging network constraints.

Figure 2 below provides a useful summary of the company's network planning and investment process.

Figure 2: Western Power's network planning and investment process



4.3 Network investment strategy

Western Power's network investment strategy reflects the Statement of Strategic Intent (described in section 3.4 above), and its network planning process. Ultimately, the purpose of the investment strategy is to meet or exceed customer and community expectations regarding the quality and reliability of the electricity supply, and to deliver outputs that are consistent with sound engineering practice in terms of asset management and stewardship.

The investment strategy is to deliver expenditure plans that balance capital expenditure and operating and maintenance expenditure, with the objective of minimising the total life-cycle costs of delivering services. This trade-off between capital and operating expenditure necessarily requires the exercise of judgment, taking into account issues of risk and prudent asset management.

Risk management is an important consideration in developing any expenditure plans. Western Power identifies risk exposure through due diligence programmes, asset audits, analysis of performance history and other specialised risk analysis processes. Critical assets are treated in a standard risk management procedure. Special contingency plans are developed for significant risk scenarios. This information is taken into account in developing the company's expenditure forecasts.

Western Power applies widely accepted network investment criteria in order to balance network costs against the likely costs to customers of a less reliable supply. In effect, network expenditure is justified with reference to 'value for money' considerations. It is also important, however, that the requirements of the Technical Code are met and that all necessary work is undertaken in a manner that complies with relevant legislation, national standards and industry guidelines (including those

relating to occupational health and safety, environment and employment). In other words, a significant proportion of Western Power's forecast expenditure is not discretionary, as the expenditure must be undertaken in order to comply with legislated requirements.

It should also be noted that the planning process must manage the high level of uncertainty associated with the timing, size and location of potential future generation sources. The impact of this uncertainty is exacerbated by the time taken to complete major transmission network augmentation projects, such as the construction of 330 kV transmission lines required to accommodate large new generation sources. The construction phase of a generation project can take as little as two years, whereas establishing a new transmission line can take up to seven years from conception to commissioning. Much of the time required to establish a new transmission line is associated with the environmental processes that need to be completed to identify and gain approval for line routes.

Without the necessary network infrastructure to provide minimum levels of power transfer capability, generator outputs may need to be restricted to maintain network safety and security. Such restrictions may have an adverse impact on the development of a competitive generation market. Consequently, Western Power's planning processes are designed to identify universally required network developments and to commence investment to ensure that the network can respond to market needs in a timely fashion.

At a high-level, any network investment must be justified with reference to one or more of the following objectives:

- achieving and maintaining required service levels;
- reducing servicing and operating costs;
- optimising the economic life of equipment;
- ensuring safe operation of assets; and
- meeting regulatory and environmental requirements.

Ideally, maintenance expenditure should minimise the total life-cycle costs of providing network services, taking into account the future network renewal and development plans. Importantly, however, there are a number of other high-level drivers for maintenance expenditure, which include:

- ensuring the asset condition is kept within acceptable limits;
- operating the equipment at an acceptable level of risk; and
- meeting required performance targets and compliance obligations.

Western Power's asset management plans provide essential information to help guide the company's capital and operating expenditure decisions. The asset management plans are developed from information and analysis relating to:

- asset age and condition;

- the asset's expected role in the system taking into account potential obsolescence;

- the probability and consequence of failure;

- the physical and system environment of the asset;

- realistic asset decay predictions and subsequent life-cycle cost planning; and

- the need to ensure the long-term viability of the business, that is, to avoid reaching a situation where the overall condition of the network has declined to an unmanageable state.

All proposals for major expenditure are prepared using Western Power's economic assessment and project approval processes. These processes include a detailed operating and capital funding requirements review and prioritisation process, which is managed within Western Power's overall budgeting framework.

It is noted that resourcing and financing constraints must be fully considered before any expenditure proposals are finalised. This is an important issue for the forthcoming access arrangement period, which is discussed in detail in Parts B and C of this submission.

4.4 Compliance with Code's investment criteria

The Code establishes a "new facilities investment test" and a "regulatory test", with which Western Power's capital expenditure forecasts must comply. The new facilities investment test is defined in section 6.52. In particular, 6.52(b) identifies three separate elements of the test:

(i) either: the anticipated incremental revenue for the new facility is expected to at least recover the new facilities investment; or if a modified test has been approved under section 6.53 and the new facilities investment is below the test application threshold – the modified test is satisfied; or

(ii) the new facility provides a net benefit in the covered network over a reasonable period of time that justifies the approval of higher reference tariffs; or

(iii) the new facility is necessary to maintain the safety or reliability of the covered network or its ability to provide contracted covered services.

The regulatory test applies only to major augmentations. Further information in relation to the new facilities investment test and the regulatory test is provided in Part D of this submission. At this stage, however, it is important to note that the Code provides that forecast investment that is reasonably expected to meet the requirements of the new facilities investment test can be included in the capital base for the purposes of determining the company's revenue requirements.

Western Power recognises that its current planning and investment process will need to be fine-tuned to accommodate formally the Code requirements in relation to the new facilities investment test and the regulatory test. For the purposes of this submission, however, it is pertinent to consider whether the expenditure forecasts that are produced by the existing planning and investment process are reasonably

expected to meet the requirements of the new facilities investment test. To address this question, we examine briefly each of the three elements of the new facilities investment test.

In relation to the first element of the new facilities investment test, Western Power's capital contribution policy ensures that investment in relation to new connections will comply with this provision of the test. In particular, a capital contribution will be levied in respect of any connection that does not produce sufficient revenue to cover the incremental costs of that connection.

In relation to the second element of the new facilities investment test, Western Power is proposing to undertake expenditure in relation to improving the reliability of supply. However, this expenditure is predominantly operating expenditure, and therefore is not subject to the new facilities investment test. In any event, as explained above, Western Power has regard to the likely benefits of improving reliability to ensure that any expenditure is cost-effective. In this sense, Western Power's reliability-related expenditure will meet the spirit of the new facilities investment test, even though this test only applies to capital expenditure.

In relation to the third element of the new facilities investment test it is noted that Western Power's planning and investment process takes account of the Technical Code and other obligations prescribed by regulations and legislation. In essence, the inclusion of these compliance obligations in the current planning and investment process is consistent with meeting this third leg of the test, namely to meet "the safety or reliability of the covered network or its ability to provide contracted covered services". It is noted that a substantial proportion of Western Power's capital expenditure program is driven by compliance obligations.

In summary, therefore, whilst Western Power's planning and investment process does not specifically incorporate the new facilities investment test, Western Power believes that its capital expenditure plans comply with the test. It is further noted that the expenditure plans resulting from the planning and investment process will be further constrained by resourcing and financing considerations. The additional constraints on expenditure will ensure that projects will only proceed if they are compliance-related or produce high net benefits. This should provide further confidence that Western Power's capital expenditure program satisfies the requirements of the new facilities investment test.

Further details of Western Power's expenditure forecasts are provided in Parts B and C of this submission. This information will further support Western Power's view that the proposed capital expenditure complies with the requirements of the new facilities investment test.

5 Recent performance and future service levels

5.1 Introduction

This section presents information on Western Power's recent performance, in terms of network costs and reliability. Details of Western Power's future reliability targets and service obligations are also provided. These elements have an important bearing on Western Power's expenditure forecasts that are the subject of Parts B and C of this submission.

This section is structured as follows:

- Section 5.2 examines Western Power's recent network performance in terms of costs and service;
- Section 5.3 discusses Western Power's approach to setting future reliability targets; and
- Section 5.4 presents a summary of Western Power's overall service targets and obligations for the forthcoming access arrangement period, including its reliability targets.

5.2 Recent SWIS performance

5.2.1 Recent cost performance

Western Power operates a large and expansive electricity network servicing the majority of the Western Australian population. A geographical map of the SWIS has been included in section 2 of this Part A of this submission. The SWIS network contains:

- over 140 transmission substations;
- 6,750 kilometres of transmission lines and cables; and
- 83,000 kilometres of overhead and underground distribution networks.

It covers vast areas in the South West and the Eastern Goldfields of Western Australia which are heavily dominated by remote mining loads. The physical environment in which Western Power operates presents additional challenges, for example:

- the identification and rectification of faults may involve significant travel time; and
- coastal exposure, an arid interior and prevailing on-shore winds contribute to salt and dust pollution.

Unlike networks in the Eastern states, Western Power is virtually unable to call on additional resources from its neighbours, or to share a large pool of independent contractors. The relative isolation of the SWIS from other networks also contributes to a relatively challenging operating environment.

Together, all of these factors suggest that Western Power's recent cost performance should compare unfavourably with other network businesses across Australia.

Contrary to this expectation, however, recent studies undertaken by Meyrick & Associates and Benchmark Economics have all identified Western Power's network business as a better-than-average cost performer. For further details of these reports, please refer to appendices 1 and 2.

Notwithstanding the studies conducted by Benchmark Economics and Meyrick and Associates, Western Power recognises that cost benchmarking can only provide a partial indication of company performance. Specifically, benchmarking cannot readily provide definitive conclusions regarding a company's relative efficiency because it is practically impossible to normalise for the cost impacts of each company's unique operating circumstances.

The ACCC noted the challenges of conducting effective comparative benchmark in its Statement of Regulatory Principles – Background Paper, as follows:

> "The key issue in constructing exogenous measures is how they should be calibrated to take account of TNSPs' specific operating conditions. The ACCC is aware of the work undertaken by the Office of Water Services (Ofwat) in the UK and by other European regulators to develop comparative benchmarks and other partially exogenous measures to establish expenditure allowances.
>
> The ACCC considers that the development of comparative benchmarks has considerable merit since it would allow the ACCC to establish expenditure allowances without necessarily having to conduct exhaustive firm-specific cost analyses. The use of benchmarks offers the promise of less intrusive regulation. However, considerable work would need to be done to establish reliable benchmarks that produce fair and balanced comparisons between the TNSPs in the NEM."[8]

Western Power concurs with the ACCC's view that considerable work would need to be done to establish reliable benchmarks that produce fair and balanced comparisons between TNSPs, and network businesses more generally. Nevertheless, the analysis presented by Benchmark Economics and Meyrick and Associates suggests that Western Power's networks appear to be relatively low cost despite their challenging operating environment.

In this light, a key question for the forthcoming access arrangement period and beyond is whether the existing level of expenditure is sustainable. The expenditure forecasts presented in Parts B and C of this submission indicate that expenditure must increase if service performance and the reliability of the network are not to deteriorate unacceptably.

5.2.2 Recent service performance

In considering the sustainability of Western Power's existing expenditure levels, it is useful to assess the company's recent performance in relation to service levels. At a high level, it is well understood that service performance will tend to suffer if there is insufficient expenditure over the long-term to maintain and expand the operating capability of the asset base to meet customers' needs.

Although service performance has numerous attributes, the reliability of the network is a principal concern of customers, and Western Power must focus its efforts on improving, or at least maintaining network reliability in accordance with the needs and expectations of its customers. In a recent survey of its customers, 86% identified

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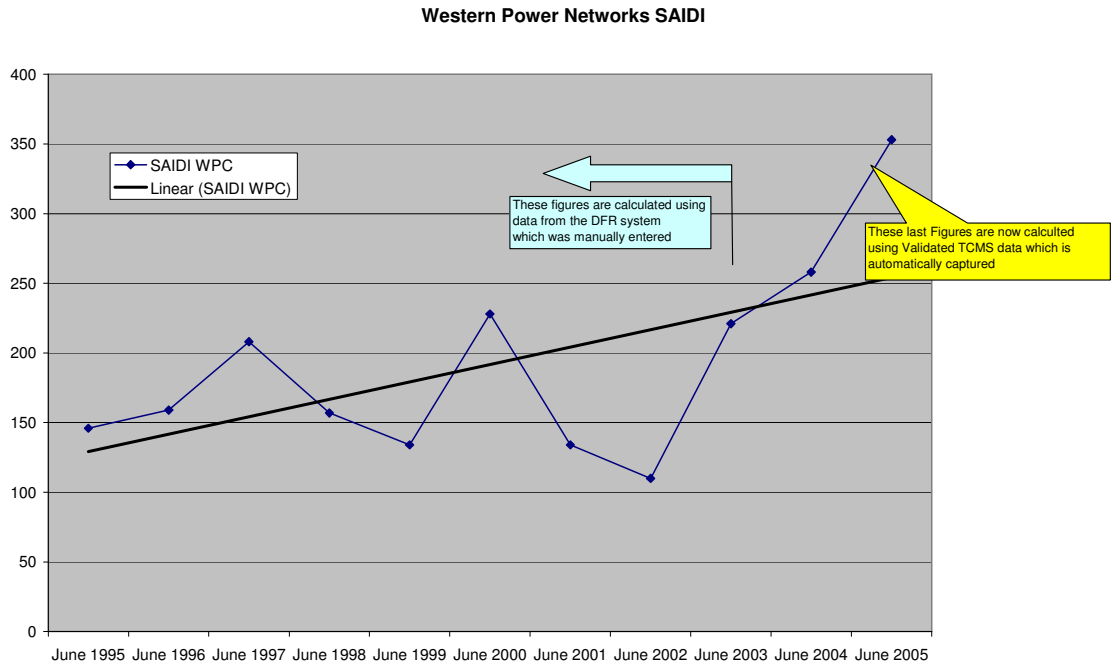
[8] ACCC, Statement of Regulatory Principles – Background Paper, December 2004, page 67.

reliability as a concern. Figure 3 below shows Western Power's SAIDI performance across the SWIS from June 1995 to June 2005.

Figure 3 - Western Power Network SAIDI

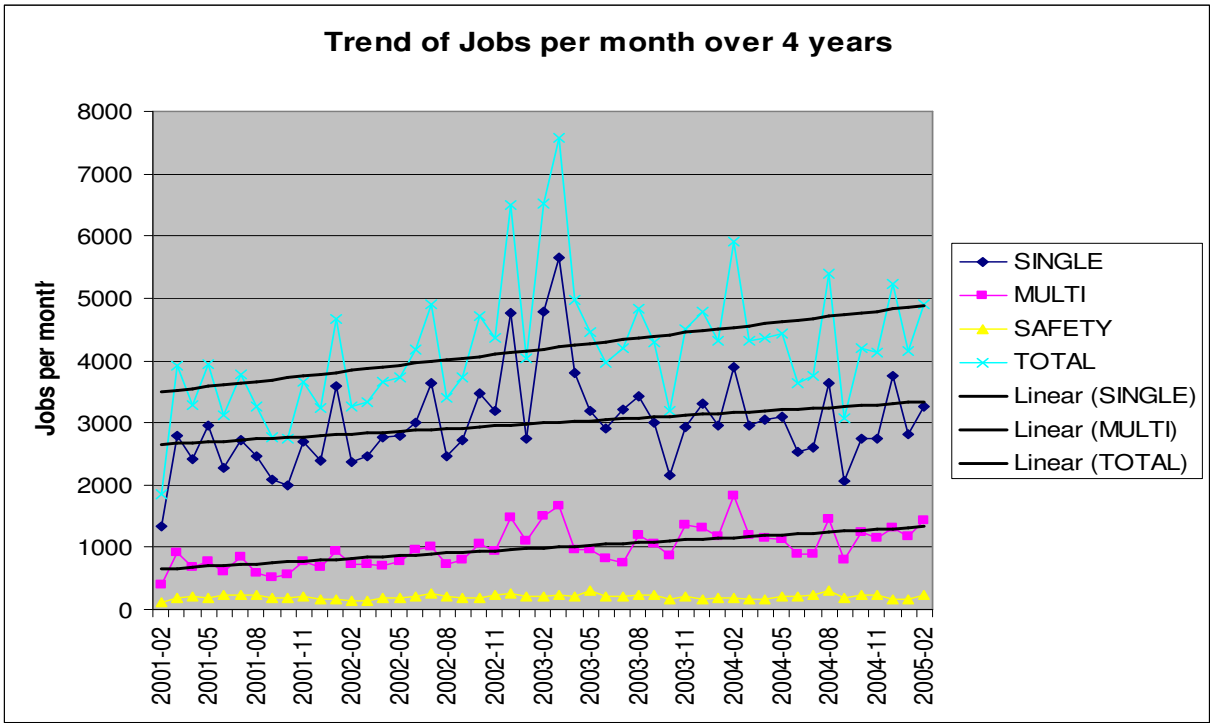


The above figure shows a worsening linear trend performance in relation to SAIDI from 1995 to 2005. Anecdotally, this worsening trend in performance has occurred at a time when customers expect better reliability from network services. The figure also shows significant annual volatility in performance, from a little over 100 minutes in 2002 to more than 200 minutes in 2003. Again, Western Power recognises that this apparent increase in the volatility of network performance falls short of meeting customer expectations.

Some important determinants of reliability performance, such as weather, are not within Western Power's direct control. Nevertheless, a worsening trend in performance such as that shown in Figure 3 above is a cause for concern. In particular, it may indicate that the company's recent expenditure levels and work practices should be enhanced.

Indeed, Figure 4 below lends further support to this view. It provides details of the number of network faults or incidents that the network business has responded to over the previous 4 years. It is evident from this figure that Western Power is attending more network faults with a trend increase over the 4 year period.

Figure 4 - Fault Jobs Trends



Overall, Western Power's recent cost and service performance indicates that expenditure levels will need to increase in order to arrest the recent decline in network reliability.

5.3 Western Power's approach to setting reliability targets

The recent deterioration in reliability performance raises the question of how future SAIDI reliability targets should be set. Conceptually, SAIDI performance should seek to minimise the total costs to customers, which comprises the indirect costs of reliability plus the direct costs of network services.

In this regard, useful information is available on the value that consumers typically place on marginal improvements in reliability. In particular, a report commissioned by VENCorp[9] estimated the marginal value of customer reliability (measured across all customers) to be approximately $29,600 per MWh as at December 2002. This estimate of the value of customer reliability provides a useful reference point for assessing whether increases in capital and operating expenditure to deliver reliability improvements are warranted.

A further important consideration is that the Electricity (Supply Standards and System Safety) Regulations 2001 set supply reliability standards that Western Power Networks must use all reasonable endeavours to meet.[10] Schedule 1 of Part 8 of the Regulations requires Western Power to achieve certain targets for outage duration

[9] Charles River Associates, *Assessment of the Value of Customer Reliability,* December 2002. A copy of the report is available from VENCorp's web site at: http://www.vencorp.com.au.

[10] Refer to Part 2 of the Regulations.

and frequency. These targets equate to a figure of 160 minutes per year (off supply) for the average SWIS customer[11].

It is noted that current SAIDI performance is substantially above (in other words, worse than) the 160 minutes per year (off supply) for the average SWIS customer, as prescribed by the regulations. However, Western Power believes that there are a number of factors that together suggest that the target for reliability performance should be less onerous than 160 minutes. These are as follows:

- The Regulation's reliability standards were established at a time when reliability data was captured in Western Power's Distribution Fault Recording system (DFR). Western Power has since replaced the DFR system with the Trouble Call Management System (TCMS). The TCMS system captures a broader range of outages and customer connection issues than the previous DFR system. As a result, the basis on which the reliability standards are expressed in the Regulations is not consistent with the basis on which Western Power now records SAIDI performance. In effect, if the reliability standards in the Regulations were restated on the basis of the TCMS system the SAIDI target in the Regulations would probably be less onerous than is presently the case.

- The definition of exclusions applicable to the supply reliability standards in the Regulations is different to that adopted by Western Power for SAIDI performance reporting purposes. Western Power's reporting of SAIDI performance would also imply a less onerous reliability target than that prescribed by the Regulations.

For these reasons, Western Power believes that it is appropriate to update the supply reliability standards contained in the Regulations to better reflect the present arrangements in relation to reporting faults. This is a matter that the company will take forward with the Office of Energy.

In setting reliability targets for the forthcoming access arrangement period, Western Power believes that it should have regard to the current level of SAIDI performance; the recent trend of deterioration in performance; and the competing demands on resources over the forthcoming access arrangement period. Taking all of these matters into consideration, Western Power has adopted a target of achieving a 25% improvement in SAIDI (compared to actual performance for the year ended in June 2004) over the forthcoming access arrangement period.

As noted in further detail in Part D of this submission:

- Western Power plans to adopt these SAIDI performance targets as the service standard benchmarks for the reference services it provides to users connected to the distribution network.

- Western Power also plans to adopt service standard benchmarks for transmission reference services which are consistent with these overall SAIDI performance improvement targets.

- Under the service standard adjustment mechanism (also discussed in detail in Part D of this submission) the company will face financial incentives to deliver services in accordance with the service standard benchmarks. In particular, the

[11] The target of 160 minutes is set based on a number of exclusions set out in the Regulations – where the event is beyond the control of Western Power.

company will face financial penalties if it fails to achieve the stated SAIDI improvement targets.

Details of this reliability target is provided in section 5.4 below, together with a description of Western Power's other service targets and obligations.

5.4 Summary of Western Power's service targets and obligations

This section summarises Western Power's service targets and obligations for the forthcoming access arrangement period. Where detailed obligations are prescribed in regulations or legislation, the title of the relevant document is noted and the scope of the regulation is described briefly.

The expenditure forecasts set out in Parts B and C of this submission reflect Western Power's forecasts of the efficient costs associated with complying with the requirements of all of the applicable statutory instruments, as well as achieving the network performance improvement goals the company has set for the forthcoming access arrangement period.

5.4.1 Reliability targets

The reliability performance targets to apply during the forthcoming access arrangement period are summarised in Tables 3 and 4 below.

Table 3: SAIDI service standard benchmarks for distribution reference services (expressed as system minutes per annum)

			First access arrangement period		
	Year ending June 2005	Year ending June 06	Year ending June 07	Year ending June 08	Year ending June 09
SWIS total	294	289	277	259	224
Urban	256	252	242	226	195
Rural	539	530	509	476	410

Table 4: Service standard benchmarks for transmission reference services (Circuit Availability expressed as percentage of total possible hours available, and Customer Minutes Interrupted)

	First access arrangement period		
	Year ending June 2007	Year ending June 2008	Year ending June 2009
Transmission circuit availability (% of total time)	98.67	98.67	98.67
Customer minutes interrupted (meshed network)	8.3	8.3	8.3

5.4.2 Customer Reliability Payment Scheme

On 31 March 2005, the Government announced that householders affected by power blackouts lasting 12 hours or more will receive a rebate from Western Power. The 'Customer Reliability Payment Scheme', took effect from 1 July 2005, and entitles households to an $80 rebate from Western Power in recognition of the inconvenience caused by blackouts.

The scheme is also aimed at increasing Western Power's accountability for network performance and providing an incentive to the company to improve the reliability of supply to customers. Under the scheme, Western Power will pay a rebate to affected customers regardless of the cause of the supply interruption except where the customer is clearly at fault. The scheme is separate to and does not negate the compensation process currently available to Western Power customers.

The scheme applies to Western Power customers who use less than 50 MWh of electricity per year.

5.4.3 Western Power's Networks Customer Charter

The Customer Charter applies to residential and small business customers using less than 50 MWh of electricity per year. This group of customers comprises some 98% of all customers. The Charter sets out comprehensive information about Western Power's network services and associated standards of service for these customers, along with these customers' rights and obligations in their relationship with Western Power's Network Business.

5.4.4 Regulations and legislative obligations

The forecasts of expenditure described in Parts B and C include the costs associated with Western Power's compliance with the following mandatory obligations over the forthcoming access arrangement period:

- The Electricity (Supply Standards and System Safety) Regulations 2001 contains various quality-related benchmarks.

- The Technical Rules set out the standards, procedures and planning criteria governing the construction and operation of an electricity network, and deal with all the matters listed in Appendix 6 of the Access Code.

- The Electricity Transmission Access Technical Code and the Distribution Technical Code and Planning Criteria establish standards for the connection of new users.

- Environmental Protection (Noise) Regulations 1997 prescribe limits for noise emissions, and methods for noise monitoring and control.

- Electricity Regulations 1947 prescribe network operator service standards; and standards for line worker and electricity worker safety.

- Occupational Safety and Health Act 1984 and Occupational Safety and Health Regulations 1996 promote improvements to working practices and facilitate the coordination of the administration of laws relating to health and safety.

- Environmental Protection Act 1986 provides for the Environmental Protection Authority for the prevention, control and abatement of pollution and environmental harm.

PART B: TRANSMISSION BUSINESS EXPENDITURE PLANS AND TOTAL REVENUE

1 Introduction to Part B

Part B of this submission provides detailed information to explain and substantiate the company's expenditure plans and the total revenue requirements of the transmission network.

In broad terms, the key underlying cost drivers of the transmission business are:

- the **standards** or **quality** of services and other outputs which Western Power plans to deliver over the forthcoming access arrangement period*;* and
- the **quantity** of the services to be delivered over the period.

Accordingly, the expenditure forecasts set out in this Part B reflect:

- the planned transmission service standards, including compliance with mandatory health, safety and environmental standards; technical standards; and performance targets as summarised in section 5 of Part A; and
- the forecast demand on the transmission system and the forecast of new generation developments, which broadly reflect the *quantity* of transmission services that the company is planning to provide.

This Part B is structured as follows;

- section 2 describes and substantiates the transmission system demand forecasts;
- section 3 describes and substantiates the generation capacity forecasts;
- section 4 describes and substantiates the transmission capital expenditure forecasts;
- section 5 describes and substantiates the transmission operating and maintenance expenditure forecasts;
- section 6 provides explanatory information relating to the asset valuation and depreciation costs for the transmission network;
- section 7 sets out the company's estimate of the cost of capital for the network business; and
- section 8 calculates and describes the total revenue requirement for the transmission network.

2 Transmission system demand and energy forecasts

2.1 Introduction

This section provides an overview of the transmission system demand and energy forecasts for the access arrangement period.

As noted in section 1 of this Part B, Western Power's transmission system demand and energy forecasts reflect the quantity of transmission services that are to be provided in the forthcoming access arrangement period. As such, these forecasts provide a foundation for the company's forecasts of network development capital expenditure (including load and generation-related). The forecasts also provide the basis for developing the company's proposed price control and tariffs from its target revenue.

In addition, section 4.3(d) of the Code requires that the *access arrangement information* must include information detailing and supporting the *service provider's* system capacity and volume assumptions. This section of the submission, together with section 2, Part C, is intended to discharge this Code obligation.

Western Power commissioned National Institute of Economics & Industry Research (NIEIR) to review the company's forecasts for energy and demand for the transmission network, for each year of the forthcoming *access arrangement* (2006-07 to 2008-09 inclusive). NIEIR was asked to verify that Western Power's forecasts were suitable for the purpose of establishing the *access arrangement*. Specifically, it was noted that the transmission energy and demand forecasts should be prepared on a consistent basis, and should be reconcilable to the forecasts contained in the Generation Status Review (GSR).

The remainder of this section is structured as follows:

- section 2.2 provides an overview of Western Power's forecasting methodology for transmission demand and energy forecast;
- section 2.3 presents the transmission demand and energy forecasts;
- section 2.4 summarises NIEIR's review of Western Power's forecasts; and
- section 2.5 provides some concluding comments.

2.2 Western Power's forecasting methodology for transmission demand and energy

2.2.1 Transmission demand forecast methodology

Power is transferred across the SWIS over the 330 kV and 132 kV bulk transmission networks from five major power stations (and a number of smaller inter-connected power stations) to twelve bulk supply terminals for transformation to lower voltages. Electrical energy is then distributed to a host of zone substations supplying localised areas via the sub-transmission networks operating at 132 kV and 66 kV voltages.

Each local area has its own unique growth characteristics, which influence the demand and energy forecasts. For example, the load areas supplying the northern and southern coastal areas are experiencing rapid load growth due to residential housing developments, whereas growth in the Eastern Goldfields area is highly

sensitive to the activities of mining companies in response to world metal prices. As might be expected, the greatest distinctions are between load areas that cover urban and rural load areas.

Western Power currently prepares 20-year zone sub-station demand forecasts. These demand forecasts form the foundation of Western Power's network planning and analysis described in the company's Transmission and Distribution Annual Planning Report.

The network business' forecast methodology produces three different demand forecasts for the network. These are:

1. A coincident summer network peak demand forecast across all zone sub-stations to 2024. That is, a coincident forecast when the overall bulk transmission system is at its peak. This would usually be consistent with when the SWIS system peaks on a generation basis and, therefore, the forecasts should approximately match the GSR forecasts;

2. A non-coincident summer peak demand forecast for all zone sub-stations to 2024; and

3. A non-coincident summer peak demand forecast for SWIS terminal stations.

The non-coincident peak forecasting methodology is based on statistical analysis of historic load information for every sub-station and terminal station. Specific 'out-of-the ordinary' block loads are also explicitly taken into account.

All data used in the forecasting model is obtained from an IRIS database of 5 minute SCADA readings for every feeder at every zone sub-station on the Network. Logarithmic, linear, exponential and power curve fits are calculated from the historical data for each sub-station and terminal station. The equation with the highest multiple regression coefficient (or fit) is automatically selected. Some trends are adjusted to reflect historical load transfers and past/future block loads at sub-stations. Trends are also adjusted to allow for 1 in 10 year conditions.

Only sub-stations that have at least four years of historical values are trended forward. Sites with less data or new sub-stations are checked against the system peak trend and further adjusted, if required. The forecasts are also compared against the Contracted Maximum Demand (CMD) for particular sub-stations.

2.2.2 Transmission energy forecast methodology

Western Power previously used NIEIR to prepare the system demand and energy forecasts for the SWIS which were published in the GSR.

The NIEIR forecasting methodology employs a regional economic model of the Western Australian economy as an input to the transmission energy forecasts. The model disaggregates NIEIR's State forecast of gross State product (by industry) into sub-divisions across Western Australia. Transmission energy forecasts for industrial and domestic customers were assessed using different econometric models.

For industrial transmission energy forecasts, Australian Standard Industrial Classifications (ASIC) reflect the industrial composition of each region. The regional energy forecasts for industrial customers were determined by:

- the forecast outlook for ASIC industry growth in the relevant SWIS region; and

- the structural parameters and relationships embodied in NIEIR's industry based Western Australian electricity demand model.

For residential customers transmission energy forecasts were derived by forecasting the average electricity sales per customer and customer numbers for each year. The product of these two annual forecasts then determines the energy forecast for domestic customers for that year.

The average electricity sales per customer were assessed using a regression model incorporating real household disposable income per capita, real residential electricity prices and a weather adjustment variable (relevant only for one year out). The relevant income and price elasticities of demand for the residential sector are again taken from NIEIR's Western Australian electricity model.

Residential customer number forecasts are closely linked to NIEIR's forecasts of the dwelling stock for the relevant distribution area. NIEIR's regional economic models include projections of population, household formation, dwelling construction activity and the dwelling stock for each sub-region. These models are used to derive customer numbers.

2.3 Western Power's transmission demand and energy forecasts

Figure 2.1 below and table 2.1 (reproduced from page 4 of the NIEIR report) show the historic and forecast MW demand on the transmission system. In particular, Table 2.1 shows the summated diversified transmission demand forecasts at the zone sub-station level (graph "Input to Network") and the system demand forecasts published in the GSR (graph "GSR 2004 10% MED MW"). The zone sub-station forecasts are more granular than the GSR forecasts and, therefore, provide a more appropriate foundation for Western Power's transmission investment plans. The consistency between the zone sub-station and GSR forecasts provides a high degree of confidence that the zone-substation forecasts are robust and fit for purpose.

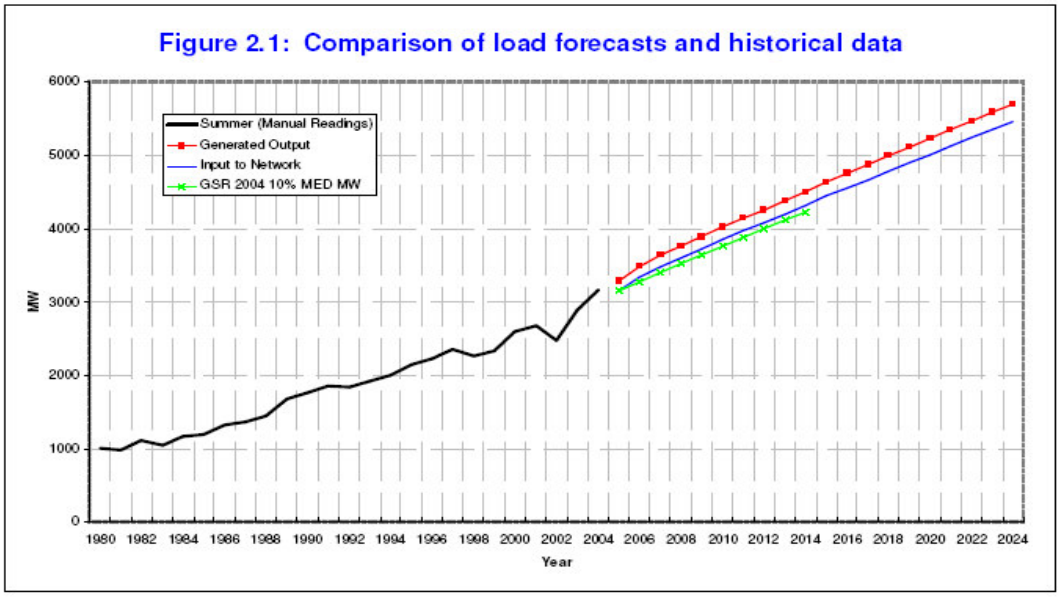


Table 2.1 Comparison of 2004 medium 10 per cent GSR forecast with WPC – NBU input to network forecast (MW)

	Input to network	GSR 2004 10% medium
2005	3149	3148
2006	3339	3276
2007	3484	3403
2008	3597	3528
2009	3725	3639

Table 3.2 below (reproduced from page 11 of the NIEIR report) provides details of Western Power's transmission energy forecast as presented in the GSR. The energy forecast are most relevant to the setting of the price control formulae (which Western Power proposes to be a revenue yield approach), but these forecasts have minimal impact on the company's transmission investment plans.

Table 3.2 Projected transmission energy – WPC	
Financial year	Medium (GWh)
2000-01	12,700
2001-02	12,793
2002-03	13,298
2003-04	13,742
2004-05	14,372
2005-06	14,844
2006-07	15,388
2007-08	15,954
2008-09	16,368
2009-10	16,938
2010-11	17,503
2011-12	18,121
2012-13	18,673
2013-14	19,287
Average growth (per cent)	
2004-05 to 2013-14	3.3

Source: 2004 GSR, pp.47.

2.4 NIEIR's review of Western Power's transmission forecasts

In relation to Western Power's transmission demand forecasts, NIEIR commented that:

- Overall, from NIEIR's meeting with officers of WPC, their modelling approach is sound. They have a good understanding of the input data which is of high quality and is quality controlled during processing.

- Western Power's purpose built model for demand forecasting contains a comprehensive framework for forecasting zone sub-station peaks. Of the in-house network demand forecasting models that NIEIR has reviewed for various businesses across Australia, the WPC model appears to be one of the best.

- NIEIR reinforces and agrees with Western Power's approach that planning should be undertaken at the zone sub-station level, in order to take into account regional specific information.

In relation to Western Power's transmission energy forecasts, NIEIR confirmed that the forecasts are consistent with the transmission energy forecasts published in the 2004 GSR.

For full details of NIEIR's analysis and findings, interested parties should refer to the NIEIR final report which is provided at appendix 3 of this submission.

2.5 Concluding comments on energy and demand forecasts

This section has explained:

- Western Power's methodology for forecasting transmission system demand and energy over the forthcoming regulatory period;

- Western Power's forecasts for transmission demand and energy; and

- NIEIR's comments on Western Power's methodology and proposed forecasts.

Western Power's view is that the information presented demonstrates that Western Power's transmission demand and energy forecasts are robust and fit for purpose. In particular, the forecasts used are broadly consistent with the GSR forecast, taking account of the need for more granular transmission demand forecast in order to inform Western Power's transmission investment plans.

Updated transmission demand and energy forecasts are expected to become available during the Access Arrangement review period. In particular, the Independent Market Operator recently published its "Statement of Opportunities, South West Interconnected System, July 2005" document. However, to date, Western Power has been unable to reconcile its forecasts with those of the IMO.

In any event, it is planned to use the most up-to-date forecasts available during the latter stages of the Authority's Access Arrangement review process as the basis for final revenue and price setting prior to the final approval stage.

3 Generation capacity forecasts

3.1 Introduction

This section provides an overview of the generation capacity forecasts for the access arrangement period. As noted in section 1 of this Part B, new generation connections and demand together define the quantity of services that must be provided by the transmission business. Without the necessary network infrastructure to provide minimum levels of power transfer capability, generator outputs may need to be restricted to maintain network safety and security. Such restrictions may have an adverse impact on the development of a competitive generation market.

As a consequence of the establishment of a competitive market in generation, Western Power can no longer influence the location, timing, and size of new generation plant connecting to its network. Western Power is therefore entering a period of much greater uncertainty with respect to generation connection capital expenditure, in terms of connection costs, and shared network augmentations.

Western Power's seeks to manage this uncertainty through scenario planning.[12] The purpose of this section is to provide a high-level overview of the key drivers for new generation capacity, and to provide an indication of the quantum of new generation projects that are expected to proceed in the forthcoming access arrangement period. The impact of this increased capacity needs to be reflected in Western Power's capital expenditure forecasts for the forthcoming access arrangement period.

The remainder of this section is structured as follows:

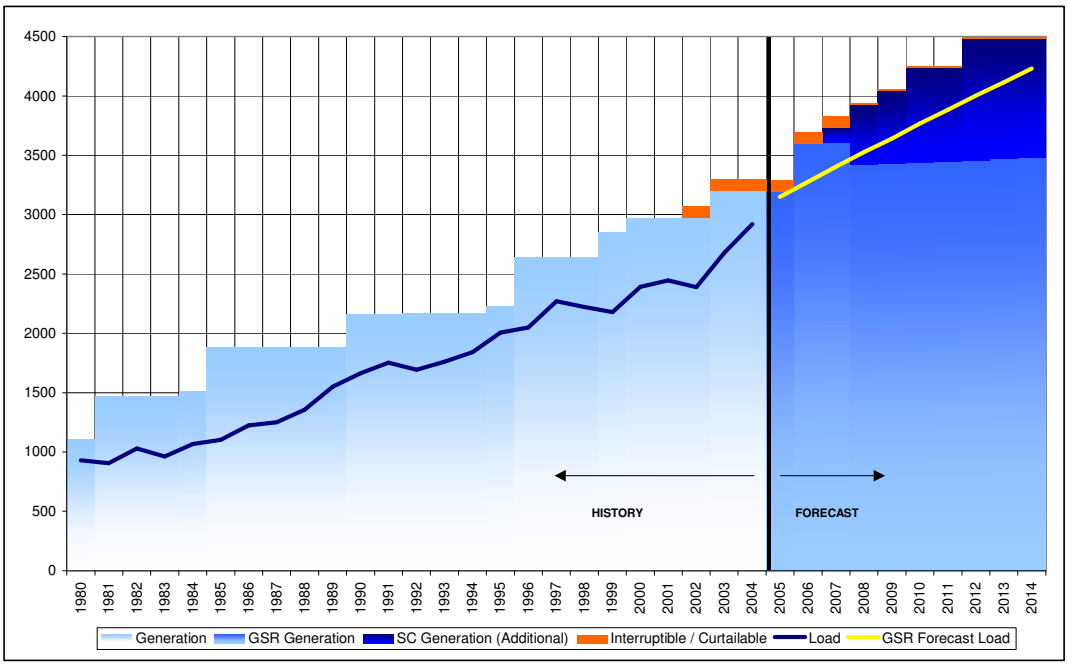
- section 3.2 provides a summary of historic and forecast generation connections; and
- section 3.3 provides some concluding comments.

3.2 Historic and forecast generation connections

Historically, generation capacity has tended to be added to the SWIS in large increments every 3 to 5 years. The addition of generation capacity has been necessary given the increasing demand on the transmission system, which has tended to accelerate in recent years. The last significant generation connection was in 2003, with prior significant connections in 1999 and 1996. Figure 5 below shows that the reserve margin (the gap between generation capacity and maximum system demand) has narrowed sharply in recent years.

[12] Further details of Western Power's planning process are provided in section 4 of Part A of this submission.

Figure 5 - Historical and forecast generation connections



The establishment of a competitive generation market, particularly at a time when reserve margins are low, introduces a new dynamic into transmission network planning. At this time it appears that the majority of new generation connections will be of a smaller size and/or in different locations, rather than the more "lumpy" additions of larger generators or multiple generators at the same site. This expectation is refected in the forecasts of generation capacity for 2006 to 2010 in the Figure 5. The impact of these more numerous and smaller connections is that total connection and network reinforcement costs will be higher than recent historical levels.

The 2004 Generation Status Review (GSR) reports that 2,020 MW of new generation capacity may connect to the SWIS during the next 5 years. A significant proportion of this capacity is proposed to be located south of the Perth metropolitan area in the region between Pinjarra and Collie. The main factors driving this predominant location are:

- proximity to a developed coal source;
- access to the Dampier-Bunbury gas pipeline;
- the suitability of the area to renewable energy wind and biomass development;
- the presence of major established industries requiring steam with an option for cogeneration;
- the environmental suitability of the area to further power station development; and
- access to suitable land, water and other infrastructure.

Western Power has developed generation scenarios based upon its knowledge of the announced projects, and the relative probabilities of new generation development occurring in particular locations. An important driver of the expected increase in

generation capacity is a recognition that existing reserve margins would need to increase.

The general guidelines for the selection of generation proposals for inclusion in the future generation development scenario were as follows:

- Precedence was given to generation proposals contained in the 2004 GSR or well developed proposals that have been announce since publication of the 2004 GSR.

- Precedence was given to generation proposals that are well developed and are currently making progress with access studies and applications.

- Precedence was given to generation proposals that are of a size that will provide a substantial portion of the new capacity required to meet the reserve margin each year.

- Generation proposals not included were either relatively underdeveloped proposals, proposals that were relatively small in size and insignificant to overall generation planning, or proposals with a history of deferral.

Based upon this assessment, Western Power's network business considers the following projects constitute a reasonable generation development scenario for the forthcoming access arrangement period.

Committed projects (and the year in which the projects are expected to be commissioned) are as follows:

- Kemerton, 260 MW in 2005;

- Alinta 1, 150 MW in 2005;

- Walkaway Windfarm, 90 MW (intermittent capacity) in year 2005; and

- Alinta 2 150 MW in 2005.

Table 5 below shows the assumed generation connections and decommissioning.

Table 5: Assumed generation connections & decommissionings[13]

Emu Downs Windfarm	Nov 2006	80 MW
Albany Windfarm Stage 2	**Nov 2006**	**14 MW**
Alinta 2 (Pinjarra)	**Nov 2006**	**140 MW**
Alinta 1 & 2 Wagerup	**Nov 2007**	**280 MW**
Worsley	**Nov 2007**	**120 MW**
Bluewaters 1	**Nov 2008**	**200 MW**
Collie 2 (PPP2)	**Nov 2008**	**300 MW**
Kwinana A/B	Nov 2008	-388 MW
Bluewaters 2	**Nov 2009**	**200 MW**
Cockburn 2	Nov 2011	240 MW

3.3 Concluding comments in relation to generation capacity forecasts

This section has briefly outlined the expected increase in generation capacity that the transmission system must accommodate over the forthcoming access arrangement period. As noted in section 1 of this Part B, the forecast generation capacity together with the forecast demand on the transmission system effectively define the quantity of services that the transmission network must provide.

The generation reserve margin has narrowed in recent years, and this is expected to be addressed in the forthcoming access arrangement period by the addition of new generation capacity. However, the introduction of competition in the generation market means that Western Power will have little influence on the location, scale and timing of the new generation capacity. In addition, the transmission business expects the increments of generation to be smaller, and therefore the number of new connections is also expected to increase compared to historic levels.

Western Power expects that much of the additional generation capacity will seek connection in the South West area of the SWIS. This enables the transmission business to anticipate some of the network investment that will be required to facilitate the connection of the new generation capacity. However, the uncertain nature of the transmission costs raises important regulatory issues in relation to whether Western Power or its customers should bear the risk of cost forecast errors. This issue is discussed in more detail in Part D of this submission.

[13] Projects in bold indicate a South West location.

4 Transmission capital expenditure

4.1 Introduction

This section describes and substantiates the capital expenditure forecasts for the transmission network.

The capital expenditure requirements of the transmission network should achieve the following outcomes:

- network asset condition and service performance should comply with all relevant legislation and regulations;
- service performance should also meet customers' expectations in terms of reliability and quality of supply;
- generation connections should be facilitated to ensure that security of supply is maintained;
- assets must be renewed to ensure that service performance is not compromised in the medium term; and
- the life-cycle costs of providing transmission services should be minimised by appropriately balancing operating and capital expenditure.

In addition, it is essential that expenditure plans are feasible given the availability of internal and external resources, and the need to ensure that expenditure is executed efficiently. Furthermore, the resulting prices to Western Power's customers must be acceptable – taking into account the competing demands for better service and the desire to minimise price increases where practicable.

The purpose of this section is to provide more information on the cost pressures in the forthcoming access arrangement period, noting the key changes from the recent past that must be addressed. Western Power accepts, however, that it is not practical or desirable to accommodate all of the pressure to increase expenditure in the forthcoming access arrangement period. Instead, the company intends to propose expenditure that is compatible with improving service delivery, whilst recognising the constraints that must be applied to ideal levels of expenditure in order to ensure that plans can be met without substantially compromising efficiency or long-term price stability.

The remainder of this section is structured as follows:

- section 4.2 summarises the drivers for increased expenditure in the forthcoming access arrangement period;
- section 4.3 explains how Western Power has constrained its expenditure proposals to ensure that the plans can be delivered efficiently and to ensure that financing and pricing considerations are also properly addressed; and
- section 4.4 presents Western Power's transmission network capital expenditure proposals.

4.2 Drivers for increased transmission capital expenditure

In relation to transmission network capital expenditure, there are six principal drivers for increased expenditure from historic levels. These are:

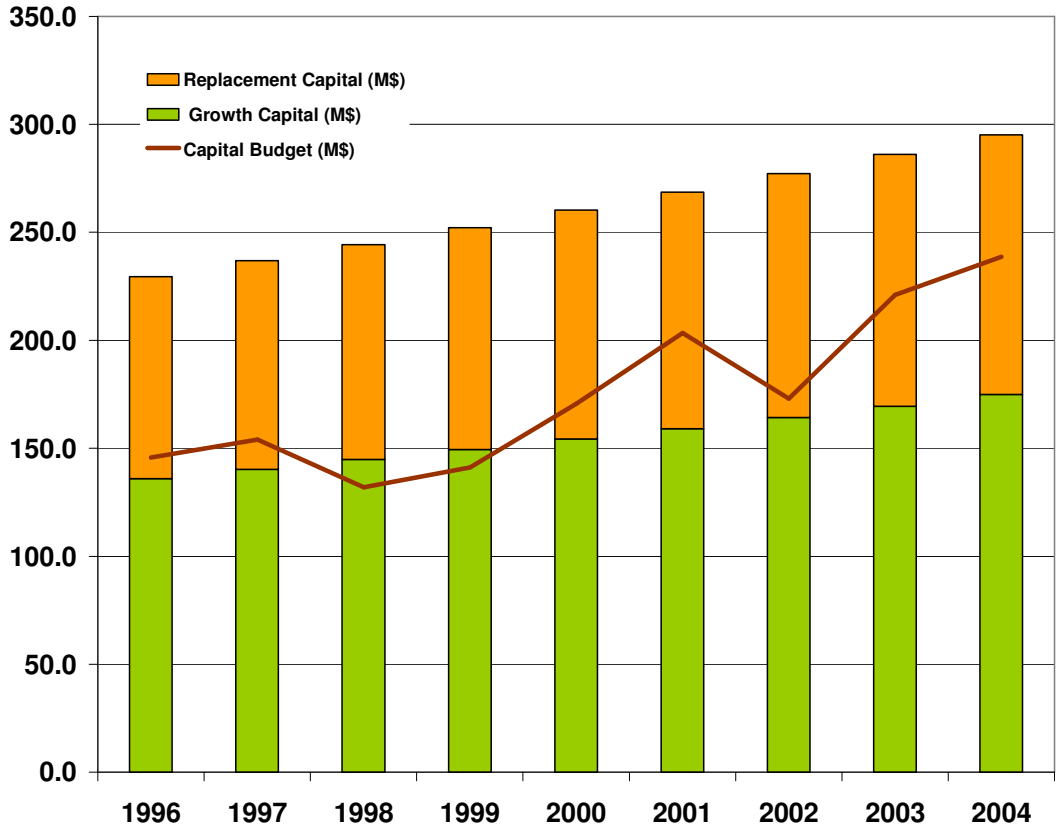
- the impacts of previous budget constraints;
- facilitation of market reform;
- asset replacement;
- facilitate the connection of additional generation capacity;
- Achieving and maintaining network performance in accordance with approved planning criteria; and
- compliance with more onerous safety, health, and environment regulations.

The first two of these drivers affect both the transmission and distribution networks, whereas the latter four drivers specifically relate to the transmission network. For ease of reference, all six drivers are discussed in the remainder of this section.

4.2.1 Impact of previous budget constraints

Over recent years, Western Australia has continued to enjoy a period of high economic and population growth. Unfortunately, Western Power's capital expenditure budget for its network business has remained at a level that has barely allowed the business to undertake new customer works. Figure 6 below shows that a substantial amount of replacement capital expenditure has not been undertaken as a result.

Figure 6 – Growth and replacement capital requirements and budget (Nominal dollars)



At current levels of capital expenditure, Western Power is replacing less than 0.5% of its system per year. This level of capital expenditure is unsustainable given that a typical network business with asset lives of 40-50 years would expect on average to replace between 2% and 2.5% of its capital base per annum. Unsurprisingly, therefore, Western Power has a growing backlog of assets that are identified for repair and replacement. Western Power has identified $40 million of backlog replacement capital expenditure in the transmission network.

Whilst it is not unusual for a network business to operate with some element of backlog expenditure, in Western Power's view it is important that the current level of backlog is not allowed to increase further. Arresting the growth in the replacement backlog will itself require an increase in replacement capital expenditure in the forthcoming access arrangement period. Of course, the extent of the increase is a matter of judgement, given the age profile of the asset base; the condition of the assets; and the overarching need to ensure that expenditure remains at a manageable level both from the perspective of Western Power's customers and in terms of ensuring efficient execution of projects.

4.2.2 Facilitation of market reform

It is important that Western Power fully supports the implementation of market reforms, including the facilitation of competition and the disaggregation of the transmission and distribution networks. The market reforms will have the most significant impact upon Western Power Network in the Information Technology area, although structural changes will impact all areas of the business. The projects that have been identified by Western Power Network as being required to facilitate competition or disaggregation include the following:

- **Standalone business systems** - Works include Internet, Intranet, MIMS, Financial modelling, Treasury, DMS, Messaging.

- **Networks Customer Information System** – This involves replacement of current systems and processes with an off-the-shelf package that supports access billing, and provides the network business with capability to manage customers (retailers and non-energy customers) in a deregulated environment as an independent business unit.

- **Interface to the Interim Market & Transitional Provisions** – This involves an information access portal that provides information sourced from operational systems to meet the Interim Market & Transitional Provisions as at July 2006.

- **Metron** – This is a Metering Business System to enable the dissemination of metering data to the Western Australian Energy Market participants.

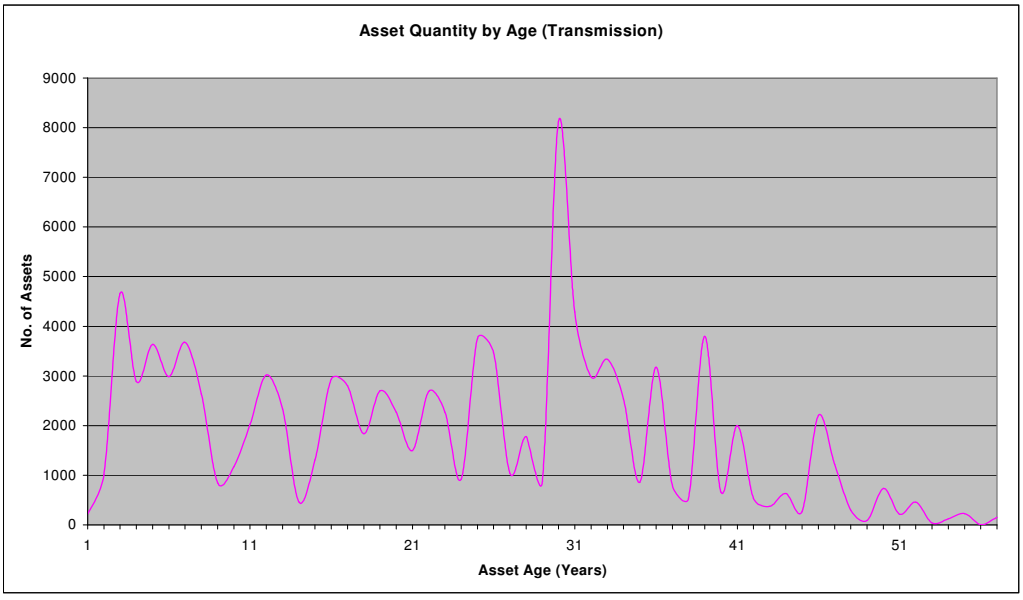
- **Compliance reporting** – Works include determining compliance reporting needs and the implementation of a solution to best meet the needs of Western Power and the Authority.

These projects will have capital expenditure implications for both the transmission and distribution networks. At this stage, however, it is noted that the market reform programme will have a material impact on capital expenditure requirements during the forthcoming access arrangement period.

4.2.3 Asset replacement

The advancing age of Western Power's transmission network means within the next 10 to 15 years, there will be a need to replace much greater volumes of assets than has been the case in the last ten years. Figure 7 below shows an installation age profile for the transmission assets. This figure indicates the large number of assets that were installed around 30 years ago. Noting that transmission asset economic lives are generally in the order of 40-60 years, this data clearly shows that Western Power is entering a period of increasing need for asset replacement.

Figure 7: Transmission asset age profile



The ageing asset base reinforces the view expressed in section 4.2.1 above that the existing level of replacement expenditure is not sustainable, even in the short to medium term.

4.2.4 Facilitate the connection of additional generation capacity

In section 3 of this Part B, it was noted that increases in forecast generation capacity will have an impact on network expenditure. The precise location and quantity of new generation capacity cannot be known with certainty. Therefore, it is difficult to forecast the precise impact of new generation capacity on transmission network capital expenditure.

As noted elsewhere in this submission, without the necessary network infrastructure to provide minimum levels of power transfer capability, generator outputs may need to be restricted to maintain network safety, reliability and security. Such restrictions may have an adverse impact on the development of a competitive generation market. They may also lead to undue increases in the overall cost of electricity supply within the SWIS. It is therefore imperative that sufficient capital expenditure is allowed to facilitate connection of new generation capacity.

In Western Power's view, the bulk transmission network will require a significant level of network investment to allow the system to accommodate the expected increase in generation capacity and still comply with the performance levels specified in the Technical Rules. Generation scenario analysis, combined with power system modelling assist Western Power in identifying the network investment likely to be necessary to meet existing planning criteria.

It is also noted that the increasing demand and energy requirements of customers, as described in section 2 of this Part B of the submission, will also drive future network capital expenditure. It is noted, however, that whilst these increased demand and energy requirements will affect capital expenditure, this particular driver is not expected to result in a material increase in expenditure over historic levels. Notwithstanding this observation, connection of bulk loads to the transmission system can lead to significant and lumpy network capital expenditure.

4.2.5 Achieving and maintaining network performance in accordance with approved planning criteria

In the 1990s the company allowed certain substations to be loaded to 90% of the normal cyclic rating (NCR), providing that a rapid response spare transformer (RRST) was available in the event of a transformer failure. It is now recognised, however, that this approach is not consistent with current engineering best practice.

Although the adoption of this policy has been successful in managing the capital expenditure restrictions noted in section 4.2.1, it has resulted in an increasing utilisation of the substations. As the average loading level of substations across the system increases, it is becoming increasingly difficult to operate the network under contingency conditions, and the risk of loss of supply is increasing.

This problem is accentuated by the fact that the lower margins of spare capacity do not cater for the less predictable surges in demand growth that are now being experiencing due to the unprecedented use of air conditioners. In addition, the implementation of the NCR criteria has now reached a stage where deferral of capex is more difficult as the criteria is fully implemented in many substations. This means

that a natural point has been reached where transmission expenditure will need to ramp up to meet even normal load growth.

Following a number of widespread outages in Queensland, the state government commissioned a report into the electricity networks operated by Energex and Ergon Energy. This report[14] highlighted substation planning practices and high levels of utilisation as contributory factors in the outages. It is important for Western Power to learn from the findings in Queensland, and in this regard the company now believes that a more conservative NCR criterion should be adopted.

In Western Power's view, it is important that the capital expenditure in the forthcoming access arrangement period winds back the loadings on Western Power's substations. The rate and extent of this 'wind back' is a matter of engineering judgement. It is important to note that increasing the level of system utilisation has enabled the company to meet its capital expenditure budget constraints. As a minimum, however, system utilisation cannot continue to increase without unacceptably compromising supply reliability. Moreover, as demonstrated by the recent experience in Queensland, it would be prudent and efficient to undertake expenditure that facilitates some reduction in the presently high levels of utilisation across the network.

4.2.6 Compliance with more onerous safety, health, and environment regulations

As noted in section 5 of Part A of this submission, Western Power's expenditure in relation to safety, health and environmental regulations is not discretionary. In the forthcoming access arrangement period, and in consultation with the relevant authorities, Western Power has identified the following specific capital expenditure projects that are required in order to ensure the company's compliance with existing regulations:

- substation fencing and security upgrades;
- transmission line river crossing;
- replacement of 216 22 kV bus disconnectors;
- transmission substation safety upgrades; and
- transformer neutral earthing resistors.

The completion of these non-discretionary projects will require additional capital expenditure compared to recent historic levels.

4.3 Western Power's approach to constraining capital expenditure

In Section 4.2, six principal drivers for increases in transmission network capital expenditure were identified. With the assistance of PB Associates, Western Power has undertaken a detailed and comprehensive assessment of its capital and operating expenditure necessary to deliver all the required performance outcomes (safety, new customer connections, reliability, prudent asset management, etc.). The expenditure report (attached to this submission at Appendix 7) details Western

[14] Electricity Distribution and Service Delivery for the 21st Century, prepared for the Queensland Government, July 2004.

Power's expenditure needs, taking account of resource constraints but assuming no financing or pricing constraints.

In relation to the transmission network, the pre-constrained capital expenditure assessment showed a significant increase in requirements compared to recent historic levels. The challenge facing the network business is to balance these increased capital expenditure requirements against the inevitable resource and financing constraints that must also be addressed.

Western Power's network business has adopted two key strategies for meeting the challenges in the forthcoming access arrangement period and beyond:

1. **Extend the capability of the in-house resources** to deliver more projects using in-house resources and out-sourcing, and

2. **Encourage the external market to progressively build its capacity** to assist the business to deliver the total project workload by:

   (i) immediately increasing the number of projects (or part projects) that are out-sourced, and

   (ii) giving clear signals to the market about the type and extent of project workload that will be outsourced over the next four to five years.

These strategies require several complementary initiatives (all of which are underway) to reduce the risk of poor project outcomes and/or delivery failure:

1. **The Program Management Office** has been established to efficiently manage the program of work (that is, to set priorities, allocate work to in-house and outside resources, confirm aggregated materials requirements as early as possible for the ensuing financial year, and report progress to management);

2. **The Flexible Resourcing Office** has been established to focus on managing the portfolio of out-sourced work and to assist with building the skills needed to successfully out-source large packages of work, and

3. **The Works Management System** has been implemented, the two key purposes of which are to: (i) provide a dynamic view of the status of the program of work in order to facilitate the efficient management of work; and (ii) provide an integrated view of resource capability, facilitating optimum resource allocation.

These initiatives are aimed at improving the business' capacity to deliver an increased quantity of projects without compromising cost efficiencies. Notwithstanding this, the business recognises that resource constraints will prevent the business from undertaking the whole of the unconstrained expenditure program.

Western Power's capability to undertake the increased expenditure required over the forthcoming access arrangement period is dependent on the ability of its suppliers and contractors to provide the necessary resources (including materials, labour and plant). The capability of suppliers and contractors will be limited because most other network businesses in Australia are also commencing similar increased investment programs. Consequently, Western Power's assessment of capability is somewhat more conservative than industry's advice in this regard.

The 'resource-constrained' forecast transmission capital expenditure plan entails $208 million in 2005/06, growing to $264 million in 2006/07, $272 million in 2007/08, and $291 million in 2008/09. The combined capacity of the network business' in-house resources and the external market to undertake the associated work plans is estimated to be adequate. This conclusion is based on:

- the planned extension of Western Power's in-house capabilities, coupled with targeted productivity improvements of 5% per year, which will enable the company to undertake $150 million per annum worth of works in-house;

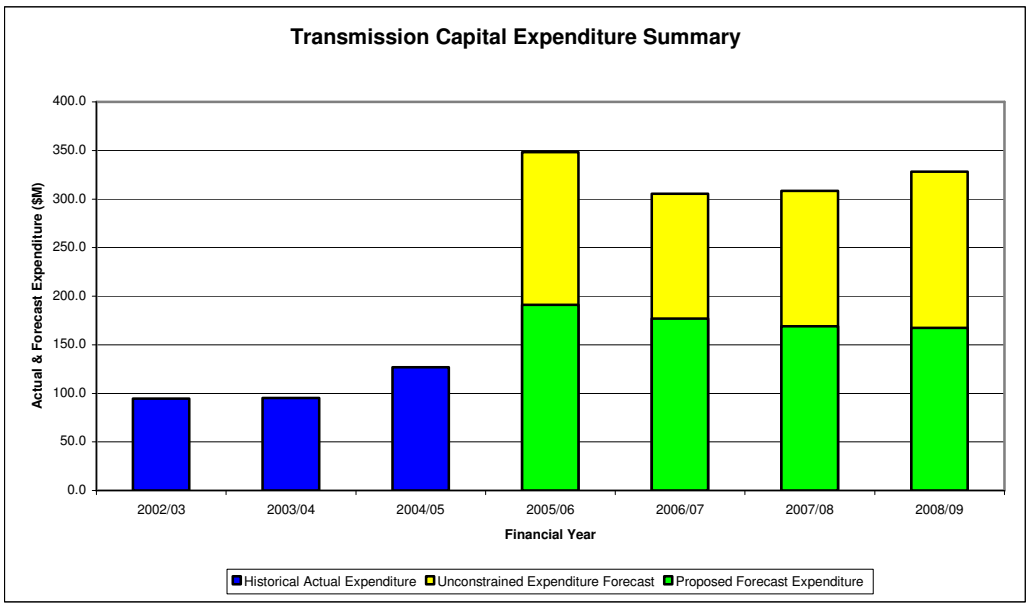
- an assessment of the current capacity of the external market, which is assessed to be capable of delivering up to $145 million per annum worth of capital works, and

- the reasonable assumption that the external market is committed to growing its capacity to meet Western Power's requirements.

In addition to resource constraints, Western Power must also take into account the financing and pricing constraints that impact on the aggregate level of capital expenditure. In particular, the proposed capital expenditure has been strictly limited to Government-approved SDP levels in 2005/06 and ramped up in subsequent years, commensurate with the assessed ability of industry to progressively increase its resource capability to undertake the higher expenditure levels.

The capital expenditure forecast presented in Figure 8 below shows the combined effect of the resource and financing constraints. Overall, the figure shows that in aggregate the capital expenditure proposals are substantially below the capital expenditure requirements determined in the pre-constrained analysis conducted by Western Power and PB Associates. Western Power's view is that the proposed expenditure reflects an appropriate balance between the unconstrained expenditure requirements of the network; the resource constraints that limit the achievement of increased expenditure without compromising efficiency considerations; and the financing and pricing considerations that must also be considered.

Figure 8 – Western Power's unconstrained and constrained transmission capital expenditure requirements (nominal dollars)



Inevitably, capital expenditure which is less than the unconstrained requirements of the network will lead to higher life-cycle costs and/or lower levels of service than would otherwise be the case. With this consideration in mind, Western Power must prioritise its expenditure in a manner that, firstly, ensures that the company complies with safety, environmental and other mandatory statutory requirements. Once these requirements have been satisfied, Western Power will further manage the expenditure constraints to minimise any adverse impact on customers (in terms of both reliability and total life cycle costs).

4.4 Western Power's capital expenditure proposals

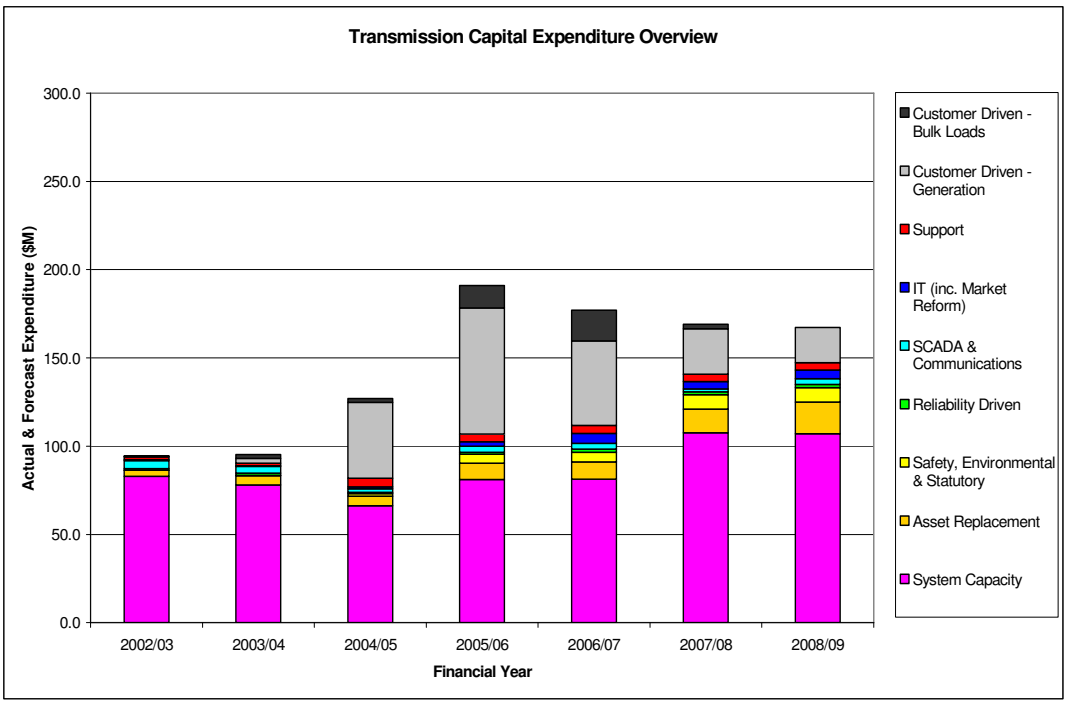
Table 6 below provides a summary of actual and forecast transmission capital expenditure, by category, for the period 2002/03 to 2008/09.

Table 6: Summary of Transmission Capital Expenditure (Nominal $M)

	Actual	*Actual*	*Actual*	*Forecast*	*Forecast*	*Forecast*	*Forecast*
	Historical			**Interim**	**First access arrangement period**		
	2002/03	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
System Capacity	83.0	78.0	66.2	81.2	81.2	107.5	107.0
Customer Driven - Bulk Loads	0.3	2.1	2.1	12.7	17.4	2.7	-
Customer Driven - Generation	0.3	2.9	42.9	71.6	47.9	25.7	20.1
Asset Replacement	3.3	5.2	5.5	9.1	9.9	13.5	18.0
Safety, Environmental & Statutory	0.1	0.2	1.5	5.1	5.4	8.1	8.1
Reliability Driven	0.9	1.3	0.7	1.2	1.8	1.8	1.8
SCADA & Communications	4.5	3.8	2.0	3.4	3.2	1.5	3.4
IT (inc. Market Reform)	0.5	0.4	1.2	2.6	5.8	4.2	4.8
Support	1.6	1.3	4.9	4.2	4.5	4.1	4.1
TRANSMISSION TOTAL	**94.5**	**95.2**	**126.9**	**191.0**	**177.1**	**169.1**	**167.3**

Figure 9 below provides a graphical representation of actual and forecast transmission capital expenditure, by category, for the period 2002/03 to 2008/09.

Figure 9: Summary of Transmission Capital Expenditure ($M in nominal terms)



5 Transmission operating and maintenance expenditure

5.1 Introduction

This section describes and substantiates the operating expenditure forecasts for the transmission network.

The operating expenditure requirements of the transmission network should achieve the following outcomes:

- satisfaction of future demand for Western Power's services, including new connection enquiries from generators and loads;
- alignment of asset management strategies with industry best practice;
- ensuring that benchmark service standards for the transmission network are achieved;
- ensuring compliance with health, safety and environmental obligations;
- minimization of total life-cycle costs by optimising operating and maintenance (O&M) and capital expenditures; and
- delivery of achievable and sustainable efficiency gains, in terms of improved performance, increased output and lower cost.

The remainder of this section is structured as follows:

- section 5.2 summarises the drivers for increased operating expenditure in the forthcoming access arrangement period;
- section 5.3 explains Western Power's approach to determining its operating expenditure for the forthcoming access arrangement period; and
- section 5.4 presents Western Power's transmission network operating expenditure proposals.

5.2 Drivers for increased operating expenditure

In a number of respects, the drivers for increased operating expenditure are similar to those identified in relation to capital expenditure. In particular, future transmission operating expenditure will be affected by:

- the impact of previous budget constraints;
- facilitation of market reform;
- facilitating the connection of additional generation capacity; and
- compliance with more onerous safety, health, and environment regulations.

In addition to these factors (which drive operating and capital costs), two cost drivers relating specifically to operating expenditure are:

- optimisation of maintenance expenditure; and

- insurance.

Each of these cost drivers are discussed in turn, but for more detailed discussion of the first four cost drivers listed above, please refer to section 4.2.

5.2.1 Impact of previous budget constraints

In recent years, Western Power's network business has operated within budget constraints that have required expenditure to be reduced below optimal levels. This has affected both capital and operating expenditure, and will have an impact on future operating expenditure.

To some extent, rectifying the backlog in replacement capital expenditure will reduce the pressure on operating expenditure. In particular, expenditure in relation to corrective emergency maintenance expenditure should reduce as asset failure rates decline. However, Western Power also needs to address a growing backlog in preventative routine maintenance in order to arrest the recent increase in failure rates (see section 5.2.2 of Part A of this submission for details).

It is noted that increases in preventative routine maintenance will have a number of positive impacts in terms of business performance. In particular, it will assist the transmission business in meeting its service benchmarks in relation to circuit availability and customer minutes off supply. In addition, preventative maintenance will assist the business in minimising the risk of non-compliance with its health, safety and environmental obligations.

The key preventative maintenance activities that will be enhanced in the forthcoming access arrangement period are summarised in Table 7 below.

Table 7: Key preventative activities for the transmission network

Substation Primary Plant Maintenance	This activity includes maintenance of switchgear, disconnectors, transformers and other associated transmission primary plant, in accordance with good electricity industry practice.
Line Patrol / Pole Top Inspection	These patrols are necessary to ensure that Western Power meets its regulatory requirements as well as reducing the potential risks of fire, outages or injury to staff and the public. These inspections help detect sagging or aged conductors or poor condition pole tops so that action can be taken prior to equipment failure. These inspections are likely to lead to additional follow-up work.
Substation HV Equipment Testing	This activity includes routine maintenance and electrical testing of CTs, VTs, CVTs, SAs and indoor switchboards in order to meet the defined asset mission criteria.
Line Washing / Insulator Silicone	This activity includes the washing of line insulators from elevated platform vehicles or helicopters. This activity covers the most critical transmission lines located close to the coast, to reduce the number of outage incidents due to salt build-up.
Line Easement Vegetation Maintenance	This program is intended to reduce exposure to bushfires and reduce the number and severity of system interruptions.

5.2.2 Facilitation of market reform

In relation to capital expenditure, the following market reform projects were noted as key cost drivers in the forthcoming regulatory period:

- **Standalone business systems** - Works include Internet, Intranet, MIMS, Financial modelling, Treasury, DMS, Messaging.

- **Networks Customer Information System** – Works involving replacement of current systems and processes with an off-the-shelf package that supports access billing, and provides the network business with capability to manage customers (retailers and non-energy customers) in a deregulated environment as an independent business unit.

- **Interface to the Interim Market & Transitional Provisions** – This involves an information access portal that provides information sourced from operational systems to meet the Interim Market & Transitional Provisions as at July 2006.

- **Metron** – This is a Metering Business System to enable the dissemination of metering data to the Western Australian Energy Market participants.

- **Compliance reporting** – Works include determining compliance reporting needs and the implementation.

Each of these projects will have an operating expense component, and therefore these cost drivers are equally relevant to future operating expenditure. A particular area where costs are likely to increase is in relation to compliance and regulatory reporting, as the new regulatory arrangements are implemented.

5.2.3 Facilitate the connection of additional generation capacity

As noted in section 3 above, Western Power expects a substantial increase in generation connections in the forthcoming regulatory period. As a result, Western Power will need to address an increased number of connection inquiries and connection agreements (operating expenditure) in addition to the physical connection of the generators (capital expenditure).

5.2.4 Compliance with safety, health, and environment regulations

It was noted in section 4 above, that the company must comply with more onerous safety, health, and environment regulations in the forthcoming regulatory period.

In relation to operating expenditure, the key compliance issues relate to the need for additional network inspections and associated follow-up maintenance work to meet prescribed maintenance standards. Bushfire mitigation programs also necessitate increased vegetation management activities. These operating expenditure are non-discretionary and cannot be deferred to later periods.

5.2.5 Optimisation of maintenance expenditure

In addition to the specific impact of budget constraints, Western Power also recognises that further work needs to be undertaken in order to optimise maintenance expenditure. The purpose of this optimisation is to better balance expenditure between operating and capital, but also to direct operating expenditure in an effort to minimise its total life-cycle costs.

To assist the company to optimise its future maintenance expenditure, Western Power intends to develop a more comprehensive maintenance strategy. Western Power believes that an increased focus on strategic asset management will enable the business to identify efficiency and network performance improvement opportunities that will ultimately lead to improvements in services for customers.

5.2.6 Insurance

Western Power's insurance costs have increased over the past 2 years, and are projected to escalate further over the forthcoming access arrangement period. Increases occurring in 2004 and 2005 reflect the difficult climate for utility insurances following 9/11 and the general tightening of policy availability and conditions. The continued increases reflect the expected industry trends for insurance premiums following careful analysis of the market.

Western Power is currently in the process of obtaining quotes for insurance coverage that relate specifically to the network business. Information obtained b the company during this process will provide a clearer indication of the levels of premiums for which the network business is responsible, and which are likely to apply following disaggregation of business segments. Nevertheless, the projected premiums are based on reasonable apportioning of costs between segments derived from claims histories and business risks.

5.3 Western Power's approach to determining transmission operating expenditure

In section 4.3, Western Power explained that its proposed capital expenditure has been constrained to take account of resource and financing limitations. The application of these constraints should provide greater assurance to stakeholders that the proposed expenditure is prudent, efficient, and in accordance with the requirements of the Code.

In relation to operating expenditure, Western Power has also sought to minimise the required increase in expenditure, recognising the cost drivers in the forthcoming regulatory period, the resource constraints and the need to provide customers with good value for money.

Taking all of these matters into account, Western Power believes it is appropriate for operating expenditure in the forthcoming regulatory period to be somewhat higher than historic levels and the SDP. However, Western Power does not believe that it would be appropriate to constrain transmission operating expenditure to the same extent as capital expenditure. Application of such constraints to operating expenditure would expose the company and its customers to excessive risk in terms of the long-term performance of the network. It is therefore essential that all reasonable endeavours are made to increase preventative maintenance to levels that are consistent with good electricity industry practice. It is also essential that the company has available to it sufficient resources to enable it to comply with all health, safety and environmental obligations within reasonable timeframes.

Although Western Power does not believe that it is appropriate to constrain operating expenditure unnecessarily, the company is nonetheless committed to delivering efficiency improvements. In particular, in aggregate, the network business believes that it can deliver operating expenditure efficiency gains of $10 million in 2005/06 and $20 million per annum in 2006/07 and 2007/08. These efficiency gains have been factored into the forecasts of efficient operating expenditure for the forthcoming

access arrangement period (set out in section 5.4 below). A substantial proportion of the savings are to be delivered by Western Power absorbing, within its forecasts of operating expenditure for the access arrangement period, the expected market-driven increases in labour and materials rates during that period.

5.4 Western Power's forecast transmission operating expenditure

Figure 10 below shows actual and forecast total operating and maintenance expenditure, by category, for the period 2002/03 to 2008/09.

Figure 10 - Transmission total operating and maintenance expenditure ($ million in nominal terms)

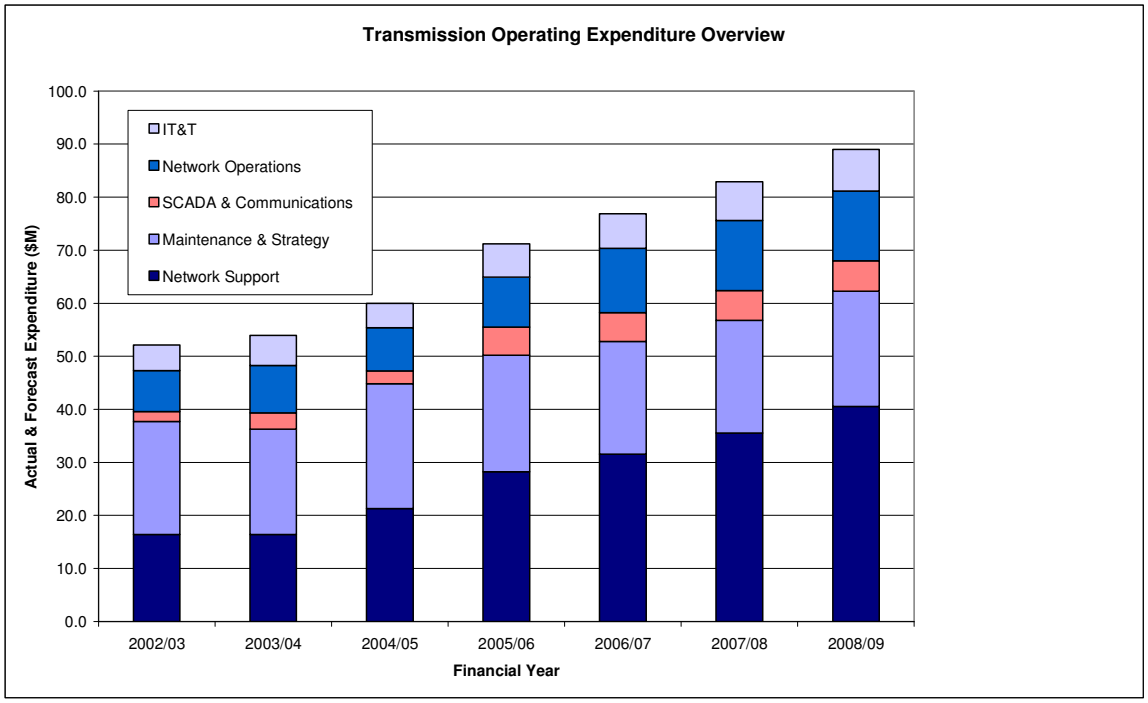


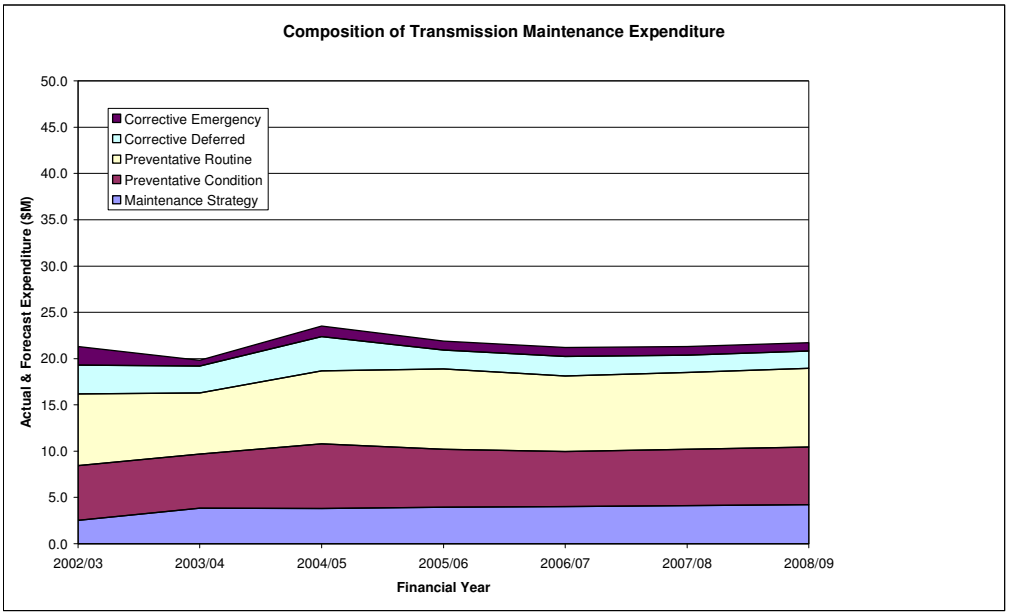
Table 8 below provides details of actual and forecast transmission maintenance expenditure over the period from 2003 to 2009.

Table 8 –Transmission maintenance expenditures (Nominal $M)[15]

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Preventative Routine	7.8	6.6	7.9	8.7	8.1	8.3	8.5
Preventative Condition	5.9	5.9	7.0	6.2	6.0	6.1	6.2
Corrective Deferred	3.1	2.9	3.7	2.0	2.1	1.9	1.9
Corrective Emergency	2.0	0.6	1.1	1.0	1.0	0.9	0.9
Maintenance/Strategy	2.5	3.8	3.8	3.9	4.0	4.1	4.2
Total Maintenance	21.3	19.8	23.5	21.9	21.2	21.3	21.7

Figure 11 below provides a graphical summary of the composition of transmission maintenance expenditures over the same period.

Figure 11 – Composition of proposed transmission maintenance expenditures (nominal dollars



[15] Note that these figures include street lighting maintenance.

6 Asset valuation and depreciation

6.1 Introduction

The calculation of Western Power's target revenue in the forthcoming access arrangement period requires an assessment of the value of the capital base[16]. The assets that comprise the capital base over the course of the first access arrangement period can be divided into two categories:

- assets employed at the access arrangement start date, which is scheduled to be 1 July 2006; and
- assets employed throughout the duration of the first access arrangement period, which is scheduled to be from 1 July 2006 to 30 June 2009.

The first category of assets is sometimes referred to as "sunk assets" because it consists of investments already undertaken at the access arrangement start date. Once the value of the assets in existence at the access arrangement start date is determined, the value of assets employed during the access arrangement period largely depends on the company's capital expenditure program[17], and regulatory depreciation[18].

This section presents the following information regarding asset valuation and regulatory depreciation:

- section 6.2 examines the Code provisions relating to the valuation and depreciation of Western Power's assets for the purpose of determining target revenue;
- section 6.3 describes Western Power's approach to establishing the value of the capital base as at 1 July 2006 (the proposed access arrangement start date) in light of the Code provisions;
- section 6.4 provides a description of the approach adopted to determine the depreciation charges that are applied to establish the capital base value and the target revenue for each year of the first access arrangement period;
- section 6.5 provides details of the calculations of the capital base value as at 1 July 2006, and for each subsequent year of the first access arrangement period;

6.2 Code provisions relating to the valuation of the capital base

Section 6.43 of the Code states that:

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16 The *capital base* is defined in the Code as the value of the network assets that are used to provide covered services on the covered network determined under sections 6.44 to 6.63. The capital base value is an input into the calculation of Western Power's target revenue, in accordance with section 6.4(a) of the Code.

17 Western Power's capital expenditure program is described in section 2, Part B (transmission) and section 2, Part C (distribution) of this submission.

18 In this context, the term "regulatory depreciation" means the depreciation charge adopted for the purpose of determining the company's target revenue and the value of its capital base. This measure of depreciation may differ from that disclosed in the company's statutory financial statements.

"The *capital-related costs* component of *approved total costs* for a covered network must be calculated by:

(a) determining a *capital base* under sections 6.44 to 6.63; and

(b) calculating a return on the *capital base* of the *covered network* by applying the w*eighted average cost of capital* calculated under section 6.64 to the *capital base*; and

(c) calculating the depreciation of the *capital base* under section 6.70."

The Code's definition *of capital-related costs* and *capital base* are as follows:

"capital-related costs in relation to *covered services* provided by a *service provider* by means of a *covered network* for a period of time, means:

(a) a return on the *capital base* of the *covered network*; and

(b) depreciation of the *capital base* of the *covered network.*"

"capital base for a *covered network* means the value of the network assets that are used to provide *covered services* on the *covered network* determined under sections 6.44 to 6.63."

Sections 6.46 and 6.47 of the Code specify the asset valuation methodology that is to be employed at the commencement of the access arrangement period as follows:

"6.46 For the start of the *first access arrangement period*, the *capital base* for a *covered network* must be determined using one of the following asset valuation methodologies:

(a) depreciated optimised replacement cost ("DORC"); or

(b) optimised deprival value ("ODV").

6.47 If under section 6.46 the *ODV* asset valuation methodology is used to determine the *capital base* at the start of the *first access arrangement period* for the *covered network* that is *covered* under section 3.1, the valuation must utilise, to the extent possible, any ministerial valuation under section 119 of the Act of the *network assets* which comprise the *covered network*."

For subsequent years of the access arrangement period, section 6.51 of the Code provides for forecast capital expenditure to be recognised in the calculation of target revenue, providing that the forecast expenditure is reasonably expected to meet the new facilities investment test, as follows:

"6.51 For the purposes of section 6.4(a)(i) and subject to section 6.49, the forward-looking and efficient costs of providing *covered services* may include costs in relation to *forecast new facilities investment* for the *access arrangement period* which is reasonably expected to meet the *new facilities investment test* when the *forecast new facilities investment* is forecast to be made."

Section 6.48 of the Code provides the Authority with considerable discretion as to how the capital base is to be determined at the start of subsequent access arrangement periods.

"6.48 For the start of each *access arrangement period* other than the *first access arrangement period,* the *capital base* for a *covered network* must be determined in a manner which is consistent with the *Code objective*."

Although section 6.48 of the Code provides discretion on how the capital base is determined in future, section 6.56 of the Code provides the following specific guidance in relation to capital contributions, as follows:

> "6.56 No amount may be added to the *capital base* in respect of any *new facilities investment* for which a *capital contribution* has been, or is to be, provided to the *service provider*."

Sections 6.61 to 6.63 enable the Authority to remove an amount from the capital base to take account of any redundant capital. Section 6.62 of the Code provides guidance to the Authority in terms of the approach that it must take in determining if any capital is redundant, whilst section 6.63 allows the Authority to take account of its decision in relation to redundant capital in making other determinations:

> "6.61 Subject to section 6.62, the *Authority* may in relation to a determination under section 6.44(a) require an amount ("redundant capital") to be removed from the *capital base* to the extent (if any) necessary to ensure that *network assets* which have ceased to contribute in any material way to the provision of *covered services* are not included in the *capital base*.
>
> 6.62 Before requiring a removal under section 6.61, the *Authority* must have regard to:
>
> (a) whether the *service provider* was *efficiently minimising costs* when it developed, constructed or acquired the *network assets*; and
>
> (b) the uncertainty such a removal may cause and the effect which any such uncertainty may have on the *service provider*, *users* and *applicants*; and
>
> (c) whether the cause of the *network assets* ceasing to contribute in any material way to the provision of *covered services* was the application of a *written law* or a *statutory instrument*; and
>
> (d) whether the *service provider* was compelled to develop, construct or acquire the *network assets*:
>
> (i) by an award by the *arbitrator*; or
>
> (ii) because of the application of a *written law* or a *statutory instrument*; and
>
> (e) whether the depreciation of the *network assets* should be accelerated instead of or in addition to a *redundant capital* amount being removed from the *capital base* under section 6.61.
>
> 6.63 If the *Authority* requires a removal under section 6.61, then when making other determinations under this Chapter 6 the *Authority* may have regard to the removal."

The Code provides limited guidance in relation to the regulatory depreciation that should be applied to the capital base. Section 6.70 places a requirement on the service provider to set out its approach in the access arrangement, as follows:

> "6.70 An *access arrangement* must provide for the depreciation of the *network assets* comprising the *capital base*, including the economic lives of each *network asset* or group of *network assets*, the depreciation method to be applied to each *network asset* or group of *network assets* and the circumstances in which the depreciation of a *network asset* may be accelerated."

6.3 Western Power's approach to establishing the capital base at 1 July 2006

In preparing this submission, Western Power carefully reviewed the Code provisions (set out above) that relate to the capital base. The company has also examined the approaches to asset valuation adopted by regulators in other jurisdictions. In the light of this analysis, Western Power's view is that, with the exception of the relatively high level of uncertainty regarding the valuation of the capital base across successive access arrangement periods the Code provisions employ an approach that is comparable to that adopted in other jurisdictions. This finding should provide interested parties with confidence that the Code provisions are soundly based and reasonably familiar to regulatory practitioners. In broad terms, the Code provisions require that:

- The target revenue properly reflects the capital-related costs of providing covered services.

- The capital-related costs comprise the return on capital (namely, WACC multiplied by the capital base value) plus the return of capital (namely, depreciation).

- The capital base value as at the commencement of the first access arrangement period must be set on the basis of a DORC or ODV valuation, and utilise any ministerial valuation made under section 119 of the Act.

- The Authority may remove assets or that part of an asset from the capital base that is considered to be redundant. However, the Authority must also consider whether the investment was prudent at the time it was undertaken, and the possible adverse consequences of removing redundant capital expenditure in terms of its impact on incentives to invest in the future.

- The capital-related costs for an access arrangement period may include forecast capital expenditure, providing that this is a prudent estimate.

- There should be no 'double-charging' in relation to assets whose initial construction costs are funded by capital contributions.

- The service provider must propose a reasonable approach with regard to the depreciation of the capital base (for the purpose of determining target revenue) over time.

As noted in further detail below, Western Power has prepared its assessment of the capital-related costs for the first access arrangement period in accordance with the above principles. However, Western Power has also had regard throughout the preparation of its access arrangement to the issue of price shocks. In particular, to ensure that customers do not face significant increases in prices (and having regard to section 6.4(c) of the Code), Western Power is proposing to include the future costs and revenues arising from capital contributions in its building block calculations. The effect of this treatment is neutral in revenue terms over a number of access arrangement periods, but has the desirable effect of reducing Western Power's revenue requirement in the forthcoming access arrangement period and thereby reducing price shocks.

A regulatory issue arises in relation to Western Power's proposed approach to capital contributions. This is because the proposed approach appears to conflict with the

strict wording of section 6.56 of the Code, even though the approach satisfies the underlying principle of ensuring there is no 'double-charging' in relation to assets whose initial construction costs are funded by capital contributions. The Authority and ERIU are aware of this issue and a Code change is likely to be sought if the Authority concludes that the proposed approach is inconsistent with the Code. In addressing the issue of Code compliance, Western Power would ask the Authority to note the requirements of section 6.4(c) and section 2.3(b)(ii) of the Code, which would tend to support Western Power's proposed approach.

Therefore, Western Power proposes that the initial capital base will be the optimized deprival value (ODV) of assets as at 30 June 2004 (determined in accordance with the independent valuation commissioned by the WA Government's Electricity Reform Implementation Unit (ERIU)) adjusted for inflation, depreciation and capital expenditure which occurred or is forecast to occur from 30 June 2004 to 1 July 2006. The capital base to which the WACC and depreciation apply is the total asset value less the accumulated value of the capital contributions.

The capital base from 1 July 2006 will be the gross value, which includes the value of capital contributions received by Western Power after that date. The capital base to which the WACC and depreciation apply is the total asset value less the accumulated value of the capital contributions received prior to July 2006.

In relation to the 30 June 2004 valuation, Western Power notes that page 5 of the ERIU valuation[19] report states that:

> "Following withdrawal of the Electricity Corporations Bill 2003, the primary purpose of this report is to provide a periodic valuation of the transmission and distribution networks for the purpose of determining network access prices."

On this basis, Western Power believes that the ERIU valuation provides a robust basis for the establishment of the capital base as at 1 July 2006 in accordance with the applicable Code provisions, and can be relied upon by the Authority. In this context it is noteworthy that page 6 of the ERIU valuation report states:

> "The valuation assessment in this report has been based upon what PricewaterhouseCoopers ("PwC") and Sinclair Knight Merz ("SKM") believe to be a robust, transparent and clearly defined approach to material issues using current regulatory and commercial valuation best practice. The valuation methodology adopted as agreed with the Valuation Committee established by the Electricity Reform Implementation Unit is set out at Appendix A of this report."

In "rolling-forward" the ERIU valuation for actual and forecast net additions since 30 June 2004 (to establish a capital base value as at 1 July 2006), Western Power recognises that the Code requires the resulting valuation to be based on an ODV or DORC methodology. As noted above, the ERIU valuation has been conducted on an ODV basis, so to meet the requirements of the Code, the net additions (relating to the period from 1 July 2004 to 30 June 2006) must also be consistent with an ODV approach.

Western Power is confident that the net additions between 1 July 2004 to 30 June 2006 reflect prudent and efficient levels of investment, and therefore are consistent with ODV principles. In particular, capital expenditure proposals are subject to internal investment approval and budgeting processes that ensure that only prudent

[19] Western Power Corporation, *Physical Assets Valuation as at 30 June 2004, Distribution and Transmission Networks: Report to the Valuation Committee*, June 2004.

capital expenditure is incurred. Furthermore, the company has been subject to capital budgeting constraints, which has resulted in capital being rationed so that only the highest value, most efficient investments have been undertaken.

Section 4 in Part B and section 3 of Part C of this submission provide further assurance regarding the prudency of Western Power's capital expenditure programme. These sections of this submission set out detailed information regarding the company's approach to ensuring that its capital expenditure satisfies the requirements of the new facilities investment test. These rigorous assessment processes apply to all expenditure that has been (or is forecast to be) undertaken over the period from 1 July 2004 to 30 June 2006, as well as capital expenditure that is expected to be undertaken over the first access arrangement period. Western Power notes that section 6.50(b) of the Code provides for forecast capital expenditure that is likely to meet the new facilities investment test to be included in the capital base.

In relation to redundant assets, Western Power notes that the ERIU valuation report described the valuation approach adopted as involving three main steps, as follows:

> "(1) establishing the MERA [modern equivalent replacement asset] of the gross service potential embodied in the existing assets; (2) adjusting the gross current replacement cost determined above for over-design, over-capacity and/or redundant assets; and (3) depreciating this value to reflect the anticipated effective working life of the asset from new, the age of the asset and the estimated residual value at the end of the existing asset's working life."[20]

On this basis, Western Power believes that the ERIU valuation has addressed the issue of asset redundancy with regard to assets as at 30 June 2004. In addition, it is Western Power's view that all capital expenditure undertaken since the ERIU valuation continues to be required to provide covered services. On this basis, there should be no requirement for any further allowance for redundant assets beyond that already provided for in the ERIU valuation of 30 June 2004.

The ERIU valuation includes an assessment and calculation of depreciation. The valuation also documents the assumed lives for each asset type. The asset lives utilised were consistent with other regulatory precedents. Generally, depreciation was calculated using a straight-line method, with a minimum remaining life assumed for all equipment of 5 years.

In the light of the above information, Western Power believes that the Code objectives would be best satisfied if the capital base as at 1 July 2006 is established by:

- accepting the ERIU valuation as at 30 June 2004 on the basis that it was conducted in accordance with the requirements of sections 6.46 and 6.61 of the Code; and

- rolling-forward the 30 June 2004 valuation to account for actual and forecast net additions, to establish a capital base value as at 1 July 2006, on the basis that the net additions over the period reflect prudent and efficient expenditure, and therefore meet the requirements of sections 6.46 and 6.61 of the Code.

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[20] Western Power Corporation, *Physical Assets Valuation as at 30 June 2004, Distribution and Transmission Networks: Report to the Valuation Committee*, June 2004, Appendix A, page (2)

Details of the calculation of the capital base value as at 1 July 2006 are set out in section 6.5 below. Section 6.4 provides a description of the approach adopted to determine the depreciation charges applied in the calculation of the capital base value as at 1 July 2006, and for each year of the first access arrangement period.

6.4 Western Power's approach to depreciation – transmission assets

Under the approach to calculating target revenue set out in Subchapter 6.2 of the Code[21], depreciation (as defined sections 6.43 and 6.70 of the Code) represents a return of accumulated capital to investors. In this sense, it is necessary to distinguish between the depreciation charge that is applied in the calculation of target revenue pursuant to Subchapter 6.2 of the Code, and the depreciation charge that may appear in the company's statutory financial accounts, or in its tax return.

Western Power's approach to determining the depreciation charge to be applied in the calculation of target revenue ("regulatory depreciation") for the first access arrangement period is to adopt a robust, independent assessment of the appropriate weighted average depreciation charge for the portfolio of assets that make up the capital base. As noted below, the 2004 ERIU valuation provides this information.

Two calculations involving depreciation[22] must be made for the purposes of establishing the capital base value and the target revenue for the first access arrangement period:

- The first calculation involves rolling-forward the 30 June 2004 asset value (established by the EIRU valuation) to account for net additions since that date, in order to determine a capital base value as at 1 July 2006.

- The second calculation involves rolling-forward the capital base value as at 1 July 2006 to account for forecast net new facilities investment and depreciation, to derive a forecast of the capital base value for each year of the first access arrangement period.

Western Power's asset accounting systems provide limited detailed data by asset category on the level of investment undertaken by the company. The depreciation element of the "roll-forward" calculation therefore uses the June 2004 ERIU valuation as a basis for determining the annual depreciation charge to be applied to:

- the assets in existence as at 30 June 2004; and

- the new assets added to the transmission business asset base over the period from 30 June 2004 to 1 July 2006.

Depreciation on the stock of assets over the period from 1 July 2004 to 30 June 2006 is calculated as follows:

- Depreciation on the assets in existence as at 30 June 2004 is calculated on a straight line basis using the asset lives identified in Appendix C-1 of the 2004 ERIU valuation.

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21 "Calculation of Service Provider's Costs".

22 Use of the term "depreciation" throughout this submission and in the access arrangement denotes "regulatory depreciation" as defined in this section of the submission.

- All capital expenditure undertaken since 30 June 2004 is assumed to have the same asset category composition as the entire network as at 30 June 2004. Applying this reasonable assumption allows a weighted average life to be imputed for the new assets added over the two year period from 30 June 2004. This, in turn enables an appropriate depreciation charge to be calculated in respect of new assets created over the period from 30 June 2004 to 1 July 2006, to calculate the capital base value as at 1 July 2006.

Once the capital base value as at 1 July 2006 is determined in this manner, the depreciation charges applied to determine the forecast capital base value for each year of the first access arrangement period are based on the application of a straight line depreciation model, and a weighted average asset life for the entire capital base which is consistent with the asset lives set out in Appendix C-1 of the 2004 ERIU valuation

6.5 Proposed capital base and depreciation values

As noted in section 6.3 above, Western Power has adopted an approach to valuing the capital base that utilises the 2004 ERIU asset valuation and rolls this forward for inflation, and net additions between 30 June 2004 and 1 July 2006. This section sets out details of the data and calculations applied to establish the capital base value over the period from 30 June 2004 to 30 June 2009.

The ODV valuation of the transmission capital base as at 30 June 2004 is summarised in Table 9 below.

Table 9: ODV valuation of transmission assets ($m) as at 30 June 2004[23]

ERIU ODV Valuation (Commissioned Circuits Only)	
Network – Substations	598.8
Network – Lines	476.2
Network – Metering	2.0
SCADA & Comms	31.3
Non-Network (ex land)	16.1
Land & Easement	66.5
Total ODV ($M)	1,190.9
Major Work in Progress as at 30 June 2004	
WLO - BSN 81 Line & Waterloo Sw/Yd	11.2
Rivervale S/S : 132kV Conversion	4.2
ST - EP 81 Conversion to Double Cct	6.0
ST - CT 330 kV Line & Sub Ends	2.4
MU-BTN 82 (part) : Construct 132kV Line	3.7
Total Major Work in Progress as at 30 June 2004	27.4
Total Transmission Network Value as at 30 June 2004	1218
Less Written Down Value of Capital Contributions	86
Capital Base value (excluding CapCons)	**1,132**

Based on the ODV value established by the 2004 ERIU valuation, and applying the approaches described in sections 6.3 and 6.4 above, the capital base value as at 30 June for each year over the five year period from 30 June 2004 has been calculated as shown in Table 10 below.

[23] Source: Western Power Corporation, *Physical Assets Valuation as at 30 June 2004, Distribution and Transmission Networks: Report to the Valuation Committee*, June 2004, page 49.

Table 10: Derivation of transmission *capital base* value ($m in nominal terms)

	Year ending 30 June					
	2004	**2005**	**2006**	**2007**	**2008**	**2009**
Year of first access arrangement period				**1**	**2**	**3**
Opening capital base value	-	1,132	1,213	1,369	1,528	1,677
plus Escalation	-	25	30	33	37	40
plus Capital Expenditure	-	99	173	177	169	167
less Depreciation	-	43	47	52	57	61
less Disposals	-	0	0	0	0	0
Closing capital base value	1,132	1,213	1,369	1,528	1,677	1,823

7 The cost of capital

7.1 Introduction

The weighted average cost of capital (WACC) is a critical determinant of the level of Western Power's capital-related costs. These capital-related costs, in turn, comprise a substantial proportion of the company's total costs, and hence its target revenue.

There is a significant degree of imprecision and subjectivity involved in the estimation of the WACC, and there is certainly no one objectively determinable "correct" estimate of the WACC. It is universally recognised however, that very large costs to society as a whole would arise over the long term if regulators set the WACC at a level that is insufficient to encourage adequate on-going investment in infrastructure over the long term.

This section of the submission describes the methods and assumptions applied by Western Power to estimate its WACC for the purpose of calculating the target revenue attributable to the SWIS[24]. This section is structured as follows:

- section 7.2 examines the Code provisions and other relevant regulatory instruments relating to WACC;
- section 7.3 broadly outlines Western Power's approach to estimating the WACC;
- section 7.4 examines the statutory framework under the Code that governs the Authority's decision making in relation to WACC;
- section 7.5 examines the key practical issues which arise when estimating WACC in a regulatory context;
- section 7.6 examines the costs and risks which arise if WACC is set at too low a level;
- section 7.7 details the approach adopted by Western Power's specialist advisers to quantify the estimation errors inherent in establishing the regulatory WACC;
- section 7.8 quantifies the plausible range for the regulatory WACC;
- section 7.9 outlines the approach applied, and considerations taken into account by Western Power to select a point estimate of the WACC from the plausible range; and
- section 7.10 sets out Western Power's conclusion on the WACC to be applied for the purpose of calculating the company's target revenue for the first access arrangement period.

[24] The methodology and assumptions described here are the same for Western Power's transmission and distribution networks that comprise the SWIS.

7.2 Code and other regulatory provisions relating to WACC

Section 6.65 of the Code states:

> "The *Authority* may from time to time make and *publish* a determination (which subject to section 6.68 has effect for all *covered networks* under this Code) of the preferred methodology for calculating the *weighted average cost of capital* in *access arrangements*."

On 25 February 2005, the Authority made and published a determination of the preferred WACC methodology to apply to networks which are covered under the Code.[25]

Section 6.64(a) of the Code states:

> "An *access arrangement* must set out the *weighted average cost of capital* for a *covered network*, which if a determination has effect under section 6.65:
>
> (i) for the *first access arrangement* for the *covered network* that is *covered* under section 3.1 - may use any methodology (which may be formulated without any reference to the determination under section 6.65) but, in determining whether the methodology used is consistent with this Chapter 6 and the *Code* objective, regard must be had to the determination under section 6.65; and
>
> (ii) otherwise - must use the methodology in the determination under section 6.65 unless the *service provider* can demonstrate that an *access arrangement* containing an alternative methodology would better achieve the objectives set out in section 6.4 and the *Code objective*."

Section 6.69 of the Code states:

> "For the *covered network* that is *covered* under section 3.1, a determination under section 6.65 has effect in relation to the *approval* of the *first access arrangement* if it is *published* at least 3 months before the *submission deadline*."

For the avoidance of doubt, paragraph 7 of the Authority's WACC determination states:

> "Pursuant to section 6.69 of the Access Code, this determination is effective for the first access arrangement submitted for Western Power Corporation's South West Interconnected Network (SWIN) within the South West Interconnected System."

Paragraph 5 of the WACC determination states:

> "The Authority's determination, pursuant to section 6.65 is that:
>
> - the capital asset pricing model (CAPM) be the methodology used for calculating the return on assets;
>
> - financial modelling be applied in real terms;

[25] A copy of the Authority's *Determination of a preferred WACC methodology for covered electricity networks* is available from the Authority's web site at: http://www.era.wa.gov.au/electricity/library/WACC_Methodology_Determination_23Feb05.pdf

- the weighted average cost of capital (WACC) be formulated on a pre-tax basis, using the Officer formula with the taxation adjustment calculated using a forward transformation;

- the debt premium be based on market evidence of debt costs for businesses with a credit risk profile consistent with a BBB or BBB+ credit rating (sources of relevant market evidence may include CBASpectrum and Bloomberg estimates of corporate bond yields);

- nominal risk free rates to be derived from Commonwealth 10 year bond rates with terms of 10 years, calculated on the basis of a 20 trading day average of the yields, taken at the final day of the month prior to a decision on an access arrangement;

- real risk free rates to be derived from a 20 trading day average of the yields on Commonwealth index-linked bonds with terms of 10 years, taken at the final day of the month prior to a decision on an access arrangement;

- the inflation forecast for the relevant period is the difference between the nominal risk free rate and real risk free rate (calculated using the Fisher equation); and

- an appropriate benchmark gearing assumption be adopted to encourage efficient financing decisions."

Importantly, paragraph 8 of the determination states:

> "It is noted that the figures in Appendix 1 to this determination do not represent a pre-determination of the WACC by the Authority, but are intended to represent a reasonable depiction of the cost of capital at the time of publication of this determination. Appendix 1 sets out the inputs into the WACC calculation considered by the Authority to be an effective means of achieving the objectives in sections 2.1 and 6.4 of the Access Code for the SWIN."

7.3 Western Power's approach to estimating the WACC

Western Power appointed KPMG and the Strategic Finance Group (SFG) to provide specialist assistance in estimating the WACC. The reports provided by KPMG and SFG form part of this access arrangement information, and are attached as Appendices 4 and 5, respectively.

KPMG's report sets out detailed analysis that identifies and describes the feasible or plausible range of values for each of the individual WACC parameters, namely:

- the real risk free rate;

- equity beta;

- market risk premium;

- capital structure;

- debt margin and cost of debt; and

- the value of imputation credits.

SFG then undertook an analysis which translated the plausible range of values for each WACC parameter into a point estimate of the WACC. To do this, SFG

developed and applied a simple framework based on well-accepted statistical procedures to quantify the statistical imprecision associated with estimating WACC parameter values and the WACC itself.

KPMG's report sets out the key results of SFG's analysis. That report also states that KPMG is of the view that the overall approach applied by Western Power in developing its point estimate of the WACC is consistent with the Authority's WACC determination made on 25 February 2005.

7.4 Framework for the Authority's decision making under the Code

In its report to Western Power, KPMG expresses concern regarding the Authority's interpretation of its obligations under the Code, and certain aspects of the Authority's approach to determining the WACC methodology.

As already noted, there is significant uncertainty and estimation error involved in determining a point estimate of the WACC. This necessarily leads to a need for reasonable judgement to be exercised when selecting a point estimate of WACC from a plausible range. In this context, it is worth noting that section 4.28 of the Code is a significant provision as it attempts to clarify the nature of the Authority's functions in carrying out its decision making process. The section provides that the Authority must determine whether a proposed access arrangement meets the Code objective and the requirements set out in chapter 5. If the Authority considers that the Code objective and the requirements set out in chapter 5 are satisfied, it must approve the proposed access arrangement.

Section 4.28(b) of the Code states:

> 'To avoid doubt, if the *Authority* considers that the *Code objective* and the requirements set out in chapter 5... are satisfied, it must not refuse to *approve* the *proposed access arrangement* on the ground that another form of *access arrangement* might better or more effectively satisfy the *Code objective* and the requirements set out in chapter 5...'

The note accompanying this provision in the Code states that the effect of section 4.28 is to make the Authority's decision in relation to a proposed access arrangement a 'pass or fail' assessment. The policy behind this provision is consistent with the reasoning of the Australian Competition Tribunal in the decision in Re: GasNet Australia (Operations) Ply Ltd [2003] A CompT 6 where it was found (in the context of equivalent provisions of the National Gas Access Code) that the Regulator was required to approve a proposed access arrangement if the proposed access arrangement falls within the range of choice reasonably consistent with the Code principles.

Notwithstanding the apparently clear terms of section 4.28, paragraph 27 of the Authority's WACC determination notes that section 2.1 of the Code requires the service provider's proposal to promote an economically efficient outcome, and that "this objective is not necessarily achieved by the service provider making proposals which fall within a [reasonably open] range of choice". In Western Power's view, the Authority's statement runs counter to the proper approach to be taken to assessing a proposed access arrangement as required by section 4.28.

7.5 Estimating WACC in a regulatory context

The discussion paper published by the Authority in January 2005 noted:

> "The cost of capital for an asset or activity is not unilaterally determined by the owner of the asset, the provider of the capital or, in the case of regulated utilities, by a regulator – it is a market price for investment funds [and is] dependent upon a supply and demand for capital funds. As with the market price for any good or service, the market price for capital cannot be calculated a priori, but is determined by transactions within the market. In judging what the cost of capital might be for a particular project, the best source of information is historical evidence on costs of capital for other, similar, projects and businesses."[26]

The Authority subsequently determined (pursuant to section 6.65 of the Code) that the capital asset pricing model (CAPM) shall be the methodology used for calculating the return on assets.

The practical application of the CAPM to estimate the cost of equity in a regulatory context must recognise the following important considerations:

- Whilst various tests of the CAPM have generally lent support to the broad concepts of risk that underpin the model, empirical testing has also shown that the CAPM does not fully explain security pricing and the cost of equity[27].

- There are significant information constraints, estimation challenges and uncertainties in applying the CAPM in practice. The potentially detrimental impacts of these challenges and methodological limitations are magnified in a regulatory context, where a substantial proportion of revenues and profitability is dependent on the Authority's estimate of WACC.

- In theory, a number of parameters underpinning the CAPM should reflect forward-looking estimates, which are unobservable in practice.

In Western Power's view, the most significant practical consideration arising in the application of the CAPM is that estimating the cost of capital necessarily involves a very significant degree of uncertainty. This practical reality has been recognised by the Productivity Commission in its final report on its review of the gas access regime, as follows:[28]

> "While the debt costs of a service provider are relatively straightforward to assess, the return required by equity investors is not. The return on equity is typically estimated using the capital asset pricing model (CAPM). This method depends on the measurement of two contentious variables — a service provider's 'beta' (a measure of its risk relative to that of the total market for risky investments) and the market risk premium…

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26 Allen Consulting Group, *Advance Determination of a WACC Methodology: Report to Economic Regulation Authority*, January 2005, pages 7 and 9.

27 See, for instance, Richard Roll (1997) "A critique of the asset pricing theory's test", *Journal of Financial Economics, 4*. The Roll critique also highlights the difficulties of testing the theory. Similarly, in its May 2004 *Gas Control Inquiry Draft Report*, the New Zealand Commerce Commission stated: "The Commission acknowledges that a number of the assumptions underlying the CAPM violate real world conditions".

28 Productivity Commission (2004) *Review of the Gas Access Regime*, Report no. 31, Canberra. pages 297, 299, 302.

> Implementing the WACC/CAPM approach is not a precise science, given the numerous debatable assumptions involved. There is even disagreement on the precise formulas to use, due to different views on how issues such as tax should be treated. Hence, a range of plausible values can be generated for the regulatory rate of return using the WACC/CAPM approach…
>
> This debate highlights the fact that regulatory rates of return are set on the basis of many assumptions. Such assumptions are used because regulation is applied in a world of uncertainty...
>
> There is disagreement among technical experts about how regulatory rates of return (WACC) in Australia compare to those in other countries. This illustrates the inevitable imprecision and subjectivity that occurs when regulators are required to approve reference tariffs…"
>
> Given that the CAPM is a theoretical model based on debatable assumptions, the Commission is concerned that the model has become a de facto requirement under the regime. This situation might have been facilitated by s.8.31 of the Gas Code, which describes the CAPM as a 'well accepted financial model'. The comments of the leading financial experts quoted by Allgas Energy would suggest otherwise. The Commission considers that it needs to be made more explicit that there is no single correct method to calculate a rate of return and there can be a range of plausible values used in applying a method. It is recommended that s.8.31 be reworded to reflect this."

SFG's report to Western Power describes and analyses in some detail the practical limitations of using CAPM in a regulatory setting. For instance, page 10 of the SFG report states:

> "It is safe to say that the CAPM does not provide any degree of comfort in being able to state precisely and without reservation what the cost of equity actually is. Confidence intervals around the estimated cost of equity are extremely wide. Furthermore, firm specific estimates would have even greater uncertainty than the industry results that are reported. The merits of the asset pricing approach to cost of equity estimation are perhaps best summed up by Fama and French (1997) themselves:
>
> > '…uncertainty of this magnitude about risk premiums, coupled with the uncertainty about risk loadings [betas], implies woefully imprecise estimates of the cost of equity'."

Given the challenges involved in the application of theoretical asset pricing models such as the CAPM, the paucity and uncertainty of the available data, and the impact that the Authority's WACC determination will have on incentives for on-going investment, it is clear that:

- a considerable amount of careful judgment - based on robust analysis - is required in developing a point estimate of the WACC; and
- the WACC must be set at a level that takes due account of the estimation error involved, and minimises the risk of damaging investment incentives.

Before examining how the estimation error can be taken into account (in section 7.7 of this Part of the submission), section 7.6 below examines the significant potential

costs that may arise in the event that estimation error leads to the adoption by the Authority of a regulated WACC that is below the true cost of capital.[29]

7.6 Costs and risks involved in setting WACC at too low a level

The Authority will be well aware that one of the major themes of the Productivity Commission's recent review of the national access arrangements was the risk of "regulatory error", and the realisation that the potential costs associated with too little infrastructure investment are far greater than those associated with too much investment. The Productivity Commission found that there is asymmetry in the consequences of regulatory errors:

> "Given that precision is not possible, access arrangements should encourage regulators to lean more towards facilitating investment than short term consumption of services when setting terms and conditions …
>
> [and] given the asymmetry in the costs of under- and over-compensation of facility owners, together with the informational uncertainties facing regulators, there is a strong in principle case to 'err' on the side of investors".

It is in this vein that the Productivity Commission provided a clear warning against an excessive focus on the removal of so-called "monopoly rents" from the revenue streams of facility owners, quoting a submission to the review by National Economics Consulting Group Pty Ltd (NECG), which stated:

> "In using their discretion, regulators effectively face a choice between (i) erring on the side of lower access prices and seeking to ensure they remove any potential for monopoly rents and the consequent allocative inefficiencies from the system; or (ii) allowing higher access prices so as to ensure that sufficient incentives for efficient investment are retained, with the consequent productive and dynamic efficiencies such investment engenders.
>
> There are strong economic reasons in many regulated industries to place particular emphasis on ensuring the incentives are maintained for efficient investment and for continued productivity increases. The dynamic and productive efficiency costs associated with distorted incentives and with slower growth in productivity are almost always likely to outweigh any allocative efficiency losses associated with above-cost pricing. (sub. 39, p. 16)"

Given these important considerations, the Productivity Commission's review of the national access regime made 33 recommendations to improve the operation of the regime. The review identified as a "threshold issue":

> "… the need for the application of the regime to give proper regard to investment issues…[and] the need to provide appropriate incentives for investment".[30]

The Productivity Commission's views were supported by the Australian Government's response, which signalled the Government's intention to make changes to the Trade Practices Act which "endorse the thrust" of the Productivity Commission's recommendations.[31] In particular, the Government will modify the

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29 The notion of the distinction between the true cost of capital and the regulatory WACC is explored in further detail in section 7.7 below.

30 Productivity Commission (2001), *Review of the National Access Regime: Inquiry Report 28*, page xxii.

31 Commonwealth Government (2002), *Government Response to Productivity Commission Report on the Review of the National Access Regime: Interim Response*, page 1.

regime to require the ACCC to have regard to pricing principles, which specify that regulated access prices should:

- be set so as to generate expected revenue for a regulated service or services that is at least sufficient to meet the efficient costs of providing access to the regulated service or services;

- include a return on investment commensurate with the regulatory and commercial risks involved.

It is noteworthy that these requirements are broadly reflected in section 6.4(a)(i) of the Code, which sets out the objectives of price control in an access arrangement.

The Productivity Commission's 2004 review of the gas access regime also recommended the adoption of an objects clause and pricing principles that are essentially the same as those proposed by the Australian Government for the national access regime. In relation to the issue of regulatory error, regulatory risk and WACC, the Productivity Commission stated:[32]

> "The Commission also considers that there is a potential for *regulatory error* under the regime due to the complex issues involved in determining a reference tariff, including the need to make a subjective judgment about the risk faced by a service provider… In addition, recent appeal decisions suggest that regulators err towards imposing lower returns…
>
> … There is also uncertainty about the values of various parameters a regulator might apply in approving reference tariffs (such as the weighted average cost of capital)…"

The method prescribed in section 6.2(a) of the Code for determining Western Power's target revenue for the purpose of establishing its price control for the first access arrangement period necessarily requires that a point estimate of the WACC be applied. As already noted, the WACC is probably the single most important and uncertain variable in the calculation of Western Power's target revenue. In view of these considerations, the point estimate of the WACC used to determine Western Power's price control must take into account:

- the potential cost of getting it "wrong" (as described in the Productivity Commission's recent reviews);

- the uncertainties associated with estimating the WACC and its constituent parameters; and

- the need to ensure that in practice, investors are adequately remunerated for all risks involved in the provision of infrastructure (including the regulatory and commercial risks, as required by the Government's proposed modifications to the national access regime).

With these considerations in mind, Western Power engaged SFG to undertake a robust analysis aimed at quantifying the estimation error involved in establishing the regulatory WACC. The approach applied by SFG in its analysis, and the key conclusions of that analysis are discussed in detail below.

[32] Productivity Commission (2004), *Review of the Gas Access Regime*, Report no. 31, page xxx.

7.7 Quantifying estimation error in regulatory WACC

SFG's report to Western Power explains that in a regulatory setting, the regulator seeks to estimate the true cost of capital. In this context, it is important to note that the regulator cannot observe or measure or compute the true cost of capital, nor does the regulator know the firm's true cost of capital. The regulator can only estimate it. This is because the true cost of capital is a forward-looking expectation or required return and is simply not observable. Importantly therefore, the allowed return (or "regulatory WACC") is likely to be different from the true cost of capital.

SFG's report cites evidence demonstrating that generally:

- regulators are well aware of the distinction between the firm's true cost of capital, and the regulator's estimate of this; and
- regulators recognise that their estimates of WACC are statistically imprecise.

The SFG report then proceeds to:

- identify the sources of uncertainty in estimating WACC parameters;
- quantify the uncertainty around the estimation of each WACC parameter;
- demonstrate how uncertainty around each parameter aggregates into uncertainty about the true cost of capital of an efficiently financed firm, and quantify the uncertainty around the estimated WACC; and
- develop and apply a framework for determining an appropriate regulatory WACC in light of estimation uncertainty.

The key conclusions of SFG's analysis are as follows:

- There is significant uncertainty and estimation error involved when estimating a firm's cost of capital. This uncertainty has been clearly and systematically documented in authoritative studies (such as those undertaken by Fama and French, for instance), the results of which are examined in some detail in the SFG report. The source of this uncertainty is that WACC parameters cannot be estimated with great precision.
- A firm's WACC is estimated, not computed. The true cost of capital of an efficiently financed firm may be higher or lower than this estimate.
- It is particularly important in a regulatory setting to not just recognise the existence of uncertainty and estimation error, but also to quantify it as precisely as is reasonably possible. That is, it is important to quantify the probability that the true cost of capital is higher or lower than the estimated WACC, and by how much.

7.8 Quantification of the plausible range for WACC

Based on its analysis, KPMG concludes that the WACC for Western Power's network should be set by reference to values that fall within a specified plausible range for each of the underlying parameters, as set out in Table 11 below.

Table 11: Pre-tax real WACC parameter estimates

Parameter	Basis of estimate	Plausible range	
		Low	High
Real risk free rate *	Yield on 10 year Government indexed bond (20 day average)	2.69%	2.69%
Equity beta	Comparables and regulatory decisions	0.90	1.10
Market risk premium	Historical stock returns and 10 year government yields; Regulatory decisions	6.0%	8.0%
Capital structure (equity to total value)	Comparables and regulatory decisions	40%	40%
Debt margin *	BBB and BBB+ spreads from CBA Spectrum, and other allowances	1.49%	1.68%
Value of imputation credits	Empirical evidence and regulatory decisions	50%	0%
** Estimate will be subject to change to reflect prevailing interest rates at the time of Authority's final authorisation*			

SFG has applied parameter values drawn from the plausible ranges identified by KPMG to construct a full probability distribution of the WACC estimate using standard Monte Carlo simulation techniques. Table 12 below lists the assumptions applied by SFG regarding the probability distributions of each of the parameter values.

Table 12: Assumptions adopted in SFG's Monte Carlo simulation

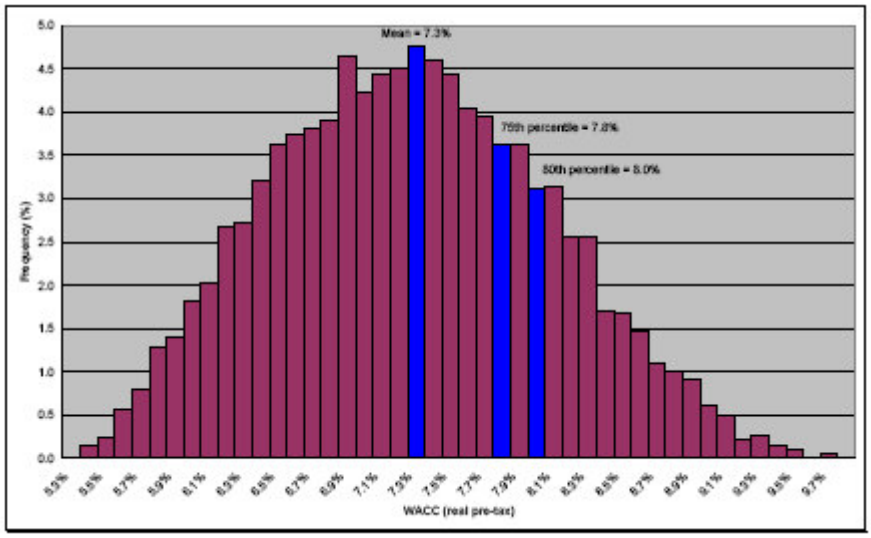
Parameter	Estimate of value	Probability Distribution
Real risk free rate	2.69%	None
Equity beta	0.9 – 1.1	Uniform
Market risk premium	Mean = 6% Standard deviation = 1.8%	Normal
Capital structure	60%	None
Debt margin	1.49% – 1.68%	Uniform[33]
Value of franking credits	0.0 – 0.5	Uniform

Applying the assumptions set out in Table 12, SFG took a random draw from the distribution for each uncertain parameter, and computed the resulting pre-tax real

[33] A uniform distribution indicates that the parameter value has an equal probability of being at any point within the range indicated.

WACC. This process was repeated 10,000 times, yielding a histogram of WACC estimates, which is shown in Figure 12 below.

Figure 12: Distribution of pre-tax real WACC estimates for 10,000 simulations



This probability distribution of the pre-tax real WACC has the following characteristics:

- a mean value of 7.3%;
- a standard deviation of 0.8%;
- a 90% chance the true value falls between 6.0% and 8.6%;
- a 75th percentile value of 7.8%; and
- an 80th percentile value of 8.0%.

In interpreting the output of this analysis, the SFG report notes:

> "The fact that a number of input parameters cannot be estimated precisely but can only be narrowed to a reasonable range, inevitably means that it is impossible to express the WACC estimate (which is a mathematical aggregation of the input parameters) as a single point estimate. The estimated WACC must be expressed as a reasonable range. The width of this range depends on the aggregated uncertainty of the imprecisely estimated input parameters."

Pages 17 to 19 of the SFG report set out further explanatory material to provide guidance regarding the interpretation of the WACC probability distribution.

7.9 Considerations relevant to selecting a point estimate of the WACC

The approach developed by SFG provides the Authority with a useful aid to decision-making: the ability to explicitly measure the probability that a particular regulatory WACC will be insufficient to meet the cost of capital of an efficiently financed firm.

The SFG report notes:

> "This information will be useful to the regulator in setting an allowed return to balance (i) whether the costs paid by consumers are higher than they need to be, with (ii) whether the returns earned are sufficient to ensure the viability of the regulated entity and provide the appropriate incentives for future investment. Clearly, a key piece of information to be considered by the regulator when assessing these competing objectives is the probability that the allowed WACC will be insufficient to meet the true cost of funds. This, of course, is directly related to the ongoing viability of the business and to the incentives for future investment.
>
> This non-recovery probability would be set at 50% if these two considerations were ranked equally. But they are not. Setting the non-recovery probability at 20-25% for example, would reflect the fact that it is more important to ensure the viability of the business than to ensure that customers pay the minimum possible cost…
>
> Quantifying the probability that the assigned regulatory WACC is sufficient to meet the true cost of funds is central to the implementation of the objectives of regulation. For example, a regulatory WACC that provides a 75% chance of meeting the true cost of funds is likely to be sufficient to provide a sustainable commercial revenue stream, [in accordance, for instance, with the requirements implied by the Australian Government's response to the Productivity Commission's report on the national access regime] but a WACC that provides only a 25% chance does not…
>
> Indeed, the Authority is required to exercise its judgment to achieve an appropriate balance between the interests of all stakeholders. The proposed approach provides a framework for quantifying exactly this trade-off - if prices (and returns) are to be lowered, how (quantitatively) will this impact the ability of the firm to meet its cost of funds and provide adequate returns to its investors?"

SFG notes that the New Zealand Commerce Commission (NZCC) has recently recognised the uncertainty and statistical imprecision in its regulatory WACC estimates in a formal probabilistic manner.[34] Rather than producing a single point estimate, the NZCC constructs a probability distribution for the WACC and recognises that the firm's true cost of funds could come from anywhere within that distribution. The NZCC also notes the asymmetric consequences of regulatory error – that the costs of setting the regulatory WACC too low are much more severe than the costs of setting it too high. For this reason, the NZCC adopts the 75th percentile from the probability distribution as the appropriate regulatory WACC estimate. This reflects the statistical uncertainty of its WACC estimate and the balancing of the risks of regulatory error.

SFG's report concludes by suggesting that the regulatory WACC should be set so that there is a 75% to 80% chance that it will be sufficient to cover the true cost of funds of the regulated entity. The basis of this conclusion is summarised in the following excerpt from the SFG report:

[34] New Zealand Commerce Commission, *Gas Control Enquiry: Final Report*, 29 November 2004, www.med.govt.nz/ers/gas/control-inquiry/final-report/final-report.pdf.

> "Setting a 75-80% probability of being able to earn a return sufficient to cover the true cost of funds is consistent with the notion that ensuring the ongoing viability of the business and creating the right incentives for future investment is more important than keeping prices to a minimum, a view that is supported by the Productivity Commission. Note that if consumer prices and business viability are weighted equally, there is a 50% chance that the WACC will be insufficient to cover the entity's cost of funds."

After examining the lessons from the Productivity Commission's recent reviews of access regimes in Australia (summarised in section 7.5 above), SFG states:

> "We argue that the views [expressed by the Productivity Commission regarding the need for regulatory decision-making to focus on providing incentives for more rather than less investment] are consistent with the notion that the regulatory WACC should be set so that there is a better than even chance of the entity recovering its cost of funds."

Western Power strongly concurs with the specialist advice provided by KPMG and, in particular, the conclusions of SFG's analysis, which collectively provide a compelling case for an estimated real pre-tax WACC in the range of 7.8 to 8.0%.

7.10 Conclusion: Western Power's proposed WACC

Notwithstanding the case for applying a real pre-tax in the range WACC of 7.8 to 8.0%, Western Power recognises the need for pragmatism to be applied in selecting a point estimate of the WACC, having regard, in particular to:

- the need to moderate anticipated price increases at the commencement of the new access arrangement (in comparison to those that would be associated with a WACC of 7.8% to 8.0%);
- policymakers' expectations regarding the outcomes of electricity industry reform in Western Australia;
- the need to ensure that Western Power remains a financially viable business; and
- the views expressed previously by the Authority on the issue of WACC.

In relation to this last point, it is particularly noteworthy that in a submission to the Infrastructure Task Force[35] the Authority stated:

> "It would be pertinent to note the Authority's recent draft decision on the proposed access arrangement for the Dampier to Bunbury Natural Gas Pipeline, in which the Authority has approved the rate of return proposed by the pipeline operator. The parameter estimates within the proposed rate of return are consistent with the previous decisions of the Authority and other State and National regulatory bodies regarding rates of return, which accords with the Authority's previously expressed views regarding current regulatory rates of return being consistent with the legitimate business interests of service providers. This example also demonstrates how an efficient and timely approvals process can be achieved when infrastructure owners have reasonable expectations and submit suitable proposals in the first instance (rather than pursuing ambit claims which have the potential delay the process)."

[35] Letter from the Chairman of the Economic Regulation Authority to the Chairman of the Infrastructure Taskforce, 16 May 2005. Copy available at: http://www.era.wa.gov.au/library/Follow-up_submission_to_Taskforce_16May05.pdf

Having regard to all of the foregoing considerations, Western Power proposes to apply a real pre-tax WACC of 7.3% for the purpose of determining its target revenue for the first access arrangement period[36]. Applying a forecast CPI of 2.6% for the forthcoming regulatory period, the real pre-tax WACC equates to a nominal pre-tax WACC of 10.1%.[37]

In putting forward this proposal, Western Power wishes to emphasise that:

- the company has submitted a WACC proposal, in the first instance, which is consistent with reasonable expectations, and which is therefore not an ambit claim (and, indeed, is less than the range considered reasonable pursuant to the analysis by KPMG & SFG);

- the company shares the Authority's desire to ensure that the approval process is not unduly delayed by time consuming debate over the proper range for the WACC.

As discussed in section 2.1 (of Part A) and 7.4 (of this Part B), section 4.28 of the Code requires the Authority to approve a proposed access arrangement if its proposed components fall within the range of choice reasonably consistent with the Code objective and the requirements set out in chapter 5. Having regard to the report from KPMG, the proposed WACC of 7.3% is clearly within (or less than) the reasonable range of complying values and should therefore be acceptable to the Authority. Alternatively, if the Authority considers it necessary to adopt a particular point estimate from within the reasonable range, the SFG report indicates that the proposed rate of 7.3% is consistent with (or less than) a reasonable point estimate for these purposes.

Furthermore, it is reasonable to argue that the uncertainty associated with the impending re-structuring of Western Power Corporation, coupled with a price control arrangement that treats capital contributions as revenue (foreshadowed in section 6 of this Part B) will lead to an increase in the volatility of costs and revenues, and therefore return on assets. This may, in turn lead to an increase in systematic risk borne by equity providers and additional credit risk to the providers of debt.

It is further noted that treating capital contributions as regulated revenue has the effect of markedly decreasing the company's cash flow in the initial years of the new regulatory regime, and increasing cash flows in later years. The alternative cash flow streams would be the same in present value terms. Given the newness of the regulatory regime, however, delaying the return of capital to investors may expose Western Power to increased asset stranding risk. This observation implies that the cost of capital may be higher under the proposed approach to capital contributions.

Given the issues of restructuring and capital contributions, Western Power strongly believes that its proposed WACC of 7.3% is towards the lower end of the plausible range of WACC estimates.

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36 This proposal is based on the financial parameters in the KPMG report, including the 20 day average 10 year bond rate of 2.69%, which prevailed at the time of preparing that report. It is proposed that the risk free rate and WACC applied in the approved access arrangement will be based on a 20 day average bond rate applicable at a time (to be determined) just prior to the Authority's final approval of the access arrangement.

37 The nominal pre-tax WACC is used in the K factor in the price control. It is also used to calculate the return on capital on non-network assets which form part of the capital base, and which are valued at historic cost.

As demonstrated in the foregoing discussion and in Appendices 4 and 5, Western Power's proposal:

- takes account of pragmatic considerations such as the price path for network services in the immediate term, policymakers' expectations, and views already expressed by the Authority;

- takes proper account of the now widely accepted view (espoused by the Productivity Commission and other authoritative stakeholders) that the total costs to society of setting the regulatory WACC too low are much more severe than the costs of setting it too high; and

- is based on a thorough and robust analysis of the statistical uncertainty associated with establishing a point estimate of the WACC.

Application of the proposed WACC would facilitate the achievement of the Code objective set out in section 2.1 of the Code. In particular, the proposed WACC will promote economically efficient investment in, and operation of and use of Western Power's covered networks. Application of the proposed WACC is also consistent with the price control objective set out in section 6.4 of the Code, which requires amongst other things, that Western Power be given an opportunity to earn a level of target revenue for the access arrangement period that meets the forward-looking and efficient costs of providing covered services, including a return on investment commensurate with the commercial risks involved.

8 Total Revenue Requirement

8.1 Introduction

Section 6.2(a) of the Code states that:

> "Without limiting the forms of *price control* that may be adopted, *price control* may set *target revenue* by reference to the *service provider's approved total costs*."

Furthermore, in respect of the first access arrangement period, section 6.3 of the Code requires that the first access arrangement must contain the form of control described in section 6.2(a).

The earlier sections of this Part B provide a detailed explanation of Western Power's cost forecasts for the transmission network. Together, these cost forecasts comprise the approved total costs for the transmission network, for the purpose of determining target revenue. This approach to determining the annual revenue requirement of a regulated company is often referred to as the "building block" approach.

The purpose of this section of the submission is to explain how the cost elements discussed in the earlier sections of this Part B are combined to determine the target revenue in each year of the first access arrangement period. A similar calculation is explained in section 7, Part C of this submission in relation to the distribution network.

The remainder of this section is structured as follows:

- section 8.2 provides an overview of the building block method for determining the target revenue for the transmission network;
- section 8.3 provides details of the composition of the target revenue, including figures showing the trend of transmission revenue and average prices from 2002 to the end of the first access arrangement period;
- section 8.4 notes the reasons why the revenue that Western Power is permitted to collect under its price control may differ from the target revenue.

8.2 Overview of "Building Block" Revenue Determination Method

The revenue requirements are calculated as the sum of a series of "building blocks" which are summarised in Table 13, below. As already noted, the earlier sections of this Part of the submission provide detailed analysis of each building block element.

Table 13 – Summary of the building block components of target revenue

Target revenue component	Brief description	Cross-references for further details
Operations and maintenance costs	This is Western Power's annual cost of operating the transmission network, and maintaining the assets used in the delivery of covered services.	Section 4, Part B
Return of capital	This is the annual depreciation charge on the transmission assets used in the delivery of covered services.	Section 5, Part B
Return on capital	This is the product of the required rate of return (the weighted average cost of capital, or WACC) and the capital base. (The capital base for a covered network means the value of the network assets that are used to provide covered services on the covered network determined under sections 6.44 to 6.63 of the Code.) The capital base value over the access arrangement period is, in turn, a function of the depreciated value of assets at the start of the period, the level of annual depreciation recovered during the period, and the level of efficient new capital expenditure (new facilities investment) that is assumed to be required over the course of the access arrangement period.	Sections 5 and 6, Part B
Taxation	The pre-tax approach to WACC provides an allowance for company tax in the WACC.	Section 6, Part B

8.3 Forecast target revenue for the transmission network

Table 14 below shows the forecast capital-related costs for the transmission business for each year of the first access arrangement period. As noted above, these capital related costs form part of the target revenue for the transmission network.

Table 14: Capital-related costs in nominal terms: transmission

Revenue Component	Year ending 30 June		
	2007	2008	2009
Network Opening Capital Base ($M)	1,254.4	1,396.3	1,531.3
Network Capital Expenditure ($M)	157.2	150.9	155.9
WACC	7.3%	7.3%	7.3%
Return on Network Capital Base ($M)	**99.6**	**110.0**	**120.3**
Non-Network Opening capital base ($M)	114.7	131.4	145.6
Non-Network Capital expenditure ($M)	19.9	18.2	11.4
$WACC_{nom}$	10.1%	10.1%	10.1%
Return on Non-Network Capital Base ($M)	**12.5**	**14.1**	**15.2**
Working Capital ($M)	8.8	14.5	18.0
Return on Working Capital ($M)	**0.9**	**1.5**	**1.8**
Total Return on capital base ($M)	**113.1**	**125.6**	**137.4**

Table 15 below shows Western Power's forecast for each building block component of the target revenue, together with the target revenue for the transmission business (being the sum of the building block components) for each year of the forthcoming access arrangement period. The table also shows the tariff revenue for the transmission business.

Table 15: Components of total annual revenue requirement for transmission in nominal dollars ($M)

Revenue Component	Year ending 30 June		
	2007	2008	2009
Operating Costs ($M)	76.9	82.9	89.0
Regulatory Depreciation ($M)	56.2	61.4	67.1
Return on Capital ($M)	113.1	125.6	137.4
Revenue Smoothing Adjustment ($M)	8.5	-0.2	-10.1
Target Revenue (Smoothed in $M)	**254.6**	**269.8**	**283.4**
Deduct Capital Contribution Revenue ($M)	20.8	22.5	22.5
Tariff Revenue for Transmission Business ($M)	**233.8**	**247.3**	**260.9**

Figures 13 and 14 show the trend in transmission tariff revenues and average transmission tariff prices in nominal dollars for the year ending 30 June 2002 to the end of the first access arrangement period.

Figure 13: Trend in Transmission Tariff Revenue in Nominal Dollars

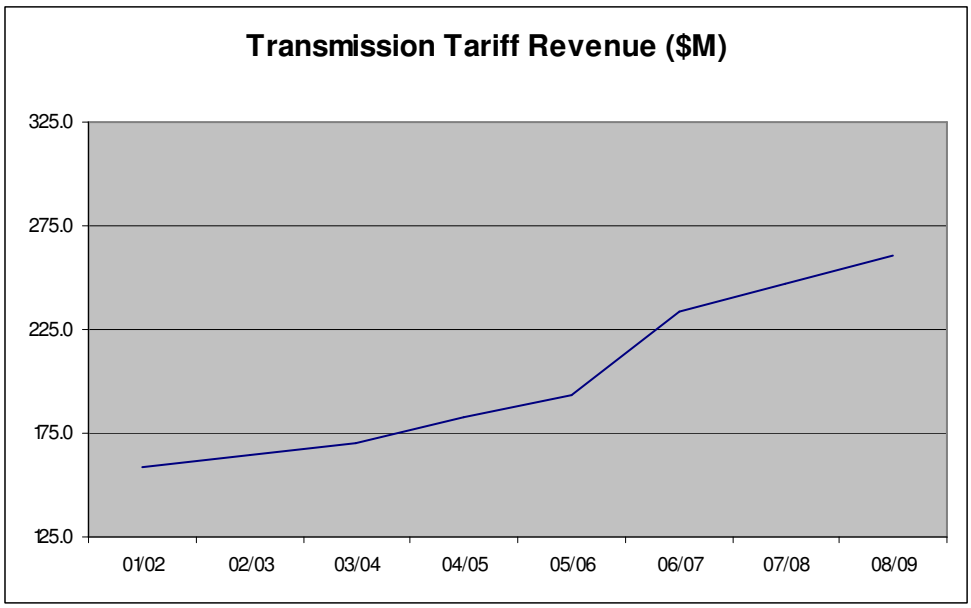
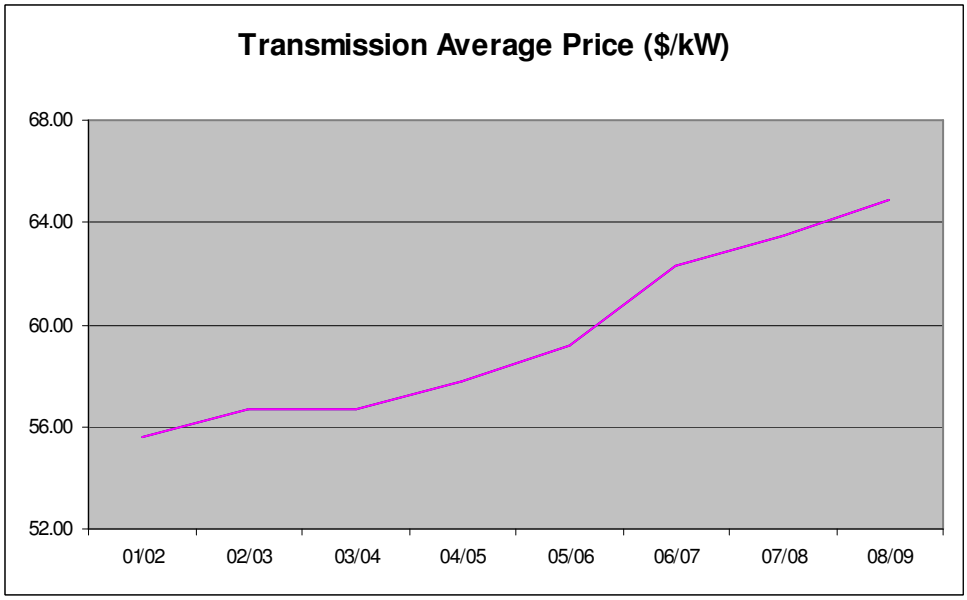


Figure 14: Trend in Transmission Average Price in Nominal Dollars



8.4 Relationship between actual revenue and target revenue

The target revenue determined from the forecasts of approved total costs represents the summation of the various revenue "building blocks", for a given set of assumptions. The target revenue values, along with the energy forecasts for the access arrangement period are used in the calculation of the price control that is to apply for the access arrangement period.[38]

[38] As noted in section 3, Part D of this submission, Western Power proposes to apply a revenue yield form of price control for the first access arrangement period. An explanation of the

The price control formula specifies the maximum revenue in each year (per unit of actual energy delivered by Western Power) that the company is permitted to collect from users of covered services.

As noted in section 4, Part D of this submission, the price control includes various mechanisms that may permit Western Power to recover certain unforeseen costs that may arise during the access arrangement period. Moreover, the actual revenue collected by the company will be a function of actual, rather than forecast energy volumes. For these reasons, the maximum revenue that the company is permitted to collect each year under the price control may differ from the target revenue.

Further details of the price control arrangements are provided in the Access Arrangement.

calculations applied to establish the X factor in the transmission price control is provided in Appendix 7 of the Access Arrangement.

PART C: DISTRIBUTION BUSINESS EXPENDITURE PLANS AND TOTAL REVENUE

1 Introduction to Part C

This Part of the submission provides detailed information to explain and substantiate the expenditure plans and total revenue requirements of the distribution business.

The key underlying cost drivers of the distribution business are:

- the standards or quality of services and other outputs which Western Power plans to deliver over the forthcoming access arrangement period; and

- the quantity of the services to be delivered over the period.

The development of robust expenditure programs must be based on a comprehensive consideration of these two fundamental cost drivers. Accordingly, the expenditure forecasts set out in this Part C reflect:

- the key distribution business outputs, in terms of planned distribution service standards, and other outcomes such as compliance with mandatory health and safety standards, environmental standards and technical standards, as summarised in section 5 of Part A; and

- the demand forecasts set out in section 2 below, which, among other things, are key determinants of the expected quantity of services that the company is planning to provide.

Once the underlying cost drivers have been defined and described in this manner, section 3 of this Part C proceeds to describe and substantiate the capital expenditure forecasts for the distribution business. The remainder of this Part C is then structured as follows;

- section 4 describes and substantiates the operating and maintenance expenditure forecasts;

- section 5 provides explanatory information relating to the asset valuation and depreciation costs;

- section 6 sets out the company's estimate of the cost of capital for the distribution business; and

- section 7 calculates and describes the total revenue requirement of the distribution business.

2 Distribution system energy forecasts

2.1 Introduction

This section provides an overview of the distribution system energy forecasts for the access arrangement period. In relation to the distribution network, energy forecasts play an important role in:

- establishing forecast network development capital expenditure; and
- setting the company's proposed price control formulae.

It was noted in relation to the transmission system that Western Power commissioned NIEIR to review the company's forecasts for energy and demand for the SWIS, for each year of the forthcoming access arrangement (2006-07 to 2008-09 inclusive). For further information in relation to Western Power's demand forecast methodology and NIEIR's review, please refer to section 2 of Part B of this submission.

This section, together with section 2, Part B, is intended to satisfy section 4.3(d) of the Code, which requires that the access arrangement information must include information detailing and supporting the service provider's system capacity and volume assumptions. The remainder of this section is structured as follows:

- section 2.2 provides an overview of Western Power's forecasting methodology for distribution energy forecast;
- section 2.3 presents the distribution system energy forecasts;
- section 2.4 summarises NIEIR's review of Western Power's forecasts; and
- section 2.5 provides some concluding comments.

2.2 Western Power's forecasting methodology for distribution energy

The first step in Western Power's methodology for forecasting distribution energy is to determine the actual sales for total distribution energy based on the most recent available data. Total distribution energy sales are defined as:

Total distribution energy = Western Power Retail sales

+ Third Party Retail sales

- Direct transmission sales

Third Party Retail sales represent around 13 per cent of total distribution energy. Sales to direct transmission customers are removed from retail sales because these customers are not connected to the distribution system.

The second step in Western Power's forecasting methodology is to 'roll forward' the latest available actual total distribution energy sales to forecast sales in the forthcoming access arrangement period. In essence, the forecasts of distribution energy to 2008-09 were developed by growing the total distribution energy with the same growth rate as the medium sent out energy forecast contained in the 2004 Generation Status Review (GSR 2004, Appendix C, Table C.1, pp. 47).

2.3 Western Power's distribution system energy forecasts

Western Power's distribution energy sales forecast are summarised in table 4.1 below (reproduced from page 13 of the NIEIR report). These forecasts have been developed using the forecast methodology described in section 2.2 above.

Table 4.1 Forecast distribution energy sales (GWh)

Financial year	Forecast sales
2004-05	11,591
2005-06	11,971
2006-07	12,410
2007-08	12,867
2008-09	13,200

2.4 NIEIR's review of Western Power's distribution forecasts

NIEIR has reviewed Western Power's distribution energy forecasts, and found that the forecasts are consistent with the 2004 GSR in the sense they use the same projected energy growth. For further details of NIEIR's comments, interested parties should refer to the NIEIR report.

In Western Power's view, the consistency of the distribution energy forecast with the published GSR forecasts should provide interested parties with confidence that the energy forecasts are robust and fit for purpose.

2.5 Concluding comments

This section has explained:

- Western Power's methodology for forecasting distribution system energy over the forthcoming regulatory period;
- Western Power's forecasts for distribution system energy; and
- NIEIR's comments on Western Power's methodology and proposed forecasts.

Western Power's view is that the information presented demonstrates that the distribution energy forecasts are robust and fit for purpose.

Updated distribution energy forecasts are expected to become available during the Access Arrangement review period. In particular, the Independent Market Operator recently published its "Statement of Opportunities, South West Interconnected System, July 2005" document. However, to date, Western Power has been unable to reconcile its distribution energy forecasts with those of the IMO .

In any event, it is planned to use the most up-to-date forecasts available during the latter stages of the Authority's Access Arrangement review process as the basis for final revenue and price setting prior to the final approval stage.

3 Distribution capital expenditure

3.1 Introduction

This section describes and substantiates the capital expenditure forecasts for the distribution network.

The capital expenditure requirements of the distribution network should achieve the following outcomes:

- network asset condition and service performance should comply with all relevant legislation and regulations;
- service performance should also meet customers' expectations in terms of reliability and quality of supply;
- new customer connections should be provided in a timely manner;
- assets must be renewed to ensure that service performance is not compromised in the medium term; and
- the life-cycle costs of providing distribution services should be minimised by appropriately balancing operating and capital expenditure.

In addition, it is essential that expenditure plans are feasible given the availability of internal and external resources, and the need to ensure that expenditure is executed efficiently. Furthermore, the resulting prices to Western Power's customers must be acceptable – taking into account the competing demands for better service and the desire to minimise price increases where practicable.

In relation to transmission capital expenditure (which is described in section 4 of Part B of this submission), Western Power noted a number of important cost drivers in the forthcoming access arrangement period that suggest that capital expenditure will need to increase. It was also noted that the need for increased capital expenditure as a result of these drivers must be tempered by resource, financing and pricing constraints.

A similar set of challenges arise in relation to the capital expenditure needs of the distribution network. The remainder of this section is structured in a similar manner to the section on transmission capital expenditure, and where appropriate references to that earlier section are noted.

- section 3.2 summarises the drivers for increased expenditure in the forthcoming access arrangement period;
- section 3.3 explains how Western Power has constrained its capital expenditure proposals to ensure that the plans can be delivered efficiently and to ensure that financing and pricing considerations are also properly addressed; and
- section 3.4 presents Western Power's distribution network capital expenditure proposals.

3.2 Drivers for increased distribution capital expenditure

In relation to distribution network capital expenditure, there are six principal drivers that lead to a need to increase expenditure from historic levels. These are:

- the impact of previous budget constraints;
- facilitation of market reform;
- load growth and review of design standards;
- reliability;
- asset condition; and
- safety, environment and statutory compliance obligations.

The first two drivers relate to both the transmission and distribution networks, and have already been discussed in relation to the transmission network capital expenditure (refer to sections 4.2.1 and 4.2.2 of Part B of this submission). Whilst the precise detail of their impact on each network is different, the general observations regarding their impact on future costs is the same for each network. Therefore, the focus of the discussion in this section is the remaining four principal distribution-specific drivers for increased capital expenditure. Each of these four remaining drivers is discussed in turn.

3.2.1 Load growth and review of design standards

Western Power currently designs and constructs a large proportion of the connection assets for new residential, industrial and commercial customers. Connection assets constructed by external contractors are "gifted" to Western Power and are not included in this category.

As a result of Western Australia's unprecedented high levels of population growth and the high levels of load growth generated primarily by new air conditioning load (including its deleterious effect on load factor) Western Power has a substantial amount of new distribution assets to construct and commission now and over the course of the forthcoming access arrangement period. In addition there is a substantial amount of augmentation work required on existing distribution feeders, as well as zone substation integration to cater for the additional load. This augmentation work includes a substantial amount of backbone feeder conductor replacement to improve both capacity and fault level rating.

3.2.2 Reliability

As noted in section 4 of Part A of this submission, Western Power's assessment is that customers expect, and should receive an improvement in reliability performance from recent historic levels. In particular, Western Power is committed to delivering a 25% improvement in SAIDI performance for urban and rural customers across the SWIS over the next 4 years. This service performance improvement has implications primarily for distribution operating expenditure (discussed in section 4 of this Part C below) but it also has some implications for distribution capital expenditure.

It is noted that some distribution capital expenditure that primarily caters for increased load growth or increased fault levels also has an impact on network

performance. The contributions made by these works to meeting the target reduction in SAIDI and SAIFI have been acknowledged and identified. In addition, two specific capital expenditure projects have been identified which can provide cost-effective contributions to achieving the SAIDI target:

- Distribution Automation Strategies; and
- Worst Performing Feeder Program.

In relation to Distribution Automation Strategies, the objective of the project is to introduce smart mechanisms and remote control methodologies for the prompt identification of faulted network sections, and rapid supply restoration to un-faulted sections. A pilot project will be commissioned, followed by a Distribution Automation Rollout. The project will considerably enhance Western Power's ability to respond to faults quickly, thus minimising average outage duration, particularly for those customers connected to sections of a feeder not affected by a fault.

In relation to the Worst Performing Feeder Program, the objective is to substantially improve the SWIS SAIDI by identifying and implementing technical solutions for the 40 worst performing feeders. The work will include activities such as targeted siliconing, bird-proofing, fitting tightening, surge arrestor installation, spreader installation, line patrol, line thermographic surveys, spreader/spacer installation, vegetation control, and other similar measures. In addition the work will include targeted conductor replacement, including undergrounding and the use of covered conductors as appropriate. This program will target the worst 20 Metropolitan, worst 10 North Country and the worst 10 South Country feeders. The cost is expected to be $15.7 million per year, which should deliver a 49 minute improvement in SAIDI over 4 years.

3.2.3 Asset condition

In order to determine a soundly-based forecast of distribution infrastructure investment required, Western Power engaged PB Associates to develop an age, condition and risk based replacement model. This model has been populated with Western Power's distribution asset data and the replacement capital expenditures determined by the model have been used as the basis of the projected expenditures for asset replacement for the forthcoming access arrangement period.

The model has been used to predict distribution asset replacement expenditures over the regulatory period, as well as the weighted average remaining life of these assets. The model has indicated that Western Power's distribution assets have a weighted average remaining life of 55% in 2005.

The model incorporates the current backlog of assets identified for replacement in the MIMS data base and has predicted total asset replacement expenditures over the regulatory period of approximately $145 million. The model has also predicted that these levels of investment will not arrest the decline in weighted average asset age, with the weighted average remaining life decreasing from 54% to 52% over the regulatory period.

Replacement capital expenditure of the level predicted by the model would represent a very substantial increase compared to historic levels of expenditure. This observation indicates that the current level of expenditure is almost certainly unsustainably low in the medium term. The challenge facing Western Power is to propose a reasonable approach for ramping up replacement capital expenditure

towards its long-term sustainable level, given the inevitable resource and financing constraints that apply.

3.2.4 Safety, environment and statutory requirements

This cost driver relates to Western Power's compliance with directives and remedial actions agreed with the Energy Safety Directorate (ESD), and compliance with statutes, acts, regulations and standards, in particular the Electricity (Supply Standards & System Safety) Regulations 2001.

Some of the remedial actions agreed with the ESD have been instigated in accordance with recommendations made by the State Coroner and others have been instigated by Western Power to minimise safety and environmental risks in accordance with good industry practice. All the projects included in this category directly relate to the achievement of mandated safety, environmental, and compliance outcomes or industry accepted good practice employed to prudently manage risk and avoid adverse outcomes. In this sense, the proposed expenditure is not discretionary.

The expenditure requirements necessary for Western Power to comply with its safety, environmental and statutory obligations are very substantial. The unconstrained capital expenditure is estimated to be approximately $54 million per annum. In view of this substantial level of expenditure, it is helpful to provide some details of the remedial actions that are considered necessary in the forthcoming access arrangement period. The principal items of capital expenditure are described briefly in Table 16 below.

Table 16: Principal capital expenditure items: Distribution network

Overhead service wires with twisties	The recent double fatality in Wyndham prompted a capital replacement program to replace services with twisty connections. Western Power has decided to replace all existing PVC services with Cross Linked Polyethylene insulated service cable terminated with approved wedge type clamps.
Conductive metal streetlight poles	A number of electric streetlight shock incidents have been experienced by members of the public from contact with metal streetlight structures. These incidents seem to have been due to inadequate earthing and/or deterioration or damage of insulation through abrasion inside the metal streetlight arm or luminare thereby energizing the metal structure. There are approximately 60,000 existing metal streetlight poles in the SWIS which will be inspected and where necessary maintained.
Distribution conductive power poles step and touch potential mitigation	This risk was highlighted during the investigation of the suspected electrocution of a dog in Derby and 3 potentially fatal electric shocks to members of the public in the Perth metropolitan area. An estimated 51,000 poles in the SWIS are at special or frequented locations that need to meet the ESAA C(b))1 limits for touch and step potential.
Streetlight switch wires	There have been 2 fatalities in the last 10 years and 2 potentially fatal electric shock incidents in the past 4 years to the public from fallen streetlight wires.
URD cable pits	There are 5711 below-ground cable pits with insulated piercing connectors (IPCs) used to supply power mainly to residential customers which have been installed in the SWIS as part of the Retrospective Underground Power program. A number of electric shock incidents have been reported by the public and Western Power Network employees resulting from such installations. A program to replace these URD cable pits with above ground pillars has commenced and up until March 2005 approximately 25% of these pits had been replaced in accordance with the solution agreed with the ESD.
Henley cable boxes	There has been a number of Henley cable box explosive failures in public areas resulting in shrapnel (metal) spread over a wide area. Such failures could have serious consequences, especially in high traffic areas (e.g. shopping centre car parks) where there is a high risk of injury to the public or damage the vehicles. There are an estimated 2,000 Henley cable boxes, which need to be replaced based on site location and traffic with the more critical known sites being resolved first.
Pole top switch (PTS) earthing mats	Five years ago a Western Power Network operator received a near fatal electric shock. Temporary measures have been taken until a permanent solution is implemented. About 3,000 pole-top switches in the metro area have ineffective earthing mats and so pose a significant risk of injury to switching operators.

Live-frame shrouding	Many of the LV frames in district substations have exposed bare live copper busbars. This has been recognised as hazardous to personnel accessing the site and must be rectified so as to protect switching operators and substation inspectors from risk of electrocution.
Wrapped copper LV neutral service connections	There have been a number of potentially fatal electric shock incidents directly attributed to faulty wrapped neutral connections. They are usually caused by open circuit or high resistance overhead neutral connections. It is estimated that about 200,000 connections need to be bypassed or replaced.
Inadequate reinforcing of transformer poles	Recently a transformer pole with limited reinforcement fell over into the middle of a suburban street. Western Power has engaged GHD to re-evaluate the strength of its pole top substation structures and GHD has indicated that these structures need to be reinforced by installing additional ground line reinforcements. It is estimated that around 3,000 poles may not be suitable for carrying the weight of 50 kVA or larger transformers, and need to be refurbished.
Padmount transformer noise	This project consists of the construction of noise barriers around padmount substation transformers to reduce noise emissions so that they comply with the requirements of the Environmental Protection (Noise) Regulations. The program of noise mitigation work is to be completed at 26 substations over a 4-year period which is expected to conclude by the end of 2008.
Bushfire mitigation	This project has been instigated as a result of a desire of both the West Australian Government and Western Power to reduce the potential for loss of life and/or property as a result of bush fires initiated by either the transmission or distribution network infrastructure.

3.3 Western Power's approach to constraining capital expenditure

In Section 3.2, six principal drivers for increases in distribution network capital expenditure were identified, and four drivers were discussed in detail. As noted in relation to capital expenditure for the transmission network (refer to section 4.3 of Part B of this submission), with the assistance of PB Associates Western Power has undertaken a detailed and comprehensive assessment of its capital and operating expenditure necessary to deliver all the required performance outcomes (safety, new customer connections, reliability, prudent asset management, etc.). The expenditure report (attached to this submission at Appendix 7) details Western Power's expenditure needs, taking account of resource constraints but assuming no financing or pricing constraints.

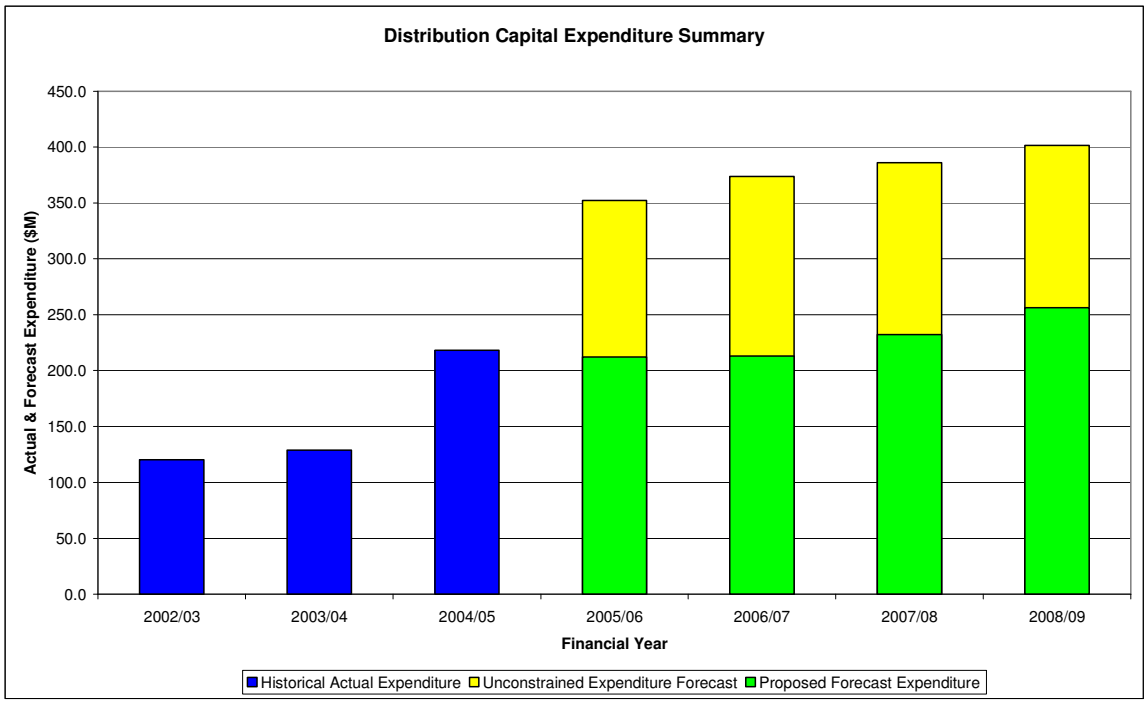
In relation to both the transmission and distribution networks, the pre-constrained capital expenditure assessment shows a significant increase in requirements compared to historic levels of investment. The challenge facing the network business is to balance the increased capital expenditure requirements against the inevitable resource and financing constraints that must also be addressed.

In section 4.3 of Part B of this submission, Western Power has explained the strategies that it intends to implement to increase its capacity to complete additional capital works without comprising efficiency. In addition, the company must take

account of the financial constraints that apply, as well as customers' expectations with regard to future network prices.

Western Power therefore proposes expenditure levels that are substantially below the level implied by the unconstrained capital expenditure projections, which have been developed from business drivers and validated by PB Associates. The distribution capital expenditure presented in figure 15 below shows the combined effect of the resource and financing constraints.

Figure 15 – Western Power's unconstrained and constrained distribution capital expenditure requirements in nominal dollars



As noted in relation to the transmission network, capital expenditure which is less than the unconstrained requirements of the network will lead to higher life-cycle costs and/or lower levels of service than would otherwise be the case. In this context, prioritisation of its expenditure must, firstly, focus on ensuring that Western Power complies with all safety, environmental and statutory obligations. These obligations alone warrant the substantial increase in distribution capital expenditure sought by Western Power. It is noted that the proposed expenditure in relation to asset replacement will result in an on-going backlog of works, with some implications for the medium term reliability of service. Nevertheless, given the resource, financing and customer-pricing constraints faced by Western Power, the proposed level of capital expenditure is considered to represent a reasonable balancing of all of these considerations.

3.4 Western Power's capital expenditure proposals

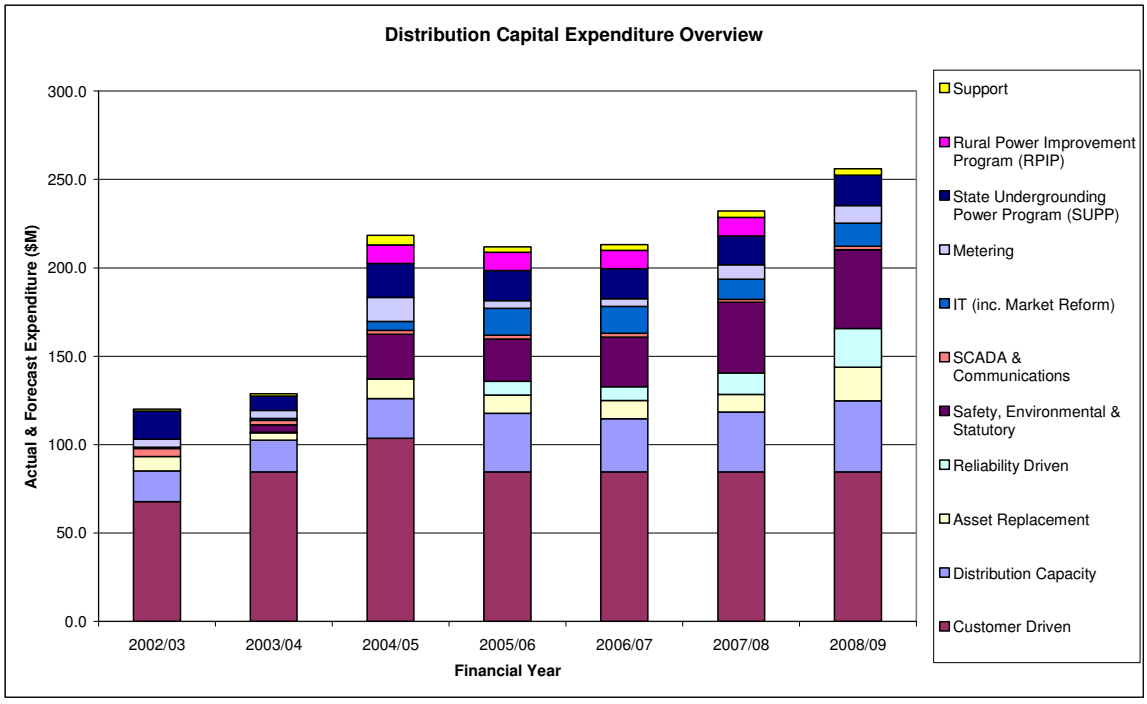
Table 17 below sets out a summary of actual and forecast distribution capital expenditure, by category, for the period 2002/03 to 2008/09.

Table 17: Summary of Distribution Capital Expenditure ($M in nominal terms)

	Actual	*Actual*	*Actual*	*Forecast*	*Forecast*	*Forecast*	*Forecast*
	Historical		**Interim**		**First access arrangement Period**		
	2002/03	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Distribution Capacity	17.3	18.1	22.5	33.3	30.2	34.0	40.3
Customer Driven	67.8	84.6	103.7	84.5	84.5	84.5	84.5
Asset Replacement	8.2	4.0	11.0	10.3	10.3	10.0	19.0
Reliability Driven	0.0	0.3	0.1	7.7	7.7	12.0	21.9
Safety, Environmental & Statutory	0.0	4.3	25.1	23.9	28.2	40.0	44.7
SCADA & Communications	4.5	2.5	2.2	2.1	2.1	1.8	1.9
IT (inc. Market Reform)	0.7	1.1	5.2	15.2	15.2	11.4	13.0
Metering	4.5	4.5	13.6	4.4	4.4	8.1	10.0
State Undergrounding Power Program (SUPP)	16.0	8.2	19.3	17.1	17.1	16.3	17.1
Rural Power Improvement Program (RPIP)	-	0.0	10.4	10.3	10.3	10.6	0
Support	1.2	1.3	5.4	3.2	3.2	3.5	3.8
DISTRIBUTION TOTAL	$120.2	$128.8	$218.4	$212.0	$213.1	$232.1	$256.2
Vested Assets	9.0	13.8	16.2	17.2	19.6	21.9	24.3
DISTRIBUTION GRAND TOTAL	129.2	142.6	234.5	229.2	232.7	254.0	280.5

Figure 16 below shows a graphical representation of actual and forecast distribution capital expenditure, by category, for the period 2002/03 to 2008/09.

Figure 16: Summary of Distribution Capital Expenditure ($M in nominal terms)



4 Distribution operating and maintenance expenditure

4.1 Introduction

This section describes and substantiates the operating expenditure forecasts for the distribution network. The distribution operating expenditure requirements of the distribution network should achieve the following outcomes:

- satisfying future demand for Western Power's services, including new customer connections;
- aligning asset management strategies with industry best practice;
- ensuring that benchmark service standards for the distribution network are achieved;
- ensuring that Western Power complies with health, safety and environmental obligations;
- facilitating the minimisation of total life-cycle costs by optimising operations and maintenance (O&M) and capital expenditures; and
- delivering achievable and sustainable efficiency gains, in terms of improved performance, increased output and lower cost.

The remainder of this section is structured as follows:

- section 4.2 summarises the drivers for increased operating expenditure in the forthcoming access arrangement period;
- section 4.3 explains Western Power's approach to determining its operating expenditure for the forthcoming access arrangement period; and
- section 4.4 presents Western Power's distribution network operating expenditure proposals.

4.2 Drivers for increased distribution operating expenditure

In relation to distribution operating expenditure, Western Power has identified ten principal drivers for increases in the forthcoming access arrangement period:

1. **Impacts of previous budget constraints** – leading to an unsustainable level of maintenance backlog.
2. **Compliance with health, safety and environmental obligations** – particularly relating to the need for additional network inspections and associated follow-up maintenance work to meet prescribed maintenance standards.
3. **Reliability** – additional expenditure to meet Western Power's service standard benchmarks in relation to SAIDI. Network maintenance programs have been developed to facilitate the achievement of the significant reductions in interruptions required to meet the proposed reliability targets.
4. **Whole of life efficiencies** - improved preventative maintenance programs have been introduced to achieve an optimal balance between maintenance and capital expenditure. These programs are expected to allow Western Power to extend

the operational lives of some assets whilst minimising service interruptions and corrective maintenance costs, thus leading to a reduction in overall lifecycle costs.

5. **Increasing Asset Base** - additional operating expenditure will arise as a result of the growth in distribution network assets under the company's capital expenditure program.

6. **Increasing Resource Costs** - increases in average unit costs for maintenance are expected, due to competition for resources and contractors.

7. **Metering services** – metering inspections will increase in line with the projected increase in customer connections. In addition, installation and data management costs are expected to increase, as increasing numbers of customers request interval meters.

8. **Call centre costs** - historically Western Power Retail has not charged the network business for fault call handling. In the future, however, the network business will enter into a service level agreement with Western Power Retail for the provision of these services and initial negotiations on formulating the terms and conditions for this agreement have commenced.

9. **Market reform** – increases in operating expenditure are expected as a result of the new regulatory and market environment.

10. **Insurance** - additional insurance costs are expected as a result of a tightening of the market.

A number of these cost drivers have already been noted in respect of network capital expenditure and in relation to transmission operating expenditure. In the remainder of this section, therefore, Western Power focuses on how the above cost drivers will be reflected in additional distribution-specific maintenance activities in the forthcoming access arrangement period.

Western Power is proposing overall increases in maintenance expenditures compared to historical levels. These increases are required in order to address a number of the cost drivers identified above. The operational factors that have led to increased expenditure include:

- increased costs associated with maintaining an aging asset base;
- an increased focus on improving staff and public safety following the identification of a number of key risk areas;
- addressing identified maintenance backlogs which have emerged following periods of budget constraints;
- the implementation of new asset management maintenance initiatives identified through the ongoing reviews of the network, such as bushfire and vegetation management initiatives, aerial inspections, and washing and silicon coating of insulators; and
- increasing average unit costs for many of the maintenance programs as a result of resource constraints for contract services and skilled labour.

A key characteristic of past maintenance expenditure has been the suboptimal mix of preventative and corrective programs, as a result of budget constraints In response, Western Power has now formulated programs for increased asset inspections, which are targeted to provide more timely information for undertaking rehabilitation works

prior to asset failure. This information will be critical to enabling the continual adjustments to maintenance and capital expenditure programs, in order to minimise total asset management costs whilst improving the overall reliability of the distribution network.

Western Power's proposed increase in inspections is targeted to ensure compliance with the Electricity (Supply Standards & System Safety) Regulations 2001, and to reduce the costs of corrective maintenance. In particular, Western Power's analysis suggests that increased expenditure in relation to vegetation management and pole inspections could reduce unplanned outages, and therefore have positive impacts on both reliability and corrective maintenance costs, whilst also reducing the risks of bush fires and public safety incidents. Specific examples of the increased activities targeted by Western Power are detailed below in Table 18 below.

Table 18: Key increased distribution maintenance activities

Pole Base Inspection and Treatment	Preventive routine inspection of poles from the ground, and sound wood testing of poles have been increased to comply with regulatory requirements and to reduce corrective maintenance costs. The company's adherence to a four yearly cycle is anticipated to reduce pole failures. The program also involves the chemical treatment for wood rot and termite infestation.
Vegetation Inspection	Routine 'vegetation spotting' patrols have been increased to identify vegetation encroachment into clearance zones, with specific emphasis on extreme and high fire risk areas. Medium and low fire risk areas are also included on a reduced inspection frequency.
Insulator Silicone Coating	Pole top fires have been identified by Western Power as a considerable factor influencing both the level and cost of supply restoration. The application of silicon grease to insulators has been introduced in order to reduce the incidence of pole top fires. This program covers most critical feeder sections close to the coast or in significant pollution zones. Pole top fires also represent a considerable safety and bushfire risk.
Line Patrols / Pole Top Inspection	This activity includes the inspection of overhead lines and pole top hardware from helicopter, light aircraft and EPVs. The inspections cover: • conductors and earth-wires; • cross-arms and insulators; • cable terminations; • capacitor banks; • surge arrestors; and • transformers. Pole top inspection programs cover approximately 200 feeders annually, representing one quarter of the feeders (or a four-year cycle). This activity provides an effective means of detecting sagging or deteriorating conductors, long bays or poor condition pole tops in order for preventative action to be taken before conductors clash or fall.
Ground Mounted Switchgear and Substation Inspections	This activity includes the inspection of substations and HV/LV ground mounted switchgear housed in indoor substations, compounds and kiosks. It also covers the four yearly routine maintenance of Ring Main Units (RMU) and is intended to identify equipment that is in poor condition.

As noted in relation to transmission operating expenditure, past budgetary constraints in preventative maintenance programs have resulted in some additional corrective expenditure. As a result of the proposed increases in preventative maintenance and inspections Western Power is projecting for corrective maintenance requirements to fall. The levels of reductions in corrective maintenance are based on estimations of outages and associated restoration works which indicate that savings of around 10% can be achieved in corrective deferred maintenance. The majority of these savings are expected to occur in 2007 as a result of the targeting of preventative maintenance programs to higher impact areas. From that time on the anticipated levels of expenditure should remain consistent with asset quantities and unit costs.

In addition, it was also noted in relation to transmission operating expenditure that the company is planning to commit additional resources to further development of a network management strategy. This expenditure will also encompass distribution maintenance activities, and is expected to deliver benefits by facilitating improvements in the cost-effectiveness of maintenance expenditure, and in network performance.

4.3 Western Power's approach for distribution operating expenditure

As noted earlier in this submission, Western Power has sought to constrain its capital expenditure to take account of resource and financing constraints. The application of these constraints should provide assurance to stakeholders that the proposed expenditure is prudent, and accords with the requirements of the Code's new facilities investment test.

In relation to distribution (as well as transmission) operating expenditure, Western Power has also sought to minimise the required increase in expenditure, recognising the cost drivers in the forthcoming regulatory period, the resource constraints and the need to provide customers with good value for money.

Taking all of these matters into account, Western Power believes it is appropriate for operating expenditure in the forthcoming regulatory period to be somewhat higher than historic levels and the SDP. However, Western Power does not believe that it would be appropriate to constrain distribution (or transmission) operating expenditure to the same extent as capital expenditure. Imposition of such constraints on operating expenditure would expose the company and its customers to excessive risk in terms of the long-term performance of the network. It is essential that Western Power has access to the resources it requires to implement preventative maintenance practices that are consistent with good electricity industry practice. It is also essential that the company has sufficient operating expenditure resources to enable it to comply with all health, safety and environmental obligations within a reasonable timeframe.

Although Western Power does not believe that it is appropriate to constrain operating expenditure unnecessarily, the company is nonetheless committed to delivering efficiency improvements. As noted earlier in this submission, in aggregate the network business believes that it can deliver operating expenditure efficiency gains of $10 million in 2005/06 and $20 million per year in 2006/07 and 2007/08. These gains have been factored into the forecasts of efficient operating expenditure for the forthcoming access arrangement period, set out in section 4.4 below. A substantial proportion of these savings will be delivered by Western Power absorbing, within the expenditure forecasts set out below, the expected increases in labour and materials

costs that will be associated with the planned increases in distribution maintenance activity over the forthcoming access arrangement period.

4.4 Western Power's forecast distribution operating expenditure

Figure 17 below shows actual and forecast total operating and maintenance expenditure, by category, for the period 2002/03 to 2008/09.

Figure 17 – Distribution total operating and maintenance expenditure ($ million in nominal terms)

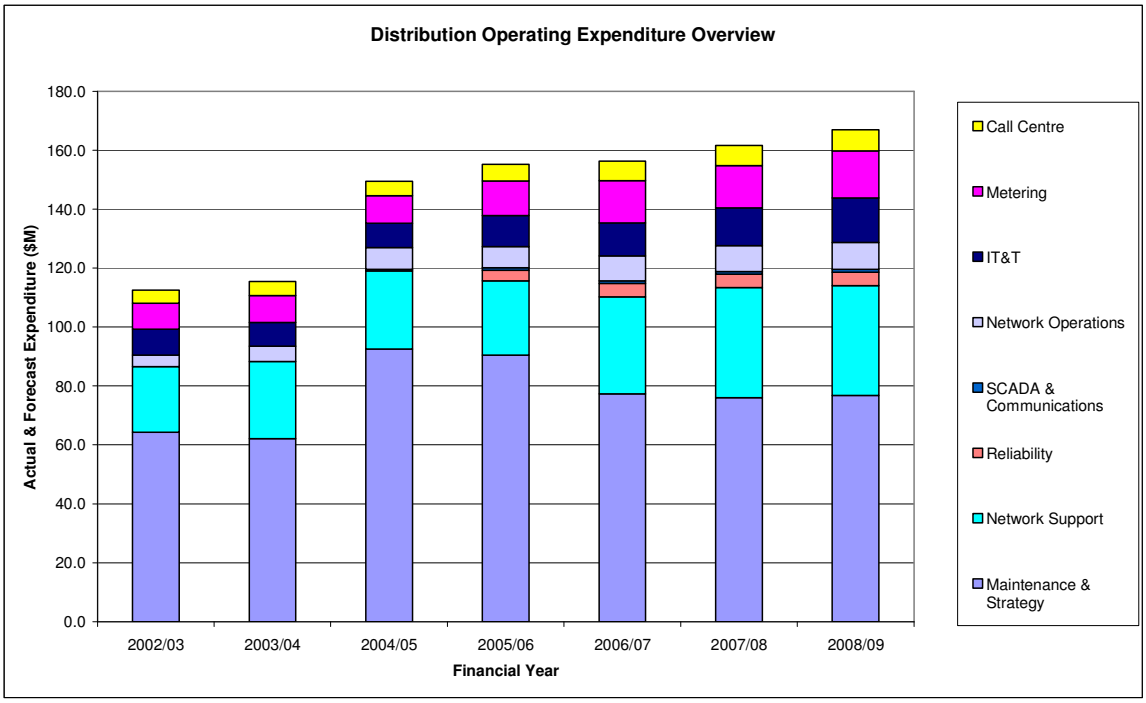


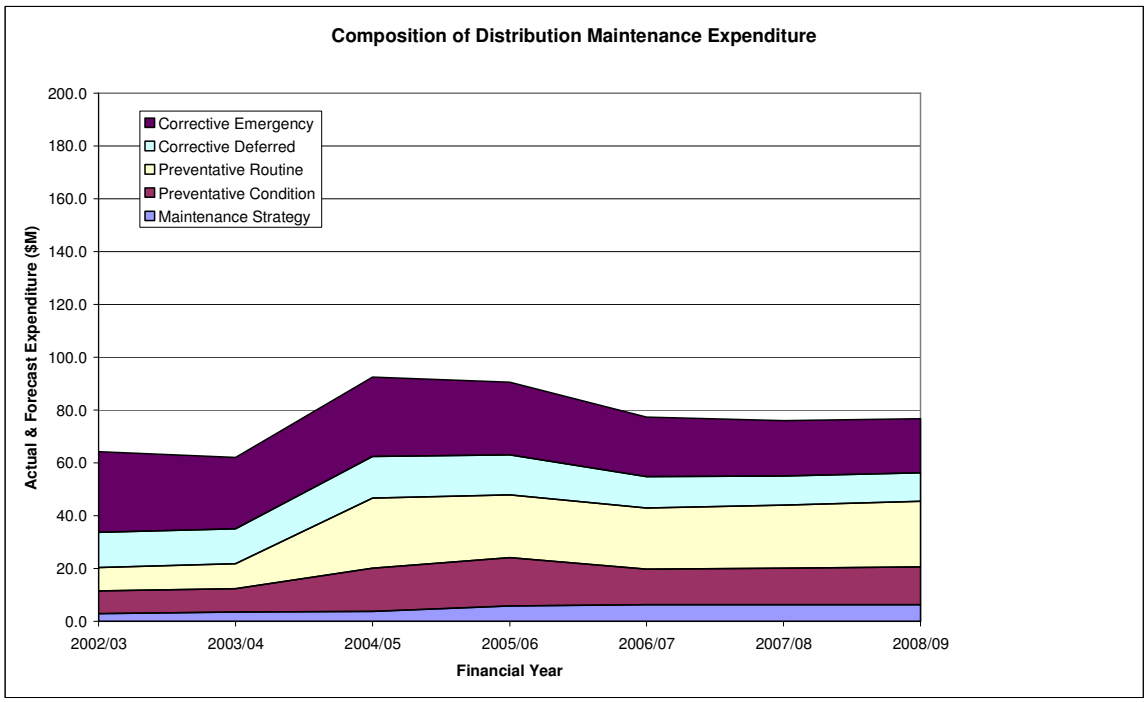
Table 19 below provides details of actual and forecast distribution maintenance expenditure over the period from 2003 to 2009.

Table 19 - Actual and forecast distribution maintenance expenditure (in nominal $ million)

	2003	2004	2005	2006	2007	2008	2009
Preventative Routine	8.9	9.3	26.6	23.8	23.3	23.9	24.8
Preventative Condition	8.6	8.9	16.3	18.4	13.5	13.8	14.3
Corrective Deferred	13.2	13.3	15.8	15.1	11.9	11.1	10.9
Corrective Emergency	30.6	27.0	30.0	27.5	22.4	21.0	20.5
Maintenance/Strategy	3.0	3.6	3.8	5.8	6.3	6.3	6.4
Total Maintenance	**64.3**	**62.1**	**92.5**	**90.5**	**77.3**	**76.0**	**76.8**

Figure 18 below provides a graphical summary of the composition of distribution maintenance expenditures over the same period.

Figure 18 – Composition of distribution maintenance expenditures (nomina dollars)



5 Asset valuation and depreciation

5.1 Introduction

The calculation of Western Power's target revenue in the forthcoming access arrangement period requires an assessment of the value of the capital base[39] and depreciation.

Section 5 of Part B of this submission sets out the approach applied by Western Power to establish the capital base and depreciation values used in the calculation of the target revenue for the transmission business over the first access arrangement period. With the exception of the matters noted in section 5.2 below, the approach described in section 5 of Part B of this submission is also applied by Western Power to establish the capital base and depreciation values used in the determination of the target revenue for the distribution business over the first access arrangement period.

5.2 Western Power's approach to depreciation – distribution assets

Two calculations involving depreciation[40] must be made for the purposes of establishing the capital base value and the target revenue for the first access arrangement period:

- The first calculation involves rolling-forward the 30 June 2004 asset value (established by the ERIU valuation[41]) to account for net additions since that date, in order to determine a capital base value as at 1 July 2006.

- The second calculation involves rolling-forward the capital base value as at 1 July 2006 to account for forecast net new facilities investment and depreciation, to derive a forecast of the capital base value for each year of the first access arrangement period.

Western Power's asset accounting systems provide limited detailed data by asset category on the level of investment undertaken by the company. The depreciation element of the "roll-forward" calculation has therefore been derived as follows:

- The proportion of different asset types that comprise the distribution system is changing over time, due to the introduction of more modern constructions. This means that the weighted average economic life of the entire portfolio of distribution assets is changing over time.

- Fortunately, Western Power has access to two recent valuations of distribution assets, which were undertaken in 2000 and 2004 (the ERIU valuation). These valuations have been used as a basis for estimating the recent changes in the weighted average life of the distribution network capital base.

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39 The capital base is defined in the Code as the value of the network assets that are used to provide covered services on the covered network determined under sections 6.44 to 6.63. The capital base value is an input into the calculation of Western Power's target revenue.

40 Use of the term "depreciation" throughout this submission and in the access arrangement denotes "regulatory depreciation" as defined in section 5.4 of Part B of this submission.

41 Western Power Corporation, Physical Assets Valuation as at 30 June 2004, Distribution and Transmission Networks: Report to the Valuation Committee, June 2004.

- The depreciation on distribution network capital expenditure undertaken over the two year period from 30 June 2004 can be imputed from the detailed data contained in the 2000 and 2004 valuations. A weighted average life for the new assets added over the two year period from 30 June 2004 can be inferred by dividing the total replacement cost of all assets added from 2000 to 2004, by the total annual depreciation for those assets (determined through the detailed 2000 and 2004 valuations as the summation of the depreciation charges for each individual asset category, as described above).

- On the reasonable assumption that the composition of distribution capital expenditure (by asset category) undertaken over the 2000-2004 period is representative of the composition of the expenditure undertaken over the two years since June 2004, the weighted average life inferred from this calculation can also be ascribed to the expenditure undertaken over the latter (two year) period. The annual deprecation charge attributable to expenditure undertaken over the two years since June 2004 can then be calculated, given the inferred weighted average life, and data relating to the total annual distribution capital expenditure.

Once the capital base value as at 1 July 2006 is determined in this manner, the depreciation charges applied to determine the forecast capital base value for each year of the first access arrangement period are based on the application of a straight line depreciation model, and a weighted average asset life for the entire capital base which is consistent with the asset lives set out in Appendix B-1 of the 2004 ERIU.

5.3 Proposed capital base and depreciation values

As noted above, Western Power has adopted an approach to valuing the capital base that utilises the 2004 ERIU asset valuation and rolls this forward for inflation, and net additions between 30 June 2004 and 1 July 2006. This section sets out details of the data and calculations applied to establish the capital base value over the period from 30 June 2004 to 30 June 2009.

The ODV valuation of the distribution capital base as at 30 June 2004 is summarised in Table 20 below.

Table 20: ODV valuation of SWIS distribution assets ($000) as at 30 June 2004[42]

Lines and cables	1,177
Transformers	253
Switchgear	118
Meters	163
Streetlights	78
Assets to be entered in registers at December 2003	41
Estimated additions to 30 June 2004	66
Total network assets	1,896
Other assets	67
Total SWIS Distribution Network Value	1,963
Less Written Down Value of Capital Contributions	648
Net SWIS Distribution Network Value	1,315

Based on the ODV value established by the 2004 ERIU valuation, and applying the approaches described above, the capital base value as at 30 June for each year over the five year period from 30 June 2004 has been calculated as shown in Table 21 below.

Table 21: Derivation of distribution capital base value (nominal $m)

	Year ending 30 June					
	2004	**2005**	**2006**	**2007**	**2008**	**2009**
Year of first access arrangement period				**1**	**2**	**3**
Opening capital base value	-	1,315	1,410	1,482	1,655	1,846
plus Escalation	-	30	34	36	40	45
plus Capital Expenditure	-	152	127	233	254	280
less Depreciation	-	83	86	92	99	107
less Disposals	-	5	3	4	4	4
Closing capital base value	1,315	1,410	1,482	1,655	1,846	2,060

[42] Source: Western Power Corporation, *Physical Assets Valuation as at 30 June 2004, Distribution and Transmission Networks: Report to the Valuation Committee*, June 2004, page 48.

6 The cost of capital

6.1 Introduction

As noted in section 6, Part B of this submission, the weighted average cost of capital (WACC) is a critical determinant of the level of Western Power's capital-related costs. These capital-related costs, in turn, comprise a substantial proportion of the company's total costs, and hence its target revenue.

6.2 Summary of Western Power's views

Western Power's view is that the estimated WACC should be the same for Western Power's transmission and distribution networks that comprise the SWIS. Therefore, the analysis and findings presented in section 6, Part B of this submission are equally applicable to this section. For ease of reference, Western Power's conclusions from section 6, Part B of this submission are:

- Western Power proposes to apply a real pre-tax WACC of 7.3% for the purpose of determining its target revenue for the first access arrangement period.

- As demonstrated in the discussion in section 6, Part B of this submission and in Appendices 4 and 5, Western Power's proposal:

    - takes account of pragmatic considerations such as the price path for network services in the immediate term, policymakers' expectations, and views already expressed by the Authority;

    - is within (or less than) the range of choice reasonably consistent with the Code objective and requirements;

    - is based on a thorough and robust analysis of the statistical uncertainty associated with establishing a point estimate of the WACC; and

    - takes proper account of the now widely accepted view (espoused by the Productivity Commission and other authoritative stakeholders) that the total costs to society of setting the regulatory WACC too low are much more severe than the costs of setting it too high.

- Furthermore, it is reasonable to argue that the uncertainty associated with the impending re-structuring of Western Power Corporation, coupled with a price control arrangement that treats capital contributions as revenue (foreshadowed in section 6 of this Part B) will lead to an increase in the volatility of costs and revenues, and therefore return on assets. This may, in turn lead to an increase in systematic risk borne by equity providers and additional credit risk to the providers of debt.

  It is further noted that treating capital contributions as regulated revenue has the effect of markedly decreasing the company's cash flow in the initial years of the new regulatory regime, and increasing cash flows in later years. The alternative cash flow streams would be the same in present value terms. Given the newness of the regulatory regime, however, delaying the return of capital to investors may expose Western Power to increased asset stranding risk. This observation implies that the cost of capital may be higher under the proposed approach to capital contributions.

Given the issues of restructuring and capital contributions, Western Power strongly believes that its proposed WACC of 7.3% is towards the lower end of the plausible range of WACC estimates.

- Application of the proposed WACC would facilitate the achievement of the Code objective set out in section 2.1 of the Code. In particular, the proposed WACC will promote economically efficient investment in, and operation of and use of Western Power's covered networks. Application of the proposed WACC is also consistent with the price control objective set out in section 6.4 of the Code, which requires amongst other things, that Western Power be given an opportunity to earn a level of target revenue for the access arrangement period that meets the forward-looking and efficient costs of providing covered services, including a return on investment commensurate with the commercial risks involved.

7 Total Revenue Requirement

7.1 Introduction

Section 6.2(a) of the Code states that:

> "Without limiting the forms of *price control* that may be adopted, *price control* may set *target revenue* by reference to the *service provider's approved total costs*."

Furthermore, in respect of the first access arrangement period, section 6.3 of the Code requires that the first access arrangement must contain the form of control described in section 6.2(a).

The earlier sections of this Part C provide a detailed explanation of Western Power's cost forecasts for the distribution network. Together, these cost forecasts comprise the approved total costs for the distribution network, for the purpose of determining target revenue. This approach to determining the annual revenue requirement of a regulated company is often referred to as the "building block" approach.

It is important to note that the Code is expected to be amended soon after the passage of the Electricity Corporations Bill 2005 (ECB), which provides the statutory basis for the Tariff Equalisation Fund and the recovery of a Tariff Equalisation Contribution (TEC) by Western Power from network tariffs. This Code change is expected to occur prior to the finalisation of the access arrangement review and will require both the Authority and Western Power to recognise the need to recover the TEC as determined by the Treasurer in accordance with the ECB. This will be a non-discretionary process for both the Authority and Western Power. Western Power's access arrangement therefore includes a provisional amount of $60 million per annum for the TEC, and these anticipated additional costs are reflected in the proposed reference tariffs and revenues described below.

The purpose of this section of the submission is to explain how each cost element discussed in the earlier sections of this Part C are combined to determine the target revenue in each year of the first access arrangement period. A similar calculation is explained in section 8, Part B of this submission in relation to the transmission network.

The remainder of this section is structured as follows:

- section 7.2 provides an overview of the building block method for determining the target revenue for the distribution network;
- section 7.3 provides details of the composition of the target revenue, including figures showing the trend of distribution revenue and average prices from 2002 to the end of the first access arrangement period;
- section 7.4 notes the reasons why the revenue that Western Power is permitted to collect under its price control may differ from the target revenue.

7.2 Overview of "Building Block" Revenue Determination Method

The revenue requirements are calculated as the sum of a series of "building blocks" which are summarised in Table 22, below. As already noted, the earlier sections of this submission provide detailed analysis of each building block element.

Table 22 – Summary of the building block components of target revenue

Target revenue component	Brief description	Cross-references for further details
Operations and maintenance costs	This is Western Power's annual cost of operating the distribution network, and maintaining the assets used in the delivery of *covered services*.	Section 4, Part C
Return of capital	This is the annual depreciation charge on the distribution assets used in the delivery of *covered services*.	Section 5, Part C
Return on capital	This is the product of the required rate of return (the *weighted average cost of capital*, or WACC) and the *capital base*. (The *capital base* for a *covered network* means the value of the network assets that are used to provide *covered services* on the *covered network* determined under sections 6.44 to 6.63 of the Code.) The *capital base* value over the *access arrangement period* is, in turn, a function of the depreciated value of assets at the start of the period, the level of annual depreciation recovered during the period, and the level of efficient new capital expenditure (*new facilities investment*) that is assumed to be required over the course of the *access arrangement period*.	Sections 5 and 6, Part C
Taxation	The pre-tax approach to WACC provides an allowance for company tax in the WACC.	Section 6, Part C

7.3 Forecast target revenue for the distribution network

Table 23 below shows the forecast capital-related costs for the distribution business for each year of the first access arrangement period. As noted above, the capital-related costs form part of the target revenue for the distribution network.

Table 23: Capital-related costs in nominal terms: Distribution

	Year ending 30 June		
	2007	**2008**	**2009**
Network Opening capital base ($M)	1,389	1,545	1,724
Network Capital expenditure ($M)	212	237	262
WACC	7.3%	7.3%	7.3%
Return on Network Capital Base ($M)	**112**	**124**	**139**
Non-Network Opening capital base ($M)	93	109	121
Non-Network Capital expenditure ($M)	21	17	19
$WACC_{nom}$	10.07%	10.07%	10.07%
Return on Non-Network Capital Base ($M)	**10**	**12**	**13**
Working Capital ($M)	38	46	49
Return on Working Capital ($M)	**4**	**5**	**5**
Total Return on Capital Base ($M)	**126**	**141**	**157**

Table 24 below shows Western Power's forecast for each building block component of the target revenue, together with the target revenue for the distribution business (being the sum of the building block components) for each year of the forthcoming access arrangement period. The table also shows the tariff revenue for the distribution business.

Table 24: Components of total annual revenue requirement for Distribution network in nominal dollars ($M)

Revenue Component	**Year ending 30 June**		
	2007	**2008**	**2009**
Operating Costs	156	162	167
Regulatory Depreciation	106	114	122
Return on Capital	126	141	157
TEC[43]	60	60	60
Revenue Smoothing Adjustment[44]	3	0	-8
Target revenue for distribution business	**451**	**477**	**498**
Deduct Capital Contribution Revenue	91	92	95
Deduct Misc Services Revenue	6	6	6
Tariff Revenue	**354**	**378**	**396**

43 Tariff Equalisation Contribution

44 The smoothing adjustment provides for a smooth revenue path over the regulatory period

Figures 19 and 20 show the trend in distribution tariff revenues and average distribution tariff prices in nominal dollars for the year ending 30 June 2002 to the end of the first access arrangement period.

Figure 19: Trend in Distribution Tariff Revenue in Nominal Dollars

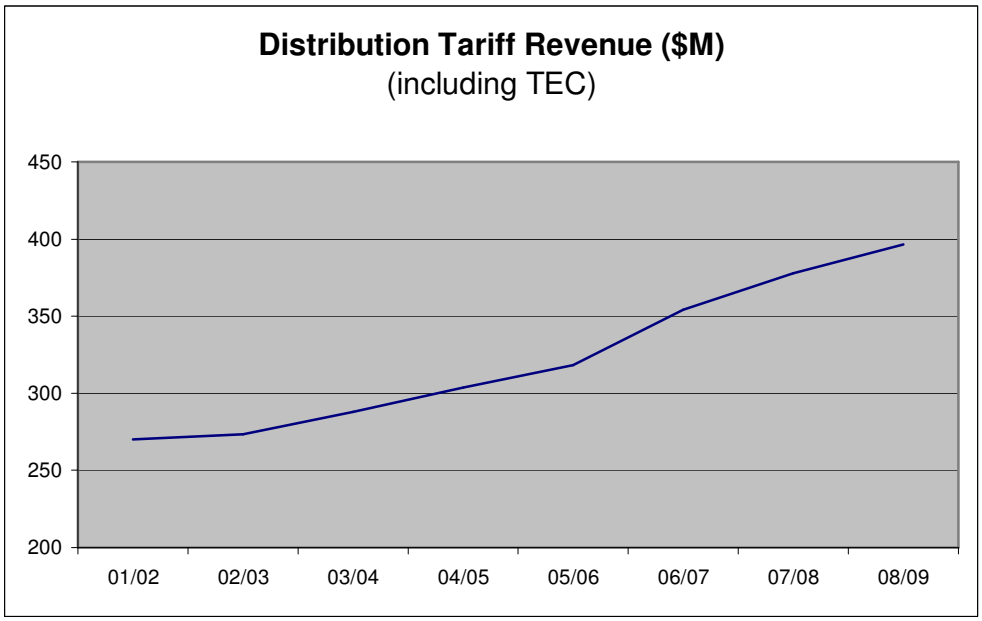
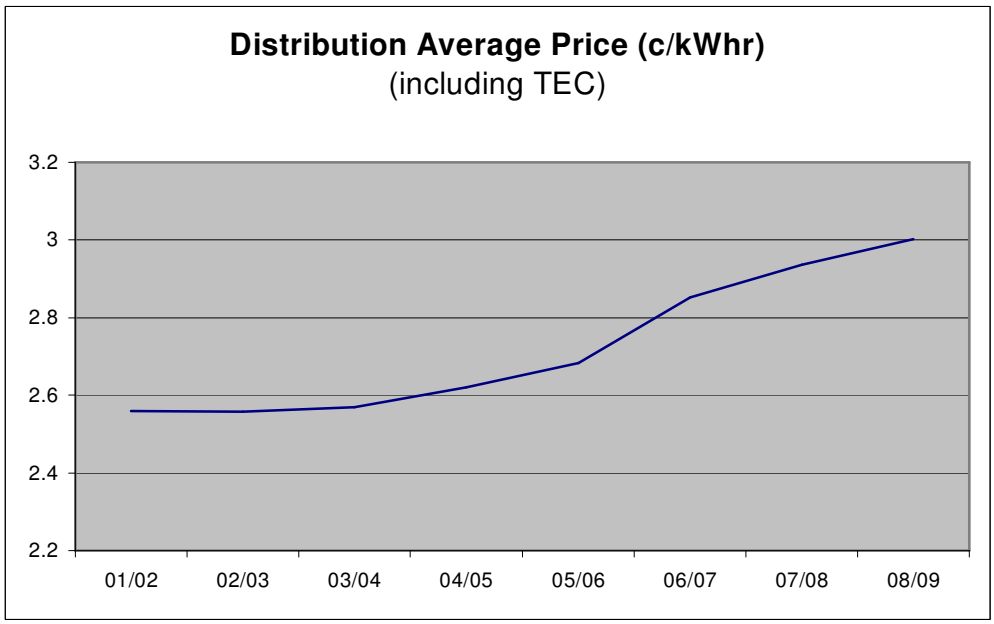


Figure 20: Trend in Distribution Average Price in Nominal Dollars



7.4 Relationship between actual revenue and target revenue

The target revenue determined from the forecasts of approved total costs represents the summation of the various revenue "building blocks", for a given set of assumptions. The target revenue values, along with the energy forecasts for the access arrangement period are used in the calculation of the price control that is to apply for the access arrangement period.[45]

As noted in section 8, Part B of this submission, the price control formula specifies the maximum revenue in each year (per unit of actual energy delivered by Western Power) that the company is permitted to collect from users of covered services. As noted in section 4, Part D of this submission, the price control includes various mechanisms that may permit Western Power to recover certain unforeseen costs that may arise during the access arrangement period. Moreover, the actual revenue collected by the company will be a function of actual, rather than forecast energy volumes. For these reasons, the maximum revenue that the company is permitted to collect each year under the price control may differ from the target revenue.

Further details of Western Power's price control are set out in the access arrangement.

[45] As noted in section 3, Part D of this submission, Western Power proposes to apply a revenue yield form of price control for the first access arrangement period. An explanation of the calculations applied to establish the X factor in the distribution price control is provided in Appendix 7 of the access arrangement.

PART D: REGULATORY FRAMEWORK

1 Introduction to Part D

Part D of this submission provides information that describes and explains the overall regulatory framework applying to Western Power's transmission and distribution networks.

Part D is structured as follows:

- section 2 examines the Code provisions relating to the definition of reference services, and develops an appropriate practical definition of reference services, based on Western Power's application of the relevant Code provisions;
- section 3 examines the Code provisions relating to the definition of service standard benchmarks, and develops an appropriate practical definition of service standard benchmarks, based on Western Power's application of the relevant Code provisions;
- section 4 provides information setting out the basis of the design of the price controls that are to apply to the transmission and distribution network businesses;
- section 5 outlines the pricing methods that Western Power proposes to apply;
- section 6 sets out the basis of the proposed applications and queuing policy;
- section 7 describes the basis of the proposed capital contributions policy;
- section 8 provides explanatory information relating to the proposed standard access contract;
- section 9 provides explanatory information relating to Western Power's transfer and relocation policy;
- section 10 examines the provisions of the Code that relate to trigger events. The rationale for the trigger events that Western Power proposes to include in its access arrangement is also set out; and
- section 11 provides information on the supplementary matters set out in the Code.

2 Definition of Reference Services

2.1 Introduction

Western Power's network business is focused on the efficient delivery of services at standards that meet or exceed its customers' expectations. The introduction of the Code, and Western Power's compliance with its provisions, should not divert the company's attention from service delivery. Importantly, however, the Code requires the company to express, or in some cases re-define, its price-service offering in a manner consistent with the provisions and terminology in the Code.

The purpose of this section of the submission is:

- to outline the terminology and provisions in the Code relating to service definitions; and
- to explain how Western Power has interpreted and applied these Code provisions in relation to the services that it provides to its customers.

2.2 Code provisions

This submission and the accompanying access arrangement only relate to services that are covered by the Code. The Code defines a covered service in the following terms:

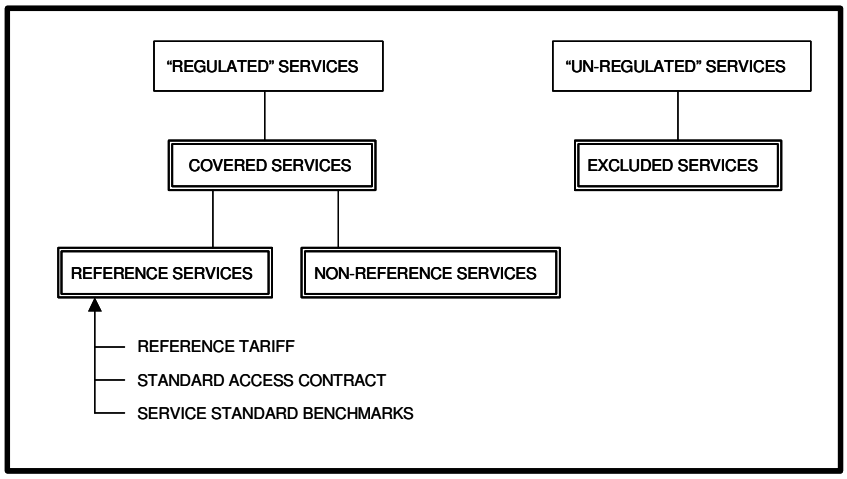
> "*covered service* means a *service* in relation to the *transportation* of electricity provided by means of a *covered network*, including:
>
> (a) a *connection service*; or
>
> (b) an *entry service* or *exit service*; or
>
> (c) a network use of system service; or
>
> (d) a *common service*; or
>
> (e) a *service* ancillary to a *service* listed in paragraphs (a) to (d) above, but does not include an *excluded service*."

The Code provides for three further categories of services that are relevant to the access arrangement:

- reference services;
- non-reference services; and
- excluded services.

Figure 21 below depicts these service categories and their relationships:

Figure 21: Categories of services under the Code



The Code defines each of these services as follows:

> "*reference service* means a *covered service* designated as a reference service in an *access arrangement* under section 5.1(a) for which there is a *reference tariff*, a *standard access contract* and *service standard benchmarks*."
>
> "*non-reference service* means a *covered service* that is not a *reference service*."
>
> "*excluded service* means a *service* in relation to the *transportation* of electricity provided by means of a *covered network*, including:
>
> (a) a *connection service*; or
>
> (b) an *entry service* or *exit service*; or
>
> (c) a network use of system service; or
>
> (d) a *common service*, or
>
> (e) a *service* ancillary to the *services* listed in paragraphs (a) to (d) above,
>
> which meets the following criteria:
>
> (i) the supply of the *service* is subject to effective competition; and
>
> (ii) the cost of the *service* is able to be excluded from consideration for *price control* purposes without departing from the *Code objective*."

The critical issue in distinguishing an excluded service from other covered services is that the Code sets out two criteria (items (i) and (ii) above) for determining whether a service should be classified as an excluded service. In addition, sections 6.33 to 6.37 of the Code set out a process under which the Authority may make a determination of excluded services for a covered network. Under that process, a service provider may at any time request the Authority to determine that one or more services are to be treated as excluded services.

Importantly, the Code also provides guidance on how reference and non-reference services should be distinguished. In particular, the Code contains the following provisions in relation to the definition of reference services:

(a) An access arrangement must specify one or more reference services (section 5.1(a)).

(b) An access arrangement must include a standard access contract for each reference service (section 5.1(b)),

(c) An access arrangement must include service standard benchmarks for each reference service (section 5.1(c))

(d) Reference services are those services that are likely to be sought by a significant number of users and applicants or a substantial proportion of the market for services in the covered network (section 5.2 (b)).

(e) Reference services should be specified in a manner that enables a user to acquire by way of one or more reference services only those elements of a covered service that the user wishes to acquire (section 5.2 (c)).

(f) Reference services should be defined in a way that enables users to acquire entry (or exit) services without having to acquire corresponding exit (or entry) services (section 5.2 (d)).

(g) Service standard benchmarks must be reasonable (section 5.6 (a)).

(h) Service standard benchmarks must be sufficiently detailed and complete to enable a user to determine the value represented by the reference service at the reference tariff (section 5.6 (b)).

The remainder of this section applies these definitional requirements to Western Power's services, and concludes with a proposed definition of reference services and non-reference services.

2.3 Definition of reference services

Western Power interprets the above Code provisions as collectively establishing a checklist of requirements that must be met in order for a service to be categorised as a reference service. In essence, if it is not possible or practical for a service to satisfy these requirements, then the service should be categorised as a non-reference service. It is also noted, for completeness, that there are a number of pricing provisions in the Code that relate specifically to reference services (in particular "pricing methods" in chapter 7).

In formulating Western Power's definition of reference services, it is instructive to start with the following three criteria set out in the Code:

1. Reference services are those services that are likely to be sought by a significant number of users and applicants or a substantial proportion of the market for services in the covered network (section 5.2 (b)).

2. Reference services should be specified in a manner that enables a user to acquire by way of one or more reference services only those elements of a covered service that the user wishes to acquire (section 5.2 (c)).

3. Reference services should be defined in a way that enables users to acquire entry (or exit) services without having to acquire corresponding exit (or entry) services (section 5.2 (d)).

In Western Power's view, the existing distribution and transmission tariffs (and the corresponding services) have been developed with these broad concepts in mind. Specifically, the existing Western Power tariffs reflect the services that a significant proportion of the company's customers want, without "bundling" services together in a manner that requires customers to acquire services that they do not want. On this basis, Western Power's view is that its existing tariffs provide a reasonable basis for defining reference services.

These tariffs comprise:

- 10 "bundled" tariffs for customers with loads connected to the distribution network are inclusive of both transmission and distribution charges which are separately calculated for financial and regulatory purposes, but are published as combined single tariffs for convenience. These tariffs are as follows:

Present Tariff Type	Description
1. Anytime Energy (Residential)	RT1[46]
2. Anytime Energy (Business)	RT2
3. Time of Use Energy (Small)	RT3
4. Time of Use Energy (Large)	RT4
5. High Voltage Metered Demand	RT5
6. Low Voltage Metered Demand	RT6
7. High Voltage Contract Maximum Demand	RT7
8. Low Voltage Contract Maximum Demand	RT8
9. Street lighting	RT9
10. Unmetered Supplies	RT10

- One distribution service for generation customers directly connected to the distribution network:

1. Distribution Entry Service	RT11

- Two transmission services for customers directly connected to the transmission network, as follows:

1. Transmission Exit Service	TRT1
2. Transmission Entry Service	TRT2

[46] "RT" refers to reference tariff which comprises bundled transmission & distribution services. "TRT" refers to transmission reference tariff. Further details of these tariffs are provided in Western Power's access arrangement.

Whilst Western Power's existing tariffs provide a reasonable basis for determining reference services, two further issues must be considered:

Firstly, the reference services must also be capable of being provided subject to a standard access contract (in accordance with section 5.1(b)) and service standard benchmarks (section 5.1(c)). The 13 services listed above meet these requirements:

- The services can be provided under the terms and conditions set out in a standard access contract. Western Power's standard access contract is based on the model contract set out in appendix 3 of the Code. Section 8 of this Part D explains Western Power's modifications to the model standard access contract.

- As noted in section 3 below, service standard benchmarks can be defined for each reference service.

The second issue to be addressed is whether Western Power presently provides some non-tariff services that should also be categorised as reference services. As noted earlier, for a non-tariff service to be classified as a reference service it must satisfy the requirements established by the Code.

The non-tariff services presently provided by Western Power are:

(1) Non-standard meter reading services;

(2) Relocation of assets for customers (poles, pillars);

(3) Service disconnects/reconnects at customer request;

(4) Quotations & construction of new assets;

(5) High load escorts;

(6) Inspection services;

(7) Connection services, transfer fees; and

(8) Other miscellaneous network services as notified to customers from time to time.

Western Power considers that many of these services do not constitute covered services as they are not directly related to the transportation of electricity. However, it is acknowledged that some of the services could conceivably be described as ancillary to a covered service, and on this basis, a number of the above services could arguably be categorised as reference services.

In addition, it is noted that a number of these services are likely to be sought by a significant number of users and applicants or a substantial proportion of the market for services in the covered network. In particular, connection services and meter reading are matters that end-use customers will require on a regular basis. On this basis, it is conceivable that some of the above services could be categorised as reference services.

In considering this issue further, Western Power notes that the Code defines reference services as follows:

> "reference service" means a *covered service* designated as a reference service in an *access arrangement* under section 5.1(a) for which there is a *reference tariff*, a *standard access contract* and *service standard benchmarks*.

Whilst noting that the relevant Code provisions are open to different interpretations, Western Power believes that the focus of reference services is intended to relate to "access to the network" rather than "services to end-use customers". This interpretation is supported by the draft provisions of the standard access contract provided in appendix 3 of the Code. These draft provisions refer to the contract being between the service provider (in this case Western Power) and "UserCo", the party that 'has made an access application under the access arrangement.'[47] The party to an access arrangement will typically be a retailer, rather than an end-use consumer.

Western Power therefore considers that a particular service should be categorised as a non-reference service when:

- the service is not directly related to access provision; and therefore
- it is not possible or practical to set service standard benchmarks in relation to these services or to provide them in accordance with a standard access contract.

On this basis, Western Power proposes that the eight non-tariff services (listed above) presently provided by the company should (to the extent that they constitute a covered service at all) be treated as non-reference services.

2.4 Identification of Excluded Services

As at the time of lodging this submission:

- the Authority had not made a determination of excluded services for a covered network under powers conferred on the Authority by sections 6.33 to 6.37 inclusive; and
- Western Power does not intend to seek a determination of excluded services pursuant to section 6.35 of the Code.

Accordingly, there are presently no excluded services identified in Western Power's access arrangement. Notwithstanding this, it is noted that Western Power may, under section 6.35, at any time request the Authority to determine under section 6.33 that one or more services provided by means of the SWIS are excluded services.

[47] Code, appendix 3, page 5469

3 Service standard benchmarks

3.1 Introduction

This section provides details of Western Power's service standard benchmarks in respect of each reference service. As noted in section 2.3 of this Part D, the Code sets out a number of requirements with respect to the definition of reference services, and the standard terms and conditions that should apply to their provision. In particular, the Code (in section 5.1(c)) requires that an access arrangement must include (amongst other things) service standard benchmarks for each reference service.

This section addresses the requirements of section 5.1(c) of the Code, and is structured as follows:

- section 3.2 examines the Code provisions relating to service standard benchmarks;
- section 3.3 explains Western Power's approach to setting service standard benchmarks in light of the applicable Code provisions;
- section 3.4 describes Western Power's service standard benchmarks against each transmission reference service;
- section 3.5 describes Western Power's service standard benchmarks against each reference service provided to users connected to the distribution network;
- section 3.6 briefly describes Western Power's other commitments and obligations regarding service delivery that do not form part of the service standard benchmarks; and
- section 3.7 sets out concluding comments.

3.2 Code provisions relating to service standard benchmarks

The Code defines service standard benchmarks as:

> "the benchmarks for *service standards* for a *reference service* in an *access arrangement* under section 5.1(c)."

In turn, the Code defines service standards as:

> "either or both of the technical standard, and reliability, of delivered electricity."

It is noted that neither "technical standard" nor "reliability" are defined terms in the Code.

Section 5.6 of the Code provides the following guidance in setting service standard benchmarks:

> "A *service standard benchmark* for a *reference service* must be:
>
> (a) reasonable; and

(b) sufficiently detailed and complete to enable a *user* or *applicant* to determine the value represented by the *reference service* at the *reference tariff*."

The Code indicates that service standard benchmarks also play an important role in providing Western Power with an incentive to deliver service improvements. In particular, section 6.9 defines a *service standards adjustment mechanism* as:

> "a mechanism in an *access arrangement* detailing how the *service provider's* performance during the *access arrangement period* against the *service standard benchmarks* is to be treated by the *Authority* at the next *access arrangement review*."

Section 11.1 of the Code also refers to service standard benchmarks, as follows*:*

> "A service provider must provide reference services at a service standard at least equivalent to the *service standard benchmarks* set out in the access arrangement and must provide non-reference services to a service standard at least equivalent to the service standard in the access contract."

In terms of reporting against the service standard benchmarks, section 11.2 of the Code states:

> "The *Authority* must monitor and, at least once each year, *publish* a *service provider's* actual *service standard* performance against the *service standard benchmarks*."

In summary, therefore, the Code requires Western Power to propose service standard benchmarks that:

1. are reasonable, and sufficiently detailed and complete to enable a user or applicant to determine the value represented by the reference service at the reference tariff (section 5.6 of the Code); and

2. can be applied in the service standards adjustment mechanism (section 6.9); and

3. set the level of service that Western Power should provide to users of reference services (section 11.1).

Against this backdrop, Western Power's approach to setting service standard benchmarks is discussed in detail in section 3.3, below.

3.3 Western Power's approach to setting service standard benchmarks

3.3.1 Defining the "target" level of service to be delivered

As noted in the Part A of this submission:

- there is a need for service performance to be improved markedly from recent historic levels; and accordingly

- Western Power's capital and operating expenditure plans (which involve increases in expenditure compared to recent actual levels of spending) are aimed at enabling the company to deliver substantial improvements in service performance.

Over the first access arrangement period and beyond, the prices paid by Western Power's customers will reflect the costs associated with achieving the planned improvements in service. Western Power therefore recognises that the service standard benchmarks should reflect the substantial improvements in average performance that the company plans to achieve over the first access arrangement period.

Whilst Western Power will plan its investment and expenditure programs, and use its best endeavours to meet these challenging service standard benchmarks, the company cannot guarantee that the service standard benchmarks will always be met. Instead, Western Power believes that the objectives of the Code are best satisfied by:

- setting service standard benchmarks which are commensurate with the standard of service that the company is targeting to deliver, given its expenditure plans; and

- in accordance with the spirit of the provisions set out in section 11.1 of the Code, exposing the company to a financial penalty (via the service standards adjustment mechanism) in the event that actual performance falls short of the benchmark level. The service standard adjustment mechanism will also provide Western Power with an opportunity to earn a bonus if performance is better than the benchmark.

The company's proposal to set "challenging" service standard benchmarks, and to be exposed to financial penalties for non-performance is predicated on Western Power's reasonable expectation that the Authority will determine that the company's proposed increases in expenditure are warranted.

It should also be noted that in addition to the financial incentives provided by the service standards adjustment mechanism, Western Power's service performance will be subject to a monitoring and reporting regime (to be administered by the Authority pursuant to section 11.2 of the Code). This monitoring and reporting regime will provide an incentive to the company to meet or exceed the service improvements to which it has committed, and will provide suitable assurances to interested parties with regard to service delivery.

3.3.2 Service standard benchmarks to provide information to users or applicants

As noted above, the service standard benchmarks form the yardstick against which the company's actual performance is assessed for the purpose of:

- the service standards adjustment mechanism; and

- the performance monitoring and reporting regime to be administered by the Authority.

In addition to these two functions, the Code requires that the service standard benchmarks provide sufficient detail to enable a user or applicant to determine the value represented by the reference service at the reference tariff. This section of the submission sets out Western Power's interpretation of this Code requirement, and explains how Western Power intends to address it.

In considering the Code's requirements on the provision of information to users regarding the value of reference service, it is worth noting that the user referred to in the Code will typically be a retailer or a generator. The commercial value that a retailer or generator places on the standard to which a reference service is provided will depend in part on the commercial arrangements between each user and their customers. As competition in the retail and generation sectors develop, users may ascribe increasingly diverse values to the provision of reference services. In this regard, it is impractical to devise service standard benchmarks to enable a user to precisely "determine the value represented by the reference service at the reference tariff".

In the light of the above discussion, Western Power interprets section 5.6(b) of the Code as requiring Western Power to provide the user with meaningful information regarding:

- the standard of service that a user can reasonably expect to obtain in exchange for purchasing a particular reference service;

- the aggregate compensation that will be paid to users of reference services (as a whole) via the service standards adjustment mechanism if the applicable benchmark service standard is not satisfied; and

- the aggregate reward accruing to Western Power via the service standards adjustment mechanism in respect of the reference services if actual network-wide service performance exceeds the applicable benchmark service standard.

Western Power notes that an appropriately defined service incentive adjustment mechanism will provide the above information to users and applicants. Specifically, Western Power is confident that its proposed access arrangement satisfies sections 5.6(a) and (b) of the Code, in that it will provide useful information to users as a whole regarding the benchmark service standard for each reference service. In essence, Western Power's revenue will vary by up to + or – 1% depending on its performance against the service standard benchmarks. This change in revenue will be given effect through changes to reference tariffs that reflect the level of service provided by Western Power.

In summary, Western Power believes that the requirements of section 5.6(b) of the Code can be met by the proposed service standard benchmarks that are presented in sections 3.4 and 3.5 below, in relation to transmission and distribution respectively.

3.4 Service standard benchmarks for transmission reference services

3.4.1 Arrangements in the National Electricity Market

In the course of developing service standard benchmarks for its transmission reference services, Western Power has examined the approaches applicable to electricity transmission companies in other Australian jurisdictions. The ACCC has been responsible for regulating Transmission Network Service Providers (TNSPs) in the eastern states of Australia since the mid late 1990s, so its experience in this area is instructive.

A review of the information published by the ACCC on transmission performance standards suggests that the ACCC has found very little commonality in performance data and standards among transmission companies in Australia and internationally.

Moreover, the ACCC has acknowledged that the application of performance benchmarks requires consideration of the unique and complex operating environments of the individual companies. Consequently, the ACCC has chosen to use the actual performance levels achieved by each TNSP in recent years as a guide when setting future performance targets for each TNSP.

Standardised performance indicators for TNSPs have only recently been introduced by the ACCC. The general categories of indicators applied are:

- circuit availability;
- loss of supply event frequency;
- average outage duration; and
- transmission constraints.

The ACCC has also recognised that there is a requirement for some flexibility in the definitions of the indicators that would broadly measure the same parameters. In this regard, a key consideration is to ensure that the performance of each individual TNSP is measured consistently over time, having regard to each TNSP's particular measurement systems and performance data. This consistency, in turn, preserves the incentive for TNSPs to seek continuous performance improvement over time. The standard definitions may therefore be modified to align with the information that a particular TNSP has been collecting in the past.

3.4.2 Proposed performance measures

As has been common practice elsewhere in Australia, Western Power has previously developed various performance indicators for internal use. However, the service standard indicators currently used by Western Power are not consistent with those which have recently been introduced by the ACCC.

Western Power recognises the benefits of applying service standard performance indicators which are consistent with those used elsewhere in Australia. However, in selecting the performance measures to apply to Western Power for the first access arrangement period, a critical consideration is whether it is possible to establish a reasonable record of historical performance against a particular proposed performance measure. As already noted, this is an important consideration because there is a need to establish future performance targets that are consistent with recent actual levels of performance, as well as planned future expenditure.

Circuit Availability is the most commonly used indicator for transmission service standards in Australia. As noted below, there are a number of good reasons for Western Power to adopt this performance measure for the first access arrangement period:

- Circuit Availability is the most general of the standard indicators.
- Circuit Availability can be calculated to include all outages (that is, both planned and unplanned outages).
- Circuit Availability can be calculated to include all transmission assets (that is, both shared network and connection assets).

- Circuit Availability is used by many other TNSPs in Australia and is also used as the sole service standard indicator by some. This measure therefore enables comparison of performance between TNSPs (to the extent that the scope of reported events and exclusions are similar).

- Historical Circuit Availability can be readily calculated for Western Power's transmission network from existing data in order to establish realistic and meaningful future performance targets.

Circuit Availability is calculated from the sum of all outage durations in hours divided by the total number of circuits times the number of hours in a year. This index provides an indication of the overall level of reliability of the network; it essentially measures (as a proportion of total time) the extent to which supply is available via each major component in the network.

Western Power proposes to adopt Circuit Availability as one of the performance measures to be applied in the definition of the company's transmission service standard benchmarks.

While availability provides a useful measure of overall reliability, the interconnected nature of the network means that the measure provides little true indication of the impact of faults on customers. This is because only about 2 to 3% of all transmission faults involve loss of supply to end customers.

Two of the three performance indicators favoured by the ACCC (namely loss of supply event frequency and average outage duration) are intended to provide measures of transmission network performance from the perspective of end customers. The indicator applied by Western Power to measure performance from the end customer's perspective is System Minutes Interrupted. This measure is calculated as MWh of electricity not supplied times 60, divided by the system peak demand in MW.

This measure is preferred by Western Power because:

- it provides a meaningful indication of the overall impact of transmission faults on customers;

- the index is normalised by the system peak demand, making it more useful in comparing the performance of systems of different sizes; and

- importantly, reliable historical records exist.

Western Power proposes the use of this indicator for meshed circuits only. Radial network elements are relatively few in number and their performance is dramatically affected by even a single significant event, making the setting of a meaningful target level (and bandwidth for the service standards adjustment mechanism[48]) somewhat meaningless.

The final indicator applied by the ACCC (relating to transmission constraints) is not particularly meaningful in Western Power's case, given the nature and configuration of the transmission network and the location of major generating plant.

[48] Details of the service standards adjustment mechanism are set out in section 4.8 of this Part D.

In summary, Western Power proposes to use System Minutes Interrupted (for meshed circuits only) and Circuit Availability as the measures of the service standard benchmarks for transmission reference services under the access arrangement.

3.4.3 Definition of transmission performance indicators

The performance indicators to be applied in the definition of the service standard benchmark applying to transmission reference services shall be Circuit Availability, and System Minutes Interrupted (meshed network) as defined below:

Performance Indicator:	Circuit Availability
Unit of measure:	Percentage of total possible hours available.
Source of data:	SCADA and System Operation Databases
Definition/Formula:	$\frac{\text{No of Hours per Annum Circuits are Available}}{\text{Total Possible No. of Circuit Hours}} x100$ Definition: The actual circuit hours available for transmission circuits divided by the total possible defined circuit hours available.
Exclusions:	• All zone substation equipment including power transformers • Tee configuration line circuits • Unregulated transmission assets. • Outages shown to be caused by a fault or other event on a '3rd party system' e.g. intertrip signal, generator outage, customer installation. • Force majeure events.
Inclusions:	• 'Circuits' includes primary transmission equipment such as overhead lines, underground cables and bulk transmission power transformers. • Circuit 'unavailability' to include outages from all causes including planned, forced and emergency events, including extreme events, but not including the events defined as exclusions.

Performance Indicator:	System Minutes Interrupted (Meshed Transmission Network)
Unit of measure:	Minutes
Source of data:	SCADA and System Operation Databases
Definition/Formula:	$\sum \frac{\text{MW Minutes of Unserved Energy at Substations on Meshed Network}}{\text{System Peak MW}}$ Definition: The summation of MW Minutes of unserved energy at substations which are connected to the meshed transmission network (which are not radially fed) divided by the system peak MW.
Exclusions:	• Zone substations connected to the transmission network via radial connections. • Unregulated transmission assets. • Outages shown to be caused by a fault or other event on a '3rd party system' e.g. intertrip signal, generator outage, customer installation. • Force majeure events.
Inclusions:	• All unserved energy due to outages on any primary transmission equipment including all overhead lines, underground cables, power transformers, static var compensators, capacitor banks, etc. including primary zone substation equipment. • All unserved energy due to outages for forced and emergency events, including extreme events, but not including the events defined as exclusions.

3.4.4 Service standard benchmarks – transmission reference services

The service standard benchmarks applying to transmission reference services for the first access arrangement period are:

- consistent with the expectation that recently achieved standards of service will be maintained or improved; and
- consistent with the level of maintenance and capital expenditure that the company plans to undertake over the course of the first access arrangement period.

Ideally, the service standard benchmark for the first access arrangement period should be developed with reference to many years of data on past performance. However, the availability of suitable data for this purpose is limited, so Western Power has derived the service standard benchmark with reference to circuit availability data from the year 2000 onwards only.

Data showing historical performance for the proposed indicators of Circuit Availability and System Minutes Interrupted have been obtained from existing databases. Table 25 below shows Western Power's transmission performance in terms of the Circuit Availability measured from July 2000 to June 2005 (on a financial year basis).

Table 25: Circuit Availability: historical performance

		2000/01	2001/02	2002/03	2003/04	2004/05
All Transmission Lines	%	98.99	98.78	98.28	98.61	98.64
	Circuit Days	*56,817*	*57,828*	*58,002*	*58,436*	*55,758*
Bulk Transmission Transformers	%	98.20	99.32	99.61	99.46	99.53
	Circuit Days	*9,855*	*9,855*	*9,855*	*9,882*	*9,315*
Circuit Availability (weighted %)		98.87	98.86	98.47	98.73	98.77

Table 26 below shows Western Power's transmission performance in terms of the System Minutes Interrupted, measured from July 2000 to June 2005 (on a financial year basis).

Table 26 System Minutes Interrupted: historical performance

	2000/01	2001/02	2002/03	2003/04	2004/05
Meshed network	6.5	7.8	10.8	7.9	5.8

The above data show that over the five year periods from 2000/01 to 2004/04, the average level of transmission network performance against each indicator is as follows:

- Average Circuit Availability 98.74%
- Average System Minutes Interrupted (Meshed) 7.8 minutes
- Median System Minutes Interrupted (Meshed) 8.3 minutes

As already noted the service standard benchmarks for the first access arrangement period will reflect an expectation that current performance is at least maintained. It is therefore important that the targets are robust, and reflect achievable and sustainable performance which is consistent with the expenditure that Western Power will undertake over the first access arrangement period.

The inherent uncertainty associated with extrapolating the relatively limited time series of historical data which is available suggests that a conservative approach should be adopted in setting service standard benchmarks for the first access arrangement period. Accordingly, Western Power proposes to adopt the mid-point of the range of actual performance over the previous 5 years for each of the service standard performance indicators as the service standard benchmarks for each year of the first access arrangement period, as shown in Table 27 below.

Table 27: Service standard benchmarks for transmission reference services

	First access arrangement period		
	Year ending June 2007	**Year ending June 2008**	**Year ending June 2009**
Circuit Availability (% of total time)	98.67	98.67	98.67
System Minutes Interrupted (meshed network)	8.3	8.3	8.3

These targets do not reflect the possible impacts of any changes to the network operating environment which may be required as a result of the introduction of the Wholesale Electricity Market. Accordingly, Western Power proposes that the impact of any such changes should be taken into account in measuring Western Power's performance.

Western Power proposes that a service standard adjustment mechanism be applied during the first access arrangement period, to provide the company with incentives to meet and exceed the service standard benchmarks set out above. Details of the service standard adjustment mechanism are set out in section 4.8 of this part D.

3.5 Service standard benchmarks: Reference services for users connected to the distribution network

3.5.1 Considerations relevant to defining service standards

Service standard benchmarks for users connected to the distribution network must be defined in a manner that is meaningful to users of the service, and which facilitates ready measurement of Western Power's service delivery performance, having regard to the available data and established data gathering processes and systems. With these basic considerations in mind, Western Power proposes to define service standard benchmarks for reference services provided to users connected to the distribution network in terms of network reliability.

A brief overview of the proposed network reliability measure, and the role of the service standard benchmarks is set out below:

- Reliability is presently, and will continue to be, measured in terms of average or network-wide performance for the Urban and Rural sub-networks.
- The service standard benchmarks relating to reliability will be applicable to all reference services provided to users connected to the distribution network.
- The service standard benchmarks relating to network reliability will be used as the yardstick for measuring the company's actual performance under the service standard adjustment mechanism. Thus, the company's performance relative to the reliability service standard benchmarks will determine the reward provided to, or the penalty paid by the company in relation to the service performance actually delivered by the company.

- The service standard benchmarks relating to network reliability form the basis for the performance monitoring and reporting regime to be administered by the Authority pursuant to section 11.2 of the Code.

Reliability performance varies significantly from location to location across the distribution network. As a result, the service standard benchmark associated with each reference service needs to reflect the geographic variation of reliability performance for different users of each reference service across the network, while being meaningful to retailers and end-use customers.

3.5.2 Proposed performance measures

With the foregoing considerations in mind, Western Power proposes to use a single measure of average or network-wide reliability performance, SAIDI[49] (System Average Interruption Duration Index), to specify the service standard benchmarks relating to network reliability. Adoption of the SAIDI measure for this purpose is appropriate in light of the Code's requirements for the following reasons:

- SAIDI has been the primary measure of reliability applied to the SWIS for some years, and it is well understood by all stakeholders, including end customers (by whom the concept of total interruption time per annum is most readily understood).

- SAIDI is the reliability performance measure used by Western Power in its network planning and investment evaluation processes. It is the primary network reliability performance measure used to underpin the proposed forecast expenditures. It therefore provides a sound basis against which to measure the outcomes actually produced by Western Power's proposed expenditure program over the first access arrangement period.

- SAIDI encapsulates both interruption frequency and restoration time. It therefore provides a sound comprehensive measure of reliability performance in a convenient, single metric.

- Reliability performance monitoring using SAIDI as the performance measure is readily supported by existing data collection processes and systems.

It is proposed that the geographic variability of SAIDI across the network be taken into account by specifying different reliability service standard benchmarks for two sub-networks of the SWIS distribution system, namely "Urban" and "Rural". The definitions of these two sub-networks are consistent with those applied in the Code of Conduct for the Supply of Electricity to Small Use Customers ("Customer Code"). This approach to defining separate SAIDI service standard benchmarks for the Urban and Rural sub-networks is appropriate in light of the Code's requirements for the following reasons:

- The "Urban" sub-network includes the Perth metropolitan area plus the major towns of Geraldton, Bunbury, Albany and Kalgoorlie, with all other areas classified as "Rural". The distinction between the Urban and Rural sub-networks is readily understood and is meaningful to customers.

[49] SAIDI is the total average time (in minutes) over a 12 month period that customers connected to a network experience non-availability of power supply.

- The application of the pre-existing definitions of the Urban and Rural sub-networks provides a desirable consistency with the Customer Code.

- Western Power recognises that a more region-specific definition of sub-networks for the purpose of setting SAIDI service standard benchmarks may possibly be more meaningful to some customers. However, the existing reliability reporting systems are based on electrical system parameters (such as load areas, feeders, etc.) which are not compatible with more detailed regional definitions of SAIDI service standard benchmarks. There are practical constraints that govern the extent of the detail that can be adopted in distinguishing between different parts of the network for reliability performance monitoring purposes. Application of the proposed definitions of the Urban and Rural sub-networks and their corresponding SAIDI service standard benchmarks represents a practicable approach to accounting for the geographic variation of reliability performance across the SWIS.

The SAIDI performance measure is defined in section 3.5.3 below. Western Power's service standard benchmarks for reference services for users connected to the distribution network are set out in section 3.5.4 below.

3.5.3 Definition of SAIDI performance indicator

The SAIDI performance indicator is defined as follows:

Performance Indicator:	System Average Interruption Duration Index (SAIDI)
Unit of measure:	System minutes per annum
Definition:	Over a 12 month period, the sum of the duration of each sustained (greater than 1 minute) customer interruption (in minutes) attributable solely to distribution (after exclusions) divided by the average of the total number of connected *consumers* at the beginning and end of the period.
Exclusions:	• Major event days in accordance IEEE1366-2003 definitions as adopted by Steering Committee on National Regulatory Reporting Requirements (SCNRRR). • Outages shown to be caused by a fault or other event on the transmission system or a third party system (for instance, without limitation outages caused by an intertrip signal, generator unavailability or a customer installation). • *Force majeure* events.

3.5.4 Service standard benchmarks: reference services for users connected to the distribution network

As stated elsewhere in this submission, Western Power's overall service performance objective is to achieve a 25% improvement in reliability from the June 2004 SAIDI by June 2009 (i.e. the end of the first access arrangement period). Western Power has applied the 25 percent improvement target to both the Urban and

Rural sub-networks, to develop the proposed reliability service standard benchmarks, as shown in Table 28 below:

Table 28: SAIDI service standard benchmarks (expressed as system minutes per annum)

	Year ending June 2005	Year ending June 2006	First access arrangement period		
			Year ending June 2007	Year ending June 2008	Year ending June 2009
SWIS total	294	289	277	259	224
Urban	256	252	242	226	195
Rural	539	530	509	476	410

Western Power proposes that a service standard adjustment mechanism be applied during the first access arrangement period, to provide the company with incentives to meet and exceed the service standard benchmarks set out above. Details of the service standard adjustment mechanism are set out in section 4.8 of this part D.

3.6 Western Power's other commitments and obligations regarding service delivery

The foregoing discussion has focused on the setting of service standard benchmarks in relation to reference services. This focus is appropriate given the requirements of the Code provisions that relate to service standard benchmarks. However, it is also important to note that Western Power has other commitments and obligations regarding service delivery in addition to those defined by the service standard benchmarks.

For completeness, it is important to note the following service delivery obligations and commitments, which are highly relevant to users of the network and end-consumers of electricity:

- Quality of supply obligations in the Technical Rules: These obligations have been an important driver of Western Power's expenditure plans as discussed in Parts B and C of this submission.

- Western Power's Networks Customer Charter: The Charter applies to residential and small business customers using less than 50 MWh of electricity per year. This group of customers comprises some 98% of all customers. The Charter sets out comprehensive information about Western Power's network services and associated standards of service for these customers, along with these customers' rights and obligations in their relationship with Western Power's Network Business.

- Western Power's Customer Reliability Payment Scheme. This scheme was announced by Government in March 2005, and applies to all households and small businesses using less than 50 MWh per year. A rebate of $80 is paid to

any eligible customer who experiences a supply interruption in excess of 12 hours duration.

It should also be noted that in addition to the obligations described above, Western Power also has a wide range of environmental and health and safety obligations that must be met. It is important for interested parties to note, therefore, that:

- the service standard benchmark is only one of a number of measures of Western Power's service delivery commitments and obligations; and

- the costs associated with meeting all of the company's service delivery commitments must be fully reflected in Western Power's expenditure plans.

3.7 Concluding comments

It is considered that the proposed suite of supply reliability and circuit availability measures provide effective service standard benchmarks for reference services which satisfy the Code requirements of being reasonable and understandable by customers. The proposed service standard benchmarks are also commensurate with the company's proposed expenditure programs and the significant service improvements that these expenditure programs are expected to deliver. The company's proposal to use the service standard benchmarks in a service standards adjustment mechanism will, along with other measures proposed in the access arrangement, provide clear incentives for the company to deliver its planned service performance improvements.

4 Design of price controls

4.1 Introduction

This section sets out detailed information to substantiate and explain the basis of the arrangements proposed by Western Power in relation to the target revenue and price control requirements set out in section 6 of the Code. Accordingly, this section provides information on:

- the proposed form of price control;
- mechanisms for adjustment of target revenue for unforeseen events in accordance with sections 6.6 to 6.8 of the Code;
- mechanisms for adjustment of target revenue for technical rule changes in accordance with sections 6.9 to 6.12 of the Code;
- the operation of the investment adjustment mechanism (provided for in sections 6.13 to 6.18 of the Code);
- the gain sharing mechanism (provided for in sections 6.19 to 6.28 of the Code); and
- the service standards adjustment mechanism (provided for in sections 6.30 to 6.32 of the Code).

This section also explains the way in which the X factors applying in the transmission and distribution price control formulae are calculated.

4.2 Form of price control

4.2.1 Code provisions

Section 6.2 of the Code states:

> "Without limiting the forms of *price control* that may be adopted, *price control* may set *target revenue*:
>
> (a) by reference to the *service provider's approved total costs*; or
>
> {Note: This includes "revenue cap" *price controls* based on controlling total revenue, average revenue or revenue yield and "price cap" *price controls* based on cost of service.}
>
> (b) by setting *tariffs* with reference to:
>
> (i) *tariffs* in previous *access arrangement periods*; and
>
> (ii) changes to costs and productivity growth in the electricity industry;
>
> {Note: This includes "price cap" *price controls* based on controlling the weighted average of *tariffs* or individual *tariffs*.}
>
> or
>
> (c) using a combination of the methods described in sections 6.2(a) and 6.2(b)."

Notwithstanding the provisions cited above, section 6.3 states:

"The *first access arrangement* must contain the form of *price control* described in section 6.2(a)."

4.2.2 Alternative price control forms

There are three basic forms of price control which could be adopted, and which would be likely to meet the requirements of the Code. These are:

1. a "tariff basket" (or weighted price cap);

2. a pure revenue cap; and

3. a revenue yield control.[50]

Variations and hybrids of these basic forms of control have been adopted in a number of Australian jurisdictions. For instance:

- Western Power's transmission and distribution network businesses are presently subject to an average revenue yield form of control;

- electricity and gas distributors in Victoria are presently subject to a "tariff basket" form of control;

- the draft decision on electricity distribution price controls for 2005 to 2010 published recently by the Essential Services Commission of South Australia proposes the application of an average revenue yield form of control;

- electricity transmission companies that are regulated by the ACCC under the National Electricity Code are subject to a revenue cap form of control.

4.2.3 Assessment of alternatives

Over recent years, there has been a good deal written about the merits of different forms of price controls.[51] Each alternative form has its relative merits and weaknesses, and there is no "first best" or "correct" form of control. (For this reason, section 6.2(a) of the Code provides for a range of different forms of control to be incorporated into Western Power's access arrangement.)

One of the most important factors that have been raised by regulators in considering the merits of different price control forms is the extent to which businesses face risks that are difficult to manage due to demand forecast errors. In this context, it is noteworthy that the Victorian ESC has been at the forefront of advocating the use of a tariff basket form of control in the distribution sector, for reasons that relate to, among other things:

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50 A "rate of return" form of control, in which regulated companies are essentially permitted to recover all "prudently incurred" costs, plus a regulated rate of return, is widely regarded as providing insufficient incentives for efficient investment in and operation of regulated infrastructure. On this basis, the "rate of return" form of control is unlikely to be deemed to meet the Code objective, and therefore Western Power has not included this form of control for consideration in this discussion.

51 A number of consultation papers, and draft and final decisions published by the Victorian Essential Services Commission (and its predecessor, the Office of the Regulator-General), the Queensland Competition Authority and the Independent Pricing and Regulatory Tribunal of NSW have addressed this issue in detail.

- minimising the impact of demand forecast errors on company revenues and profits; and

- minimising the incentives and opportunities for regulated companies to engage in "gaming" activities that aim to increase company profits.

The ESC's predecessor (the Office of the Regulator-General) advanced strong conceptual arguments to justify the application of the tariff basket price control form to Victorian electricity distributors at the last price determination (in 2001).[52] However, in the course of the five-yearly electricity distribution price review which is now underway in Victoria, the ESC has recently observed that:

> "Tariff revenue for the 2001-03 period exceeded the benchmark level by 7.3 per cent, due to a combination of distributed energy being higher than forecast and the restructuring of tariffs in a manner that caused revenue to be higher than forecast for any given volume growth, for example, by increasing the variable component of charges by a greater amount than the fixed component. The Commission's preliminary analysis suggests the latter had the more important effect."[53]

Reading between the lines, it would not be unreasonable to infer that the ESC's observation reflects some frustration that in practice, the results delivered under the tariff basket control form have not met the regulator's expectations. Not surprisingly, these observations suggest that approaches (such as the tariff basket form) which appear to have strong merit "on paper" will not necessarily perform in accordance with expectations *in practice*. On this basis, Western Power considers there are good grounds to be sceptical about the benefits *in practice* that the tariff basket price control form is likely to have over the revenue yield control which is presently applied to the company.

The other broad alternative form of price control is a revenue cap. Under a pure revenue cap, a regulated company is permitted to earn a specified level of income, regardless of the volumes of energy transmitted over its infrastructure. In its examination of different forms of price controls, the Office of the Regulator-General stated:

> "Under a pure revenue cap, the licensee retains an incentive to minimise the cost of providing distribution services, since allowed revenue will remain unaffected, resulting in improved profitability.
>
> Completely severing the link between allowed revenue and volume may however lead to a deterioration in the licensees' willingness to expand distribution services to both new and existing consumers. Distribution licensees may be reluctant to attract new consumers within a specific price control period, since to do so would imply an increase in costs without a corresponding increase in allowed revenue. Some formulations of a pure revenue control try and compensate for this incentive effect by linking the allowed revenue to the number of customers. However, licensees still retain an incentive to minimise the volume distributed to each customer, providing that the marginal cost of additional load distribution is non-zero.
>
> Whilst such an incentive is broadly compatible with demand management objectives and may move towards meeting greenhouse gas emissions targets, the incentives to

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52 See, for instance, the Office of the Regulator-General, *Consultation Paper no. 3 - 2001 Electricity Distribution Price Review: The form of price control.*

53 Essential Service Commission, Position Paper: Electricity Distribution Price Review, 2006-10, March 2005, page 11.

> reduce load under a pure revenue cap may be artificially strong. Licensees may reduce demand beyond the point where this is efficient. There may also be an incentive to be less vigilant about network reliability standards, such as minutes of lost supply."[54]

Western Power broadly concurs with this assessment. Moreover, the company notes that in the transmission sector, practical experience in the application of revenue caps under the National Electricity Code is now also revealing challenges and limitations with that form of control. In particular, the issues arising from the mismatch between costs and revenues over a regulatory period (due principally to demand forecast errors), and mechanisms for dealing with the uncertainty associated with large, "lumpy" customer-initiated transmission investment appear to be among the most problematic. Over the course of the recent review of its Statement of principles for the regulation of electricity transmission revenues (the "regulatory principles") the ACCC has proposed various alternative changes to arrangements to address these issues.

After considerable debate, the ACCC issued a Final Decision (in December 2004) on its regulatory principles. However, it is understood that there remain a number of detailed implementation issues that must be resolved to ensure that when the regulatory principles are applied, they deliver a revenue cap framework which:

- provides an effective incentive-based regime; and which
- facilitates effective management of issues associated with forecast errors, and the uncertainty associated with large scale customer-initiated investment.

Again, experience suggests that a good deal of caution should be applied in forming a view as to the likely benefits to be achieved in practice by moving away from the established revenue yield control to a revenue cap.

Another important consideration is the question of the time, effort and resources that would be involved in moving away from an established and well understood price control arrangement (the revenue yield) to an untested alternative form. Western Power's experience suggests that like the alternatives, the revenue yield control is not without its problems and limitations. Principally however, these limitations are common to all incentive-based price control forms; as already noted, they relate mainly to the impact of demand forecast errors, and the difficulties associated with predicting the timing and location (and hence cost) of certain large scale customer-initiated transmission investments.

Western Power considers that these limitations can be addressed under the present revenue yield form of control (which does provide a level of revenue that is a function of the volume of energy throughput), as follows:

- Issues associated with demand forecast error can be mitigated by adopting a robust and rigorous approach to demand forecasting as part of preparing the access arrangement. As noted in Parts B and C of this access arrangement information, Western Power has adopted such an approach in developing its demand forecasts for the transmission and distribution activities.

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[54] Office of the Regulator-General, *Consultation Paper no. 3 - 2001 Electricity Distribution Price Review: The form of price control*, page 18.

- Issues associated with the costs of unforeseen "lumpy" customer-initiated transmission investment can be managed by incorporating provisions in the access arrangement that allow for the adjustment of revenues to recover certain unforeseen costs. These provisions are outlined in detail in section 4.5 of this submission below.

A further relevant consideration is the relatively short (three-year) duration of the first access arrangement period.[55] The scope for Western Power's total costs and revenues to diverge materially as a result of demand forecast error over this period is low, compared to the potential for such outcomes to arise over a longer period. This suggests that there is a low risk of systematically higher or lower profits occurring within the first access arrangement period due to forecast error under a revenue yield control.

4.2.4 Economic characteristics of the revenue yield price control form

As noted elsewhere, the amount of revenue collected by the company under its present revenue yield price control is a function of actual energy volumes transported across the networks. Hence, there is a correlation between the company's output, its revenue and, to a lesser extent, its costs. Applying this form of price control in accordance with the provisions of Chapter 6 of the Code:

- the target revenue will be determined on the basis of a forecast of the efficient capital and non capital costs that will be incurred in producing the company's planned customer service outcomes for the access arrangement period; however

- the actual revenue that the company is permitted to collect will reflect the volume of services delivered by the company, but actual revenue will largely be independent of the costs actually incurred by the company in delivering its services.

The de-coupling of the company's actual costs from its actual revenue in this manner provides strong incentives for the company to achieve efficiency gains, while the service incentive arrangements described in section 4.8 of this Part D, together with the service standard benchmarks and Western Power's other commitments and obligations regarding service delivery[56] provide safeguards against the prospect of the company achieving cost savings and higher profits at the expense of customer service standards.

4.2.5 Selection of proposed price control form

Having regard to all of the above considerations, Western Power proposes to continue to apply a revenue yield form of price control for the first access arrangement period. In making this proposal, Western Power also notes that there has been very limited time available to assess in detail the merits of moving to an alternative (and untested) form. Notwithstanding the foregoing discussion, the continuation of the present arrangements therefore also entails substantial advantages, since:

- all stakeholders are already familiar with the operation of the control;

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55 Section 5.30(b) states that for the *first access arrangement period*, the target *revisions commencement date* must be no more than 3 years after the *access arrangement start date*.

56 Refer to section 3 of this Part D for details.

- all the key systems and processes required to implement and administer the control are already ostensibly in place and are operational; and

- the costs and risks of migrating to a new (and untested) set of price control arrangements are avoided.

On this basis, Western Power considers there are sound reasons to continue to apply a revenue yield form of price control for the first access arrangement period. The company suggests that the access arrangement review scheduled to occur at the end of the first access arrangement period will provide a good opportunity to review the performance of the revenue yield control over the preceding access arrangement period, and to conduct a more thorough analysis of alternatives, if this is considered necessary at that time. Any changes to the price control form could therefore be implemented in an orderly way from the commencement of the second access arrangement period.

4.3 Adjusting target revenue for unforeseen events

4.3.1 Code provisions

Sections 6.6 to 6.8 inclusive set out provisions which, under certain circumstances, enable Western Power to include in its *target revenue* for the next *access arrangement period* unforeseen costs which were incurred during the previous *access arrangement period* as a result of a *force majeure* event.

Under section 6.7 of the Code, there is no guarantee that the company will be able to recover all (or even any) of the costs actually incurred as a result of a force majeure event. In any event, section 6.8 limits the amount that can be recovered to an amount not exceeding the costs which would have been incurred by a *service provider efficiently minimising costs*.

4.3.2 Western Power's proposed approach

Where it is possible to do so, Western Power will continue to purchase insurance of a standard of a reasonable and prudent person (as to the insurers and the type and level of insurance) in relation to force majeure events.

Where commercial insurance is either unavailable or prohibitively expensive, Western Power has the option of either:

- self-insuring against the force majeure risk, and having a "self insurance" premium included in the forecast non capital costs component of its target revenue for the duration of the access arrangement period; or

- relying on the provisions for recovery of unforeseen costs – after a force majeure event has occurred – in accordance with the provisions set out in sections 6.6 to 6.8 inclusive.

Broadly speaking, there is a limited data set available on which to assess the actuarial fair value of certain force majeure events. As a consequence, Western Power would face a potentially very high risk if it self insured against such events.

As a matter of principle therefore, Western Power prefers to rely on the provisions set out in sections 6.6 to 6.8 inclusive to recover any unforeseen costs it incurs as a result of force majeure events.[57]

Western Power considers that the provisions set out in sections 6.7 and 6.8 of the Code are intended to provide the company with strong incentives to efficiently manage the company's exposure to force majeure risk. Hence, the reliance of the company on cost pass-through provisions will not dilute the incentives faced by the company to actively manage all of its risk exposures.

4.4 Adjusting target revenue for technical rule changes

4.4.1 Code provisions

Sections 6.9 to 6.12 inclusive set out provisions which enable Western Power to include in its *target revenue* for the next *access arrangement period* unforeseen costs (or savings) which occurred during the previous *access arrangement period* as a result of a change in costs arising from a change in the *technical rules*.

Under sections 6.11 and 6.12 of the Code, the amount by which the *target revenue* for the next *access arrangement period* is to be adjusted for unforeseen cost changes is to be consistent with the levels of costs that would have been incurred by a *service provider efficiently minimising costs*.

4.4.2 Western Power's proposed approach

For a detailed exposition of Western Power's proposed approach please refer to Appendix 7 of the access arrangement.

4.5 Investment adjustment mechanism

4.5.1 Code provisions

Section 6.13 defines investment adjustment mechanism as:

> "a mechanism in an access arrangement detailing how any investment difference for the access arrangement period is to be treated by the *Authority* at the next access arrangement review."

Section 6.14 states:

> "In sections 6.13 and 6.16, "investment difference" for an access arrangement period is to be determined at the end of the access arrangement period by comparing:
>
> (a) the nature (including amount and timing) of actual new facilities investment which occurred during the access arrangement period;
>
> with

[57] Where the company does seek a self-insurance provision in its target revenue, the relevant self-insured risk will be clearly identified in parts B and C (as applicable) of this access arrangement information, to ensure that the company cannot be compensated twice for such costs.

(b) the nature (including amount and timing) of forecast new facilities investment which at the start of the access arrangement period was forecast to occur during the access arrangement period."

Section 6.15 specifies that:

"If an access arrangement uses the form of price control described in section 6.2(a), then the access arrangement must contain an investment adjustment mechanism."

However, section 6.16 states:

"Without limiting the types of investment adjustment mechanism which may be contained in an access arrangement, an investment adjustment mechanism may provide that:

(a) adjustments are to be made to the target revenue for the next access arrangement in respect of the full extent of any investment difference; or

(b) no adjustment is to be made to the target revenue for the next access arrangement in respect of any investment difference."

Section 6.17 states:

"An investment adjustment mechanism must be:

(a) sufficiently detailed and complete to enable the *Authority* to apply the *investment adjustment mechanism* at the next *access arrangement review*;

and

(b) without limiting this Code, consistent with the *gain sharing mechanism* (if any) in the *access arrangement*;

(c) consistent with the *Code objective*."

Finally, section 6.18 states:

"An *investment adjustment mechanism* in an *access arrangement* applies at the next *access arrangement review*."

4.5.2 Applying the principles implicit in the Code provisions

An effective price control must:

- provide incentives to Western Power to operate and invest efficiently; and
- provide reasonable certainty to Western Power of recovering all of the costs of uncertain (and often large-scale) customer-initiated transmission investment.

There is, however, a trade-off between providing incentives for efficiency on the one hand, and certainty of cost recovery on the other. Given this consideration, a key characteristic of Western Power's proposed price control is that the company's actual revenues will generally not be adjusted within the access arrangement period to reflect the costs actually incurred by the company in delivering its services to customers.

In considering the question of defining the situations in which the investment adjustment mechanism might apply, the following points are relevant:

- It is neither necessary nor appropriate for capital expenditure related to organic load growth, including network reinforcement to be subject to an investment adjustment mechanism. Such expenditure is forecast to meet network planning criteria and forecast load growth. Under the proposed form of price control to be applied (average revenue yield), the financial impacts for Western Power and its customers arising from forecast errors in these areas are unlikely to be substantial.

- Similarly, to ensure the preservation of incentives for efficient expenditure, it is neither necessary nor appropriate for capital expenditure related to asset renewals and replacement to be subject to an investment adjustment mechanism.

- The one category of capital expenditure that is very uncertain (and therefore very difficult to forecast) is that related to new transmission-connected generation and the connection of large loads. Under the newly established electricity market, new generation investment is undertaken by investors responding to price signals in the wholesale electricity market. The network business is a full participant in the planning process for new generation, but it does not participate in the decision to proceed. The same is true of connections by large customers. Forecasts of expenditure in this particular category can only be based on the (sometimes very limited) information at hand and on the relative probability of projects proceeding.

4.5.3 Western Power's proposed approach

On the basis of the foregoing discussion, it is proposed to split the transmission capital expenditure forecasts into three categories, as follows:

1. Capital expenditure remunerated through the target revenue, related to:

    - asset replacement and renewals;

    - network reinforcement; and

    - any capital expenditure directly or indirectly related to the connection to the transmission network of new generation projects and customers which have been announced or committed as at 1 August 2005.

    This category of expenditure is included within the normal capital expenditure forecasts and will not be subject to an investment adjustment mechanism.

2. Expenditure related to transmission network reinforcement and transmission connection of new, as yet uncommitted or unplanned generation and customers connecting to the transmission network. This category of expenditure will be subject to the investment adjustment mechanism. The target revenue for the first access arrangement period will include a forecast of expenditure for projects in this category based on a probability-weighted value derived from different credible network development scenarios.

The investment adjustment mechanism will apply in the next access arrangement period to reflect the difference between actual and forecast capital expenditure that

falls within the second category described above. A list of capital works that are dependent on as yet uncommitted generation or customer transmission connections are provided in Appendix 8 of the access arrangement. For more details of the investment adjustment mechanism, please refer to the access arrangement.

Finally, it should be noted that Western Power does not propose to seek any adjustment to the target revenue in respect of any investment difference relating to distribution network capital expenditure for the first access arrangement period.

4.6 Gain sharing mechanism

4.6.1 Code provisions

A gain sharing mechanism is defined in sections 6.19 and 6.21 as a mechanism in an access arrangement which is applied at the next access arrangement review to determine an amount to be included in the target revenue for one or more of the following access arrangement periods, and which has the objectives of:

- giving the service provider an incentive to reduce costs or otherwise improve productivity in a way that is neutral in its effect on the timing of such initiatives; and

- achieving an equitable allocation over time between users and the service provider of innovation and efficiency gains achieved by the service provider.

Section 6.20 states:

> "An *access arrangement* must contain a *gain sharing mechanism* unless the *Authority* determines that a *gain sharing mechanism* is not necessary to achieve the objective in section 6.4(a)(ii)."

4.6.2 Western Power's proposed approach

In recent years, there has been considerable debate and discussion throughout Australia regarding the design and application of incentive mechanisms in infrastructure regulation. Many Australian regulators now apply some form of mechanism that seeks to achieve the objectives set out in section 6.21 of the Code.

Western Power acknowledges and recognises the important role that such incentive mechanisms have to play in fostering efficient behaviour within established regulatory regimes. However, the design and implementation of such mechanisms is not a straightforward matter[58] and, arguably, developing and implementing a gain sharing mechanism at this time could inappropriately divert management resources away from service delivery imperatives.

It is also worth noting that this submission explains in detail that Western Power must substantially increase network investment and operating expenditure to deliver the level of service that customers rightly expect. The submission also highlights the challenges that Western Power must address in order to ramp-up expenditure over the forthcoming access arrangement period. In short, Western Power expects to face a number of resource-constraints in meeting its service objectives.

[58] As illustrated by the Discussion Paper published by the Authority in March 2004, titled *Incentive mechanisms for Code regulated gas pipeline systems.*

Against this background, Western Power's view is that a gain-sharing mechanism is not appropriate at this time. In particular, whilst Western Power intends to achieve efficiency improvements over the forthcoming period, it may be counter-productive for the access arrangement to over-emphasise the importance of under-spending against benchmark levels. It seems more appropriate to introduce a gain-sharing mechanism once expenditure levels reach a 'steady-state'.

In any event, it is worth noting that Western Power will face significant pressure to improve performance over the forthcoming period. This submission explains some of the measures that have already been put in place to drive better service delivery at lower cost. The company fully expects its shareholder, customers and management team to continue to drive performance improvement initiatives during the first access arrangement period. These pressures on performance will remain in play, even in the absence of a formal gain-sharing mechanism.

It is also noted that the disaggregation of Western Power into four independent business units is likely to create cost uncertainty and change-management challenges in the forthcoming access arrangement period. These issues add further weight to Western Power's view that a strong focus on reducing operating and capital expenditure below the benchmark level may not be appropriate at this time.

In view of all of these considerations, Western Power proposes not to include a gain sharing mechanism in its access arrangement for the first access arrangement period, on the basis of its reasonable expectation that pursuant to the provisions set out in section 6.20 of the Code, the Authority will determine that a gain sharing mechanism is not necessary at this time to achieve the objective in section 6.4(a)(ii).

It is suggested that the conduct of the next access arrangement review will present a timely opportunity to review in greater detail the need for, and design alternatives of a gain sharing mechanism that could be applied from that time.

An important aspect of the design of a gain sharing mechanism is the establishment of efficiency and innovation benchmarks. The Code requirements relating to these benchmarks, and Western Power's proposed approach are discussed in detail in the next section.

4.7 Efficiency and innovation benchmarks

4.7.1 Code provisions

Code provisions governing the establishment of efficiency and innovation benchmarks are closely related to those that govern the design of a gain sharing mechanism. The applicable provisions are set out in sections 5.25 and 5.26 as follows:

> 5.25 An access arrangement which contains a gain sharing mechanism must, and an access arrangement which does not contain a gain sharing mechanism may, contain efficiency and innovation benchmarks.
>
> 5.26 Efficiency and innovation benchmarks must:
>
> (a) if the access arrangement contains a gain sharing mechanism, be sufficiently detailed and complete to permit the *Authority* to make a determination under section 6.25 in the next access arrangement review, and

(b) provide an objective standard for assessing the service provider's efficiency and innovation during the access arrangement period, and

(c) be reasonable.

4.7.2 Western Power's proposed approach

As noted in section 4.6 above, Western Power does not propose to include a gain sharing mechanism in its access arrangement for the first access arrangement period. In accordance with this proposal, the company also proposes to not include efficiency and innovation benchmarks in this access arrangement.

As already noted however, the company does consider it would be appropriate to conduct a thorough assessment of the need for, and the design options for a gain sharing mechanism at the next access arrangement review. To ensure that the company is well positioned to participate constructively in such a review, Western Power undertakes to establish, during the course of the first access arrangement period, data collection and performance monitoring processes to facilitate the development of appropriate efficiency and innovation benchmarks that would apply from the commencement of the second access arrangement period. The company anticipates that these benchmarks will be included in the access arrangement to apply during the second access arrangement period, and would be adopted for the purpose of any gain sharing mechanism which may apply during that access arrangement period.

4.8 Service standards adjustment mechanism

4.8.1 Code provisions

The applicable Code provisions are as follows:

6.29 A **"service standards adjustment mechanism"** is a mechanism in an *access arrangement* detailing how the *service provider's* performance during the *access arrangement period* against the *service standard benchmarks* is to be treated by the *Authority* at the next *access arrangement review*.

6.30 An *access arrangement* must contain a *service standards adjustment mechanism*.

6.31 A *service standards adjustment mechanism* must be:

(a) sufficiently detailed and complete to enable the *Authority* to apply the *service standards adjustment mechanism* at the next *access arrangement review*; and

(b) consistent with the *Code objective*.

6.32 A *service standards adjustment mechanism* in an *access arrangement* applies at the next *access arrangement review*.

4.8.2 Principles guiding the design of the mechanism

In Western Power's view, two primary objectives for establishing financial incentives through the service standard adjustment mechanism (SSAM) are:

- to encourage Western Power to achieve, or exceed, the service standard benchmarks for reference services; and

- to ensure that the incentives for Western Power to improve service performance (where that is economically efficient) are not outweighed by the incentives to reduce expenditure inherent in the CPI-X regulatory regime.

The principles that Western Power has adopted to further guide the design of the SSAM are as follows:

1. The incentive mechanism should be as simple as possible to understand for both Western Power and customers, without unduly distorting the incentives.

2. Western Power should be fairly rewarded for its efforts in delivering service improvements, and ideally should not be affected financially for impacts on performance that are beyond its reasonable control. In particular, Western Power should be economically neutral under the SSAM if its actual performance over the access arrangement period is consistent with the service standard benchmarks.

3. The incentives should be specified clearly and in advance, to maximise their effectiveness.

4. The incentives should be based on reliable and verifiable performance measures.

5. The incentive arrangements should encourage improvements for urban and rural customers, noting that these groups of customers presently receive (and expect) different levels of service.

6. The incentives should encompass both penalties for sub-standard performance and rewards for superior performance.

7. The amount of revenue that Western Power stands to gain or lose under the incentives should be limited, but large enough to provide meaningful commercial incentives at the margin. It is desirable, but not essential, that the amount of the incentives should be greater than the cost to Western Power of achieving an increment of reliability, but less than the value that customers place on that increment of reliability.

8. The incentive arrangements should be appropriately balanced across the distribution and transmission systems.

9. Future service standard benchmarks should be set to ensure that Western Power retains a fair share of the benefit that customers are estimated to derive from service improvements.

These principles are generally consistent with those applied by the ACCC in the development of its Service Standards Guidelines (which form part of its Statement of Regulatory Principles). The principles are also broadly consistent with those that form the basis of the service incentive mechanism (“S factor”) applied by the Essential Services Commission to Victorian electricity distributors.

It is noted that these principles can only provide a broad guide to the design of the SSAM. To an extent, the requirements of at least some of these principles are in conflict with one another. It is therefore not possible, for example, to precisely meet the requirements of each and every principle. In some circumstances, it will be necessary to trade-off one principle against another. For example, it may not be

possible to meet entirely the objectives of (1) simplicity and (2) ensuring that Western Power should not be unfairly penalised or rewarded for impacts on performance that are beyond its reasonable control.

It is clear from section 6.29(a) of the Code that the SSAM entails a comparison of Western Power's performance against the service standard benchmarks. In sections 3.4 and 3.5 of this Part D, Western Power describes its service standard benchmarks for the transmission and distribution networks respectively. Importantly, the service standard benchmarks reflect:

- the service improvements that Western Power's expenditure plans should deliver during this access arrangement period (consistent with principle 2);
- the availability of reliable and verifiable performance measures (consistent with principle 4); and
- the range of services that customers receive depending on their location (consistent with principle 5).

4.8.3 Setting the incentive parameters

In setting the incentive parameters to apply in the SSAM, five key issues must be addressed. These are:

- determining the limits on the extent of Western Power's financial exposure (in terms of revenue at risk) under the SSAM;
- allocating the revenue at risk between:
    - the transmission reference services; and
    - the services provided to users connected to the distribution network;
- allocating the revenue at risk in each of these two categories between each individual service standard benchmark within each category;
- determining a "dead-band" that applies around the service standard benchmark for the purpose of rewarding or penalising variations in performance relative to the service standard benchmark; and
- calibrating the incentive rate, with reference to the 'best' and 'worst' performance levels that would be likely to trigger the maximum bonus and penalty payments (respectively) in any year.

Each of these issues is discussed in further detail in the sections below.

4.8.4 Determining reasonable limits on Western Power's financial exposure

There are sound reasons for limiting Western Power's financial exposure under the SSAM[59]. Principally, these relate to:

[59] A discussion of issues relating to the exclusion of certain events – such as force majeure -from the SSAM is set out in section 4.8.7 below.

- the asymmetry of the potential outcomes that might arise if Western Power's financial exposure under the mechanism is unlimited;

- the novelty of the SSAM, and hence the inherent uncertainty associated with the outcomes that may be delivered under the operation of the SSAM; and

- the difficulties in practice under the scheme of shielding Western Power from the financial impacts of events that are beyond the company's reasonable control.

In view of these considerations, Western Power has looked to the ACCC's experience in order to guide the determination of an appropriate level of revenue at risk under a service incentive scheme. In this regard, it is noted that in its December 2002 revenue cap determination for SPI PowerNet, the ACCC stated:

> "Linking the level of service to financial incentives was done by selecting an appropriate percentage of the AR [annual revenue] that SPI PowerNet can gain or forfeit depending on the performance it achieves. The Commission considers that a one per cent increase in the AR (per annum) would provide a large enough incentive for the TNSPs to maintain or improve their current level of service. Further, a one per cent decrease in the AR would strengthen the TNSP's incentive to avoid deterioration of their current level of service. The Commission considers that the potential loss of one per cent of its AR will not subject SPI PowerNet to extra material risk."

In November 2003 the ACCC confirmed its approach to limiting the financial exposure of regulated companies under service its incentive scheme in its Service Standards Guidelines, which now form part of the ACCC's Statement of Regulatory Principles. Page 10 of the guidelines states:

> "The ACCC has decided to initially cap the financial incentives available from achieving performance targets to ±1 per cent of the TNSP's revenue-cap. As the incentive scheme is in the early stage of development, the ACCC is cautious about exposing TNSPs and customers to excessive risk and uncertainty."

On this basis, Western Power's view is that the application of the SSAM should be capped to ±1 per cent of the company's total revenue from covered services.

4.8.5 Allocation of revenue at risk between reference service groups

Having determined the total amount of revenue at risk under the SSAM, a decision must be made about allocating that total amount between the transmission reference services and the reference services provided to users connected to the distribution network.

The total revenue at risk can be allocated on the basis of a number of alternative approaches, such as:

- the relative size of the annual revenues of the transmission and distribution businesses;

- the relative size of the asset bases of the two networks; or

- to maximise customer benefit (whereby a greater proportion of the revenue at risk would be allocated to those performance parameters that deliver the highest customer benefit).

Western Power considers that given the novelty of the SSAM, the most appropriate approach is to allocate the revenue at risk on the basis of relative size of the annual revenues of the transmission and distribution businesses (being approximately $260 million and $400 million respectively). This allocation is also consistent with maximising customer benefit, since planned improvements in the reliability of the distribution network over the forthcoming access arrangement period are expected to contribute much of the service improvements (as measured by SAIDI) that Western Power has committed to delivering.

On this basis, the total revenue at risk allocated to the distribution and transmission service standard adjustment mechanisms is approximately $2.6 million and $4 million respectively.

The revenue at risk allocated to the transmission and distribution SSAMs must then be allocated to each individual performance measure. Decisions involving the allocation of revenue at risk among each service standard benchmark have been guided by considerations that are consistent with those used to allocate the total revenue at risk between the transmission reference services and the reference services provided to users connected to the distribution network. Further details are set out in section 4.8.9 below.

4.8.6 Specification of a dead-band

A dead-band sets a performance tolerance around the service standard benchmark within which no revenue adjustment is made either way. The purpose of the dead-band is to eliminate random factors (such as normal weather variability) that do not reflect underlying changes in performance.

The dead-band plays a similar role to 'exclusions', although there remains a need to specify exclusions where random events beyond the company's reasonable control have a potentially very large impact. In this context, it is noted that the metrics applied in the service standard benchmarks provide for the measurement of performance after certain defined events are excluded.

The dead-band is determined with reference to historic data on performance (to remove the impacts of random events). Further details are set out in section 4.8.8 (reference services for users connected to the distribution network) and section 4.8.9 (transmission reference services).

4.8.7 Setting the incentive rate

The incentive rate applied for each service standard benchmark performance measure is derived from an analysis of the 'best' and 'worst' performance levels[60] that would be likely to trigger maximum bonus and penalty payments within the global constraints of plus and minus 1% of total annual revenue, respectively.

For each service standard benchmark, an incentive rate has been derived so that if performance in a year is at the extreme end of the range of possible outcomes (ie best and worst), then all the attainable bonus or penalty is applied.

For performance outside this maximum range, no further bonus or penalty is applicable.

[60] Established with reference to recent actual performance data.

4.8.8 Service standards adjustment mechanism: Services for distribution-connected users

As explained in section 3.5 of this Part D, Western Power proposes that the following measures of service standard benchmarks apply to reference services for users connected to the distribution network:

- SAIDI for Urban sub-networks; and
- SAIDI for Rural sub-networks.

Section 4.8.6 above notes the need for consideration to be given to the weight to be applied to each of these performance measures, to reflect the significance of that measure in terms of overall performance.

The SAIDI measure is a direct indicator of the standard of service that all customers actually receive. However, the vast majority of customers reside in the urban area, and are connected to the Urban network, as shown in Table 29 below:

Table 29: Composition of customer base, by network type

Network type	Customer Numbers	Percentage of total
Urban	711,515	86%
Rural	115,178	14%
Total SWIS	826, 693	100%

Given the geographic location of customers across the Urban and Rural networks, it is considered appropriate to allocate the distribution revenue at risk in the SSAM between the Urban and Rural indicators in direct proportion to the customer numbers.

Table 30 below summarises the rationale underpinning the Western Power's determination of the upper and lower limits, and the deadband for each of the two performance measures within the distribution SSAM.

Table 30: Rationale underpinning upper and lower limits, and the deadband of the distribution SSAM

Performance measure: SAIDI - Urban	The limits of the deadband are set at 10% above and below the service standard benchmark. This is considered reasonable to allow for the fluctuations in performance due to normal variations in weather. These limits are similar to those used for other distribution service providers with similar incentive schemes, notably ETSA Utilities. The limits at which a full reward or penalty would be applied are set at a further 10% above and below the deadband limits.
Performance measure: SAIDI – Rural	As for SAIDI - Urban

Table 31 below lists the upper and lower limits, the deadbands and the incentive rates for each of the distribution service standard benchmark performance measures.

Table 31: Distribution service standard adjustment mechanism limits and incentive rates

		Low Limit	Deadband			High Limit	Incentive Rate ($ per SAIDI minute)
			Lower bound	Target	Upper bound		
SAIDI - Urban (Minutes)	2006/07	194	218	242	266	290	$161,000
	2007/08	181	203	226	249	271	$186,000
	2008/09	156	176	195	215	234	$225,000
SAIDI - Rural (Minutes)	2006/07	407	458	509	560	611	$12,300
	2007/08	381	428	476	524	571	$14,200
	2008/09	328	369	410	451	492	$17,000

The service standard adjustment mechanism will operate as follows:

- The reward or penalty applicable under the SSAM shall be calculated once for each year of the access arrangement period as: the incentive rate multiplied by the difference between the actual performance and the service standard benchmark (denoted as "Target" in Table 31 above), only where actual performance[61] is between:
    - the "Low Limit" and the "Lower bound" of the Deadband shown in table 31 above; or
    - the "High Limit" and the "Upper bound" of the Deadband shown in table 31 above.

The present value as at the access arrangement review date[62] of the annual SSAM reward or penalty calculated for each year of the first access arrangement period will be included in the determination of Western Power's target revenue for the second access arrangement period.

4.8.9 Service standards adjustment mechanism – Transmission

As explained in section 3.4 of this Part D, Western Power proposes the following measures of service standard benchmarks for transmission reference services under the access arrangement:

[61] Western Power's actual performance will be calculated on the basis of the service standard definitions in section 3.4.3.

[62] The present value of such amounts will be calculated using the WACC which applies in the first access arrangement period.

- System Minutes Interrupted (for meshed circuits only); and
- Circuit Availability.

Section 4.8.6 above notes the need for consideration to be given to the weight to be applied to each of these performance measures, to reflect the significance of that measure in terms of overall performance.

Circuit Availability includes outages which may be planned prudently and efficiently. While the actual service standard a customer experiences may not be affected by such outages, Circuit Availability nonetheless provides a good measure of the inherent reliability of the network. Moreover, many of the events that affect availability are within the reasonable control of Western Power.

The System Minutes Interrupted measure, on the other hand, is a direct indicator of the standard of service that a substantial number of customers actually receive.

Having regard to these considerations, it is considered these two indicators are of similar significance and should be weighted equally in the SSAM.

Table 32 below summarises the rationale underpinning the Western Power's determination of the upper and lower limits, and the deadband for each of the two performance measures.

Table 32: Rationale underpinning upper and lower limits, and the deadband of the transmission SSAM

Performance measure: Circuit Availability	The potential impact on Circuit Availability of an outage on a circuit element for 12 months is approximately 0.5%. The transmission capital investment plan includes an increase in major line works which is likely to require prolonged outages (e.g. several months) on some line circuits. Therefore, the lower boundary of the deadband is set at 0.5% less than the service standard benchmark (which in turn, is based on historical average performance) to allow for such planned outages without financial penalty. The low limit at which the full revenue penalty would be incurred is set a further 0.5% lower. To provide symmetry, the upper limit of the deadband is set 0.5% above the service standard benchmark and the limit at which the full reward will be received is set a further 0.5% higher. It is noted that the probability of achieving the full reward available in any given year is extremely low, given general levels of circuit access required for planned maintenance programmes.
Performance measure: System Minutes Interrupted (meshed network)	The limits of the deadband correspond to the lowest and highest actual performance over the last 5 year period. Given the low contribution to overall reliability experienced by customers, recent and current performance is considered to be satisfactory and there is no strong driver to either improve or relax performance. With the deadband limits representing the bounds of expected future performance, it is appropriate that the limits for incurring a financial penalty or gain should be relatively narrow

Table 33 below lists the upper and lower limits, the deadbands and the incentive rates for each of the transmission service standard benchmark performance measures.

Table 33: Transmission service standard adjustment mechanism limits and incentive rates

	Low Limit	Deadband			High Limit	Incentive Rate
		Lower bound	Target	Upper bound		
Circuit Availability (%)	97.6%	98.1	98.6	99.1	99.6	$269,000 per 0.1% circuit availability
System Minutes Interrupted (meshed network)	4.8	5.8	8.3	10.8	11.8	$134,000 per 0.1 System Minute Interrupted

The service standard adjustment mechanism will operate as follows:

- The reward or penalty applicable under the SSAM shall be calculated once for each year of the access arrangement period as: the incentive rate multiplied by the difference between the actual performance[63] and the service standard benchmark (denoted as "Target" in Table 33 above), only where actual performance is between:
    - the "Low Limit" and the "Lower bound" of the Deadband shown in table 33 above; or
    - the "High Limit" and the "Upper bound" of the Deadband shown in table 33 above.
- The present value as at the access arrangement review date[64] of the annual SSAM reward or penalty calculated for each year of the first access arrangement period will be included in the determination of Western Power's target revenue for the second access arrangement period.

4.9 Price control arrangements

The detailed price control arrangements are set out in formulae in the access arrangement. The formulae reflect the policy decisions discussed in the above sections.

It is noted that Western Power has developed two separate price controls that apply to the transmission and distribution network businesses. Revenue that has been earned in relation to the provision of covered services is subject to price control. This includes revenue from reference and non-reference services.

63 Western Power's actual performance will be calculated on the basis of the service standard definitions in section 3.4.3.

64 The present value of such amounts will be calculated using the WACC which applies in the first access arrangement period.

In addition, to illustrate that in aggregate Western Power's total allowable revenue recovers the costs of providing covered services, Western Power has developed a business wide price control (Price Control on Covered Services) which sums the individual price controls that apply to the transmission and distribution network businesses. These arrangements appear to be the best way of meeting the Code requirements.

5 Pricing methods

5.1 Introduction and background

This section of the access arrangement information sets out the Code provisions and the pricing objectives and principles that form the basis of Western Power's pricing methods.

Network access prices applying to the SWIS have been in place since 1996. Initially these prices applied only to contestable consumers. However, in July 2001 network prices were established for all contestable and franchise consumers. At that time, access pricing structures were revised in order to:

- improve the efficiency of the tariff structure and to cater, in particular, for smaller non-contestable consumers; and to
- ensure compatibility between the transmission and distribution tariff structures, so that for distribution–connected consumers the tariffs could be added together at a component level to form a bundled network tariff[65].

Consumers that were contestable prior to July 2001 were given the option at the time of remaining on the previous tariffs or migrating to the new tariffs. This policy was facilitated by the retention of a set of transition tariffs. These transition tariffs have been indexed by CPI plus two percent each year and, over time, consumers on the transition tariffs have migrated to the standard tariffs as these become more cost-effective. Presently, there remain approximately 30 consumers on transition tariffs and this number is expected to drop considerably over the next few years.

Western Power intends to retain the transition tariffs in the forthcoming access arrangement. It should be noted that these transition tariffs are not generally available to users and therefore are not *reference services*. In continuing to provide transition tariffs, Western Power notes the requirements of section 4.34 of the Code which refers to prior contractual rights. Western Power will separately notify the affected customers of the proposed changes to the transition tariffs, and provide a copy of this notification to the Authority for its information.

Details of Western Power's reference tariffs are set out in the *price list*, which is provided as appendix 5 to the access arrangement. The Code does not appear to require Western Power to submit *price list information* relating to the price list. In any event, the description of Western Power's pricing methods in this section sets out the kind of explanatory information that is contemplated by the Code's definition of price list information.

In order to avoid price shocks to particular tariff customers, annual changes to tariff prices for the second and third pricing years of the access arrangement period will be subject to the following side constraints:

- Increase or decrease in any individual tariff being limited to CPI + 2% in any year;

[65] Prior to 2001 the transmission and distribution access price structures were entirely different and customers seeking access to the networks had separate transmission and distribution access contracts and paid separate charges.

- Increase or decrease in any individual tariff components (published figures) being limited to CPI + 2% in any year.

The remainder of this section is structured as follows:

- section 5.2 examines the Code provisions that relate to pricing methods;
- section 5.3 sets out the pricing objectives adopted by Western Power, which underpin the company's detailed pricing methods; and
- Based on the applicable Code provisions and the pricing objectives adopted by Western Power, section 5.4 outlines the principles applied by the company to guide the development of its pricing methods and the design of network tariffs.

5.2 Code provisions

Chapter 7 of the Code sets out the provisions governing the *pricing methods* to be applied by Western Power.

Under section 7.2, an access arrangement may contain any pricing methods provided they collectively meet the objectives set out in sections 7.3 and 7.4 and otherwise comply with Chapter 7. The relevant objectives are as follows:

> **"Objectives of pricing methods - Primary objectives**
>
> 7.3 Subject to sections 7.5 and 7.7, the *pricing methods* in an *access arrangement* must have the objectives that:
>
> (a) *reference tariffs* recover the forward-looking efficient costs of providing *reference services*; and
>
> (b) the *reference tariff* applying to a *user*:
>
> (i) at the lower bound, is equal to, or exceeds, the *incremental cost of service provision*; and
>
> (ii) at the upper bound, is equal to, or is less than, the *stand-alone cost of service provision*.
>
> **Objectives of pricing methods - Other objectives**
>
> 7.4 Subject to sections 7.5 and 7.7, the *pricing methods* in an *access arrangement* must have the objectives that:
>
> (a) the *charges* paid by different *users* of a *reference service* differ only to the extent necessary to reflect differences in the *average cost of service provision* to the *users*; and
>
> (b) the structure of reference tariffs so far as is consistent with the Code objective accommodates the reasonable requirements of users collectively; and
>
> (c) the structure of reference tariffs enables a user to predict the likely annual changes in reference tariffs during the *access arrangement* period; and

(d) the structure of reference tariffs avoids price shocks (that is, sudden material tariff adjustments between succeeding years).

Objectives of pricing methods - Reconciling primary and other objectives

7.5 To the extent that the objectives in section 7.3 conflict with the objectives in section 7.4 in respect of *pricing methods* in a *proposed access arrangement*, the *Authority*, when determining whether the *pricing methods* are consistent with this Chapter 7, must reconcile the conflict, or determine which objective is to prevail, having regard to the *Code objective* but where necessary permitting the objectives in section 7.3 to prevail over the objectives in section 7.4."

Section 7.6 sets out the provisions governing tariff components as follows:

"Unless an *access arrangement* containing alternative *pricing methods* would better achieve the *Code objective*, for a *reference service*:

(a) the *incremental cost of service provision* should be recovered by *tariff* components that vary with usage or demand; and

(b) any amount in excess of the *incremental cost of service provision* should be recovered by *tariff* components that do not vary with usage or demand."

Section 7.7 requires uniform or "postage stamp" charges to be applied to users who transfers electricity out of an exit point in respect of which the contracted maximum demand under a contract for services is less than 1 MVA.

Under section 7.9, Western Power may propose in its access arrangement to discriminate between users in its pricing to the extent that it is necessary to do so to aid economic efficiency through the application of a policy regarding prudent discounts.

Section 7.10 requires Western Power to include in its access arrangement a policy governing the provision of discounts to distributed generation for recognition of network cost savings created specifically by the location of the generator in the network.

Section 7.11 requires that the access arrangement must contain a detailed mechanism for determining when a user will be entitled to receive a discount (in accordance with section 7.9 and 7.10) and for calculating the discount to which the user will be entitled.

5.3 Western Power's network pricing objectives

Western Power proposes that its target revenue will be recovered through a set of tariffs designed to meet the objectives of the pricing methods (as set out in Chapter 7 of the Code), the Code objective (section 2.1), and a number of other objectives adopted by the company. Specifically, under Western Power's pricing methods, the target revenue is recovered from users in a manner that is:

- economically efficient (in accordance with the requirements of sections 7.3(b) and 7.6 of the Code);
- simple and practical (thus facilitating the ability of users to predict likely annual changes in tariffs, as required by section 7.4 (c) of the Code); and

- equitable (in accordance with the requirements of section 7.7 of the Code).

In addition to these high-level objectives, the pricing methods proposed by Western Power have the following aims:

- to deliver the target revenue so as to facilitate the maintenance of a viable network business (in accordance with sections 6.4 and 7.3(a) of the Code) and to facilitate the delivery of efficient network services to all network users;

- to be as cost reflective as is practicable, by reflecting the user's utilisation of the network including use of dedicated assets, pursuant to sections 7.3(b) and 7.6 of the Code;

- to promote efficient use of the network through appropriate price signalling;

- to provide reasonable price stability and certainty, so as to enable network users to make informed investment decisions, as required by section 7.4 of the Code;

- to be as simple and straightforward as is reasonable taking into account other objectives; and

- to avoid cross subsidy between different customer groups, by pricing in an economically efficient manner (in accordance with the requirements of sections 7.3, 7.4 and 7.6 of the Code).

5.4 Network pricing principles

Given the applicable Code provisions, and the objectives outlined above, Western Power has adopted the following principles to guide the development of its pricing methods and the design of network tariffs:

1. Network tariffs are to be designed to recover the target revenue while meeting any applicable side constraints (the aim of which is to prevent price shock to users).

2. Network tariffs will be based on a well defined and transparent methodology.

3. Network tariffs will be based on analysis of the cost of service provision that includes:

    a. definition of the classes of service provided;

    b. allocation of fixed and variable network costs to service classes; and

    c. setting of the fixed and variable components of prices at levels that will recover the fixed and variable costs.

4. Network tariffs will signal the economic cost of service provision in that they will:

    a. avoid cross subsidies between classes of service, and

    b. to the extent practicable, avoid cross subsidies within classes of service.

5. Subject to the provision that the target revenue is to be recovered, network tariffs will be responsive to customer requirements in order to:

    a. avoid economic bypass; and

    b. allow for negotiation and discounting of network prices in accordance with the applicable provisions of the Code.

6. Network tariffs will provide economic signals to encourage efficient use of the network.

7. Where applicable, any "postage stamp" component of network tariffs will be determined in accordance with the requirements of section 7.7 of the Code as far as is practicable.

5.5 Demonstration of compliance of pricing methods with Code provisions

5.5.1 Introduction

The purpose of this section is to demonstrate that the pricing methods applied by Western Power comply with the provisions set out in sections 7.3, 7.4, 7.6, and 7.7 of the Code.[66]

Section 7.1 of the Code defines "pricing methods" as the structure of reference tariffs included in the access arrangement. For convenience, Western Power's reference tariffs are listed below:

Reference tariffs for users connected to the distribution network	RT1	Energy only small
	RT2	Time of use small
	RT3	Energy only large
	RT4	Time of use large
	RT5	Low voltage (LV) metered demand
	RT6	High voltage (HV) metered demand
	RT7	HV Contract maximum demand (HV CMD)
	RT8	LV Contract maximum demand (LV CMD)
	RT9	Unmetered supplies
	RT10	Street lights
	RT11	Distribution connected generation tariffs
Transmission-reference tariffs	TRT1	Transmission nodal tariff (loads)
	TRT2	Transmission nodal tariff (generators)

[66] These sections of the Code specify the requirements that must be met in terms of the pricing objectives, the structuring of reference tariffs and related issues. Western Power's compliance with the Code provisions relating to the requirement for the access arrangement to contain certain policies regarding discounts (namely, sections 7.9 to 7.11 of the Code) is demonstrated in Sections 5.6 and 5.7 below.

Compliance with the Code's requirements regarding the pricing objectives and the structuring of tariffs is demonstrated below, by examining the reference tariffs collectively and, where appropriate, by examining each reference tariff individually.

5.5.2 Recovery of forward-looking efficient costs

The reference tariffs that apply to users connected to the distribution network (reference tariffs RT1 to RT11) are made up of a transmission network related tariff component and a distribution network related tariff component. The two components add together to make a bundled reference tariff. The transmission reference tariffs (TRT1 and TRT2) are made up of transmission network related tariff components only. That is to say, all reference tariffs contain a transmission network related tariff component, while reference tariffs RT1 to RT11 also contain a distribution network tariff component.

As noted in Parts B and C of this submission, the target revenue is determined to recover the forward looking efficient costs of providing covered services that are made up of reference services and non-reference services. Costs relating to the provision of non-reference services are recovered from customers on a fee for service basis. The remainder of the target revenue is recovered from reference tariffs and capital contributions in accordance with the capital contributions policy.

Reference tariffs are designed to recover the target revenue in each year, based on forecast data. However, as noted in section 8.4 of Part B and section 7.4 of Part C of this submission, the price control includes various mechanisms that may permit Western Power to recover certain unforeseen costs that may arise during the access arrangement period. Moreover, the actual revenue collected by the company will be a function of actual, rather than forecast energy volumes. For these reasons, the maximum revenue that the company is permitted to collect each year under the price control may differ from the target revenue.

Notwithstanding this however, the methods of determining the company's target revenue[67] and tariffs ensures that the revenue generated through the sale of covered services recovers an amount that meets the forward-looking and efficient costs of providing covered services, including a return on investment commensurate with the commercial risks involved.

On the basis of the foregoing information, Western Power considers that the requirements of section 7.3(a) of the Code are met.

5.5.3 Reference tariffs should be between incremental and stand-alone cost

The distribution component of reference tariffs RT1 to RT4, RT9 and RT10 are designed to recover the average cost of service provision. For these tariffs the average cost of service provision is greater than the incremental cost because the incremental cost is typically the cost to connect a new customer to the existing infrastructure. These tariffs apply to customers with small to medium energy requirements and, because of the effects of scale economies, the stand-alone cost of service is significantly in excess of the shared or average cost of service provision.

The distribution components of reference tariffs RT7 and RT8 are specifically designed to exceed the incremental cost of service, but be less than the stand-alone cost of service.

[67] As explained in section 7 of Part B and section section 8 of Part C of this submission, Western Power's target revenue is determined in accordance with section 6.4(a)(i) of the Code.

The tariff components of reference tariffs RT5 and RT6 are designed to reflect, on average, the tariff components in reference tariffs RT7 and RT8. On this basis reference tariffs RT5 and RT6 exceed the incremental cost, but are below the stand-alone cost of service provision.

Reference tariff RT11 is specifically designed to exceed the incremental cost, and be less than the stand-alone cost of service provision because it is based on reference tariffs RT7 and RT8.

Section 7.7 of the Code requires the tariffs applying to a standard tariff exit point to be uniform across the SWIS. Notwithstanding the requirements of section 7.3(b) of the Code, reference tariffs RT1 to RT4, RT9 and RT10 are designed to meet the requirement set out in section 7.7 of the Code.

On the basis of the foregoing information, Western Power considers that the requirements of section 7.3(b) of the Code are satisfied.

5.5.4 Differences in charges paid by users to reflect differences in the average cost of service provision

The distribution components of reference tariffs RT1 to RT11, and the transmission components of RT1 to RT11, TRT1 and TRT2, are based on metered quantities including energy usage, energy demand, time of use of energy and demand, and location of connection. The application of each of the tariffs to each of these measured quantities result in different charges to different users.

Where the measured quantities are identical, the charge to the users will be the same for reference tariffs RT1 to RT4, and RT5 and RT6 for demands less than 1 MVA. For reference tariffs RT7, RT8 and RT11, as well as RT5 and RT6 where demand exceeds 1 MVA, the charges will vary according to location, to the extent that the users are supplied from different geographical sections of the network to which different locational price components apply, reflecting the different average cost of service in those different parts of the network.

For transmission, location specific nodal prices are derived using the T-Price computer model. This model establishes a price refecting average costs at each network node (substation / connection point). It is noted that all Australian utilities use T-Price to calculate transmission network prices.)

Reference tariffs RT5 to RT8, and RT11 employ the transmission nodal prices directly in deriving the price components. The transmission tariff components of reference tariffs RT1 to RT4, RT9 and RT10 are set to recover the average cost of service for standard exit points.

On the basis of the foregoing information, Western Power considers that the requirements of section 7.4(a) of the Code have been met.

5.5.5 Structure of reference tariffs to accommodate the reasonable requirements of users collectively

All reference tariffs have been developed through a consultative process that involved the Office of Energy and an industry consultative committee called the "Electricity Access Consultative Committee" (EACC). The EACC comprised representatives of generators, retailers and energy consumers.

Most tariffs have been in place since 2001 and are accepted by the electricity industry as being appropriate for the provision of network access. It is considered that the tariffs reflect the reasonable requirements of network users. On this basis, Western Power considers that the requirements of section 7.4(b) have been met.

5.5.6 Structure of tariffs should enable a user to predict the likely changes

All reference tariffs are specified clearly for the first year of the access arrangement period. For each subsequent year of the access arrangement period, network users will be able to predict annual price movements because:

- transmission and distribution reference tariff component adjustments through the access arrangement period will reflect, on average, the movement in the average price control variable which is specified at the start of the period; and

- side constraints apply on all tariff component adjustments to limit annual price movements.[68]

On this basis, Western Power considers that the requirements of section 7.4(c) of the Code are met.

5.5.7 Avoidance of price shocks

Reference tariffs are specified for the first year of the access arrangement period. Subsequent price shock during the access arrangement period is avoided by the following measures:

- Transmission and distribution reference tariff component adjustments during the access arrangement period will reflect, on average, the movement in the average price control variable. This average "price path" recovers a target revenue that is effectively smoothed across the access arrangement period rather than being set to recover actual "building block" costs from year to year.

- Side constraints on all tariff component adjustments are applied to limit any annual price movement.

Moreover, to ensure that customers do not face significant increases in prices (and having regard to section 6.4(c) of the Code), Western Power is proposing to include the future costs and revenues arising from capital contributions in its building block calculations. As noted in section 6.3 of Part B, the effect of this treatment is neutral in revenue terms over a number of access arrangement periods, but has the desirable effect of reducing Western Power's tariff related revenue requirement in the forthcoming access arrangement period and thereby reducing potential price rises.

On this basis, Western Power considers that the requirements of section 7.4(d) of the Code are met.

5.5.8 Fixed and variable components of tariffs to reflect underlying cost structure

Reference tariff components have been designed to recover the cost of service provision in a cost reflective manner. Reference tariffs RT1 to RT4, RT9 and RT10, recover the average costs of service provision across the SWIS, and reference tariffs

[68] Further details of the price control are set out in section 4 of this Part D.

RT5 to RT8, and RT11 recover the cost of service provision taking location into account.

The incremental cost of service provision is determined as the cost to provide substantial new network capacity to meet users' energy requirements. These costs are recovered through tariff components that reflect the demand and energy usage of the network.

The costs of the network that exceed the incremental costs include administrative costs, costs to establish a basic low capacity network, and costs to service the low capacity network. These costs do not vary with demand and energy consumption and are recovered through tariff components that do not vary with individual user demand and energy amounts.

On the basis of the foregoing information, Western Power considers that the requirements of section 7.6 of the Code are met.

5.5.9 Postage stamp charges in certain cases

Reference tariffs RT1 to RT6, RT9 and RT10 apply uniformly to all standard tariff users (those with a maximum demand less than 1 MVA) across the SWIS, irrespective of location. On this basis, Western Power considers that the requirements of section 7.7 of the Code are satisfied.

5.6 Policy relating to prudent discounting

5.6.1 Code provisions

Section 7.9 of the Code states:

> "A *service provider* may propose in its *access arrangement* to discriminate between *users* in its pricing of *services* to the extent that it is necessary to do so to aid economic efficiency, including:
>
> (a) by entering into an agreement with a *user* to apply a *discount* to the *equivalent tariff* to be paid by the user for a *covered service*; and
>
> (b) then, recovering the amount of the *discount* from other *users* of *reference services* through *reference tariffs*."

5.6.2 Western Power's policy

Reference tariffs are designed to reflect the costs of providing reference services. Reference services will normally represent the most cost-effective option for transporting electricity between generators and load users.

However, there may be cases where an existing or prospective network user has available an option available that is more cost-effective (from the user's perspective) than the reference service. In such cases, economic efficiency is aided if the user is encouraged - by being offered a discount on the reference tariff - to continue to use the reference service, provided always that the discounted price covers the avoidable (or incremental) cost of continuing to provide the reference service. The offering of a discount in this way, and the funding of the discount by the remaining existing users, aids economic efficiency because:

- it discourages inefficient new network developments that replicate or bypass existing infrastructure;

- it results in an increase in (or at least, the maintenance of) average network utilisation, compared to the level that would prevail if the relevant user chose not to use the reference service; and

- it results in a reduction in the level of average network costs compared to the level that would prevail if the relevant user chose not to use the reference service (and therefore made no contribution to the cost of the network).

In view of these considerations, and in accordance with the provisions set out in the section 7.9 of the Code, Western Power's policy relating to prudent discounting is as follows:

- In exercising its discretion with regard to prudent discounting under section 7.9 of the Code, Western Power will have regard to the pricing objectives in sections 7.3 and 7.4 of the Code.

- Western Power may offer a prudent discount if the existing user or applicant seeking access to the SWIS is able to demonstrate that an alternative option will provide a comparable service at a lower price than that offered by Western Power's reference services and reference tariffs.

- The existing user or applicant must provide Western Power with sufficient details of the cost of the alternative option to enable Western Power to calculate the annualised cost of the alternative option.

- Western Power's discounted price offer will be set to reflect the higher of:

    - the cost of the alternative option, or

    - the incremental cost of service provision.

- Information supporting the discount including details of the alternative option will be submitted by Western Power to the Authority on a confidential basis. The offer and acceptance of a discount will be conditional on the Authority's approval that the discount is prudent.

5.7 Discounts for distributed generation

5.7.1 Code provisions

Section 7.10 of the Code states:

> "If a *user* seeks to *connect distributed generating plant* to a *covered network*, a *service provider* must reflect in the *user's tariff*, by way of a *discount*, a share of any reductions in either or both of the *service provider's capital-related costs* or *non-capital costs* which arise as a result of the *entry point* for *distributed generating plant* being located in a particular part of the *covered network* by:
>
> (a) entering into an agreement with a *user* to apply a *discount* to the *equivalent tariff* to be paid by the *user* for a *covered service*; and
>
> (b) then, recovering the amount of the *discount* from other *users* of *reference services* through *reference tariffs*."

5.7.2 Western Power's Policy

Western Power believes that it is appropriate to encourage distributed generation where this leads to a net saving in providing network services to customers. Savings in network costs will accrue if Western Power is able to avoid costs as a result of an embedded generator connecting to its network. The determination of any saving will be based on the total costs incurred with the generator connecting, compared to the total costs incurred if the generator does not connect.

In assessing the saving that arises from the embedded generator it is necessary to study the impact on Western Power's network operating and capital expenditure over an extended period of time. Ideally, the analysis might extend 20 years, examining the present value of the costs with and without the generator connecting. However, data limitations may suggest that a shorter period of analysis is more appropriate.

Western Power's policy is that the cost analysis will be conducted over a period of at least 10 years, depending on the availability and accuracy of data. A discount will only be payable if the calculated saving from the connecting generator is greater than zero. The discount will be paid in all circumstances, including where the discount exceeds the access charges.

The saving will be calculated in present value terms and, using the *WACC*, converted to an equivalent annualised discount for a defined period of time, as agreed by the parties. This means that the distributed generator can, within reason, can negotiate a shorter or longer period over which the discounts are received providing that the total value of the discounts, in present value terms, remains unchanged.

Western Power will provide information to the Authority on a confidential basis showing the calculation of any discounts to distributed generators. The offer and acceptance of a discount will be conditional on the *Authority's* approval that the discount meets the requirements of:

(a) the Code; and

(b) Western Power's Access Arrangement.

6 Applications and queuing policy

6.1 Introduction

Section 5.1(g) of the Code states that an access arrangement must include an applications and queuing policy under sections 5.7 to 5.11.

Broadly speaking, the purpose of an applications and queuing policy is to manage applications for an access contract in an orderly and fair manner, especially where network capacity is scarce. Section 5.7 of the Code provides a more detailed summary of the scope of the applications and queuing policy. Section 5.7 states:

"An *applications and queuing policy* must:

(a) to the extent reasonably practicable, accommodate the interests of the *service provider* and of *users* and *applicants*; and

(b) be sufficiently detailed to enable *users* and *applicants* to understand in advance how the *applications and queuing policy* will operate; and

(c) set out a reasonable timeline for the commencement, progressing and finalisation of *access contract* negotiations between the *service provider* and an *applicant*, and oblige the *service provider* and *applicants* to use reasonable endeavours to adhere to the timeline; and

(d) oblige the *service provider*, subject to any reasonable confidentiality requirements in respect of *competing applications*, to provide to an *applicant* all commercial and technical information reasonably requested by the *applicant* to enable the *applicant* to apply for, and engage in effective negotiation with the *service provider* regarding, the terms for an *access contract* for a *covered service* including:

   i. information in respect of the availability of *covered services* on the *covered network;* and

   ii. if an *augmentation* will be required to provide the *covered services* sought:

      A. operational and technical details of the *required augmentation*; and

      B. commercial information regarding the likely cost of the *required augmentation*; and

(e) set out the procedure for determining the priority that an *applicant* has, as against another *applicant*, to obtain *access* to *covered services*, where the *applicants' access applications* are *competing applications*; and

(f) to the extent that *contestable consumers* are *connected* at *exit points* on the *covered network*, contain provisions dealing with the transfer of capacity associated with a *contestable consumer* from the *user* currently supplying the *contestable consumer* ('outgoing user') to another *user* or an *applicant* ('incoming user') which, to the extent that it is applicable, are consistent with and facilitate the operation of any *customer transfer code*; and

(g) establish arrangements to enable a *user* who is:

   i. a *supplier of last resort* as defined in section 67 of the Act to comply with its obligations under Part 5 of the Act; and

ii. a *default supplier* under regulations made in respect of section 59 of the Act to comply with its obligations under section 59 of the Act and the regulations; and

(h) facilitate the operation of Part 9 of the Act, any enactment under Part 9 of the Act and the market rules as defined in section 121(1) of the Act; and

(i) if applicable, contain provisions setting out how *access applications* (or other requests for *access* to the *covered network*) lodged before the start of the relevant *access arrangement period* are to be dealt with."

The remainder of this section of the submission is structured as follows:

- section 6.2 cites the remaining Code provisions in relation to the applications and queuing policy, and concludes with a brief statement of Western Power's approach to establishing its policy; and
- section 6.3 explains that Western Power's amendments to the model applications and queuing policy comply with the Code, and are explained in more detail in Appendix 8 to this submission.

6.2 Code provisions

In addition to section 5.7 of the Code, the following provisions are relevant to the establishment of the applications and queuing policy.

"5.8 The paragraphs of section 5.7 do not limit each other.

5.9 Under section 5.7(e), the *applications and queuing policy* may:

(a) provide that if there are *competing applications*, then priority between the *access applications* is to be determined by reference to the time at which the *access applications* were lodged with the *service provider*, but if so the *applications and queuing policy* must:

(i) provide for departures from that principle where necessary to achieve the *Code objective*; and

(ii) contain provisions entitling an *applicant*, subject to compliance with any reasonable conditions, to:

A. current information regarding its position in the queue; and

B. information in reasonable detail regarding the aggregated capacity requirements sought in *competing applications* ahead of its *access application* in the queue; and

C. information in reasonable detail regarding the likely time at which the *access application* will be satisfied; and

(b) oblige the *service provider*, if it is of the opinion that an *access application* relates to a particular project or development

(i) which is the subject of an invitation to tender; and

(ii) in respect of which other access applications have been lodged with the service provider, (project applications) to, treat the *project applications*, for the purposes of determining their priority, as if each of them had been

lodged on the date that the *service provider* becomes aware that the invitation to tender was announced.

5.10 An *applications and queuing policy* may:

(a) be based in whole or in part upon the *model applications and queuing policy*, in which case, to the extent that it is based on the *model applications and queuing policy*, any matter which in the *model applications and queuing policy* is left to be completed in the *access arrangement*, must be completed in a manner consistent with:

(i) any instructions in relation to the matter contained in the *model applications and queuing policy*; and

(ii) sections 5.7 to 5.9;

(iii) the *Code objective*; and

(b) be formulated without any reference to the *model applications and queuing policy* and is not required to reproduce, in whole or in part, the *model applications and queuing policy*.

5.11 The *Authority*:

(a) must determine that an *applications and queuing policy* is consistent with sections 5.7 to 5.9 and the *Code objective* to the extent that it reproduces without material omission or variation the *model applications and queuing policy*; and

(b) otherwise must have regard to the *model applications and queuing policy* in determining whether the *applications and queuing policy* is consistent with sections 5.7 to 5.9 and the *Code objective*."

Western Power has made a number of relatively minor but important modifications to the *model applications and queuing policy*, which are detailed in section 6.3 below. In making these modifications, and in accordance with section 5.10(a) of the Code, Western Power has had regard to:

- any instructions in relation to the matter contained in the *model applications and queuing policy*;
- sections 5.7 to 5.9 of the Code; and
- the *Code objective*.

6.3 Western Power's modifications to the *model applications and queuing policy*

Appendix 8 to this submission explains in detail each of the material modifications that Western Power has made to the model application and queuing policy. Each modification is justified with reference to the requirements of section 5.10(a) of the Code.

7 Capital contributions policy

7.1 Introduction

Section 5.1(h) of the Code states that an access arrangement must include a capital contributions policy under sections 5.12 to 5.17.

Broadly speaking, the capital contributions policy applies where it is necessary for Western Power to undertake an augmentation, or a procure a non-network option (for example, by contracting with a generator for network support) in order to provide to an applicant a covered service which is sought in an access application. The capital contribution policy describes the circumstances in which a capital contribution will be payable by the applicant and the method for calculating the capital contribution.

It should be noted that the capital contributions policy does not describe the circumstances in which an end-consumer of electricity becomes liable for a connection charge.[69] Instead, the capital contributions policy only addresses capital contributions that are payable by users or applicants pursuant to an access contract.

The remainder of this section is structured as follows:

- section 7.2 cites the Code provisions in relation to the capital contributions policy, and concludes with a brief statement of Western Power's approach to establishing its policy; and

- section 7.3 explains that Western Power's amendments to the capital contributions policy comply with the Code, and are explained in more detail in Appendix 9 to this submission.

7.2 Code provisions

This section provides details of the relevant Code provisions in relation to the capital contributions policy, and concludes with a summary of Western Power's approach to establishing its policy.

"5.12 The objectives for a *capital contributions policy* must be that:

(a) in respect of a *required augmentation*, it strikes a balance between the interests of:

i. the *contributing user*; and

ii. other *users*; and

iii. *consumers*;

and

(b) it does not constitute an inappropriate barrier to entry.

5.13 A *capital contributions policy* must facilitate the operation of this Code, including:

(a) section 2.9; and

[69] That matter is dealt with in the Western Power Networks Customer Charter

(b) the *new facilities investment test*; and

(c) the *regulatory test*.

5.14 A *capital contributions policy* must not require a *user* to make a *capital contribution* in respect of any part of *new facilities investment* which meets the *new facilities investment test*.

5.15 A *capital contributions policy* must set out:

(a) the circumstances in which a *contributing user* may be required to make a *capital contribution* in respect of a *required augmentation*; and

(b) the method for calculating any *capital contribution* a *contributing user* may be required to make towards the *required augmentation*; and

(c) for any *capital contribution*:

i. the terms on which a *contributing user* must make the *capital contribution*; or

ii. a description of how the terms on which a *contributing user* must make the *capital contribution* are to be determined.

5.16 A *capital contributions policy* may:

(a) be based in whole or in part upon the *model capital contributions policy*, in which case, to the extent that it is based on the *model capital contributions policy*, any matter which in the *model capital contributions policy* is left to be completed in the *access arrangement*, must be completed in a manner consistent with:

i. any instructions in relation to the matter contained in the *model capital contributions policy*; and

ii. sections 5.12 to 5.15; and

iii. the *Code objective*;

and

(b) be formulated without any reference to the *model capital contributions policy* and is not required to reproduce, in whole or in part, the *model capital contributions policy*.

5.17 The *Authority*:

(a) must determine that a *capital contributions policy* is consistent with sections 5.12 to 5.15 and the *Code objective* to the extent that it reproduces without material omission or variation the *model capital contributions policy*; and

(b) otherwise must have regard to the *model capital contributions policy* in determining whether the *capital contributions policy* is consistent with sections 5.12 to 5.15 and the *Code objective*."

Western Power has made a number of relatively minor but important modifications to the model capital contributions policy, which are detailed in section 7.3 below. In

making these modifications, and in accordance with section 5.16(a) of the Code, Western Power has had regard to:

- any instructions set out in the Code that relate to the matter contained in the model capital contributions policy;
- sections 5.12 to 5.15 of the Code; and
- the Code objective.

7.3 Western Power's modifications to the *model capital contributions policy*

Appendix 9 explains in detail each of the material modifications that Western Power has made to the model capital contributions policy. Each modification is justified with reference to the requirements of section 5.16(a) of the Code.

8 Standard access contract

8.1 Introduction

Section 5.1(b) of the Code states that an access arrangement must include a standard access contract under sections 5.3 to 5.5.

Broadly speaking, the standard access contract sets out the terms and conditions on which Western Power offers to provide covered services to applicants and users. Western Power's standard access contract comprises four parts:

- Part A contains definitions and commencement provisions, and is included in all standard access contracts issued by Western Power.

- Part B contains provisions dealing with capacity services. It forms part of the capacity contract. A capacity contract is a type of access contract typically used by a user who does not operate a power station but buys electricity in bulk and sells it to consumers.

- Part C contains provisions dealing with technical compliance. It forms part of the technical compliance contract. A technical compliance contract is a type of access contract typically used by a user that operates a power station and sells electricity in bulk to another user such as a retailer. A technical compliance contract deals with technical matters relating to the operation of the power station and its connection to the network.

- Part D contains general contractual provisions, and is included in all access contracts.

The remainder of this section is structured as follows:

- section 8.2 cites the Code provisions in relation to the *standard access contract*, and concludes with a brief statement of Western Power's approach to establishing its *standard access contract*;

- section 8.3 explains that Western Power's amendments to the standard access contract set out in the Code, and are explained in more detail in Appendix 10 to this submissions.

8.2 Code provisions

This section cites the relevant Code provisions relating to the standard access contract, and concludes with a summary of Western Power's approach to establishing its standard access contract.

"5.3 A *standard access contract* must be:

(a) reasonable; and

(b) sufficiently detailed and complete to:

i. form the basis of a commercially workable *access contract*; and

ii. enable a *user* or *applicant* to determine the value represented by the *reference service* at the *reference tariff*.

5.4 A *standard access contract* may:

(a) be based in whole or in part upon the *model standard access contract*, in which case, to the extent that it is based on the *model standard access contract*, any matter which in the *model standard access contract* is left to be completed in the *access arrangement*, must be completed in a manner consistent with:

i. any instructions in relation to the matter contained in the *standard access contract*; and

ii. sections 5.3; and

iii. the *Code objective*;

and

(c) be formulated without any reference to the *model standard access contract* and is not required to reproduce, in whole or in part, the *model standard access contract*.

5.5 The *Authority*:

(c) must determine that a *standard access contract* is consistent with section 5.3 and the *Code objective* to the extent that it reproduces without material omission or variation the *model standard access contract*; and

(d) otherwise must have regard to the *model standard access contract* in determining whether the *standard access contract* is consistent with section 5.3 and the *Code objective*."

Western Power has made a number of important modifications to the model standard access contract, which are detailed in section 8.3 below. In making these modifications, and in accordance with section 5.4(a) of the Code, Western Power has had regard to:

- any instructions in the Code relating to the matter contained in the model standard access contract;
- section 5.3 of the Code; and
- the Code objective.

It should also be noted that Western Power is obliged to include a transfer and relocation policy in its access arrangement in accordance with sections 5.18 to 5.24 of the Code. The model standard access contract includes some provisions in relation to bare transfers, which form an element of the transfer and relocation policy. Western Power has included some further modifications to the model standard access contract to address the Code provisions relating to the transfer and relocation policy. These additional modifications are also explained in section 8.3 below.

8.3 Western Power's modifications to the model standard access contract

Appendix 10 explains in detail each of the material modifications that Western Power has made to the model standard access contract. Each modification is justified with reference to the requirements of section 5.4(a) of the Code.

9 Transfer and relocation policy

9.1 Introduction

Section 5.1(i) of the Code states that an access arrangement must include a *transfer and relocation policy* under sections 5.18 to 5.24. There is no model policy in the Code.

Broadly speaking, the transfer and relocation policy sets out the circumstances under which a User may assign its access rights or relocate its contracted capacity, together with the conditions attached to any such arrangement. A copy of the transfer and relocation policy is included in appendix 2 of the Access Arrangement.

The remainder of this section is structured as follows:

- section 9.2 cites the Code provisions in relation to the *transfer and relocation policy*;
- section 9.3 explains Western Power's *transfer and relocation policy* noting the policy's compliance with the relevant provisions in the Code; and
- section 9.4 provides some concluding comments.

9.2 Code Provisions

This section cites the relevant Code provisions relating to the transfer and relocation policy as follows:

> "5.18 A *transfer and relocation policy*:
>
> (a) must permit a *user* to make a *bare transfer* without the *service provider's* consent; and
>
> (b) may require that a *transferee* under a *bare transfer* notify the *service provider* of the nature of the *transferred access rights* before using them, but must not otherwise require notification or disclosure in respect of a *bare transfer*.
>
> 5.19 For a *transfer* other than a *bare transfer*, a *transfer and relocation policy*:
>
> (a) must oblige the *service provider* to permit a *user* to *transfer* its *access rights* and, subject to section 5.20, may make a *transfer* subject to the *service provider's* prior consent and such conditions as the *service provider* may impose; and
>
> (b) subject to section 5.20, may specify circumstances in which consent will or will not be given, and conditions which will be imposed, under section 5.19(a).
>
> 5.20 Under a *transfer and relocation policy*, for a *transfer* other than a *bare transfer*, a *service provider*:
>
> (a) may withhold its consent to a *transfer* only on reasonable commercial or technical grounds; and
>
> (b) may impose conditions in respect of a *transfer* only to the extent that they are reasonable on commercial and technical grounds.

5.21 A *transfer and relocation policy*:

(a) must permit a *user* to relocate capacity at a *connection point* in its *access contract* to another *connection point* in its *access contract*, (a "**relocation"**) and, subject to section 5.22, may make a *relocation* subject to the *service provider's* prior consent and such conditions as the *service provider* may impose; and

(b) subject to section 5.22, may specify in advance circumstances in which consent will or will not be given, and conditions which will be imposed, under section 5.21(a).

5.22 Under a *transfer and relocation policy*, for a *relocation* a *service provider*:

(a) must withhold its consent where consenting to a *relocation* would impede the ability of the *service provider* to provide a *covered service* that is sought in an *access application*; and

(b) may withhold its consent to a *relocation* only on reasonable commercial or technical grounds; and

(c) may impose conditions in respect of a *relocation* only to the extent that they are reasonable on commercial and technical grounds.

5.23 An example of a thing that would be reasonable for the purposes of sections 5.20 and 5.22 is the *service provider* specifying that, as a condition of its agreement to a *transfer* or *relocation*, the *service provider* must receive at least the same amount of revenue as it would have received before the *transfer* or *relocation*, or more revenue if *tariffs* at the destination point are higher.

5.24 Section 5.23 does not limit the things that would be reasonable for the purposes of sections 5.20 and 5.22."

9.3 Western Power's transfer and relocation policy

9.3.1 Bare Transfer

In the policy, bare transfer is defined to mean an *assignment* under which the assignor *assign*s the whole or a part of its *access rights* under an *access contract* to an assignee, but under which there is no *novation*, with the result that the assignor's obligations under the *access contract* for *services*, and all other terms of the *access contract* for *services*, remain in full force and effect after the *assignment*, whether or not the assignee becomes bound to the assignor or any other party to fulfill those obligations.

The policy allows for a User, acting as a reasonable and prudent person, to make a bear transfer without the consent of Western Power and so long as the User notifies Western Power of the nature of the assigned rights and the identity of the assignee before the assignee commences using the assigned rights.

It should be noted that the requirements of the transfer and relocation policy with regard to disclosure under 5.19 b) appear to preclude a requirement to disclose the identity of the assignee. However, this conflicts with clauses in the model access contract which is presumed to apply.

The policy makes it clear that the obligations can not be assigned, so that the User is not released from any obligations under the access contract and remains wholly liable to Western Power for any default. Further, the assignment does not release

the provider of any bank guarantees under the access contract from any such obligations to Western Power.

These clauses protect the interests of Users in general whilst enabling individual to assign access rights without requiring prior consent.

The assignee is prevented from further assigning the access rights to another party, but such assignment could be effected under this policy by a transfer back to the assignor and thereafter to the third party.

9.3.2 Transfer other than a bare transfer

Consistent with 5.19 and 5.20, assignments other than bare transfers can be effected subject to the User providing satisfactory evidence of the financial and technical capability of the proposed assignee to perform the User's obligations in respect of the assigned access rights.

Similarly, the commercial and technical conditions that such an assignment may be subject to are specified as follows:

- The assignor and assignee entering into a deed of novation with Western Power
- If the assignee is an Australian Bank, then assignment is subject to execution of an appropriate tripartite deed of execution and reimbursable by the User of Western Power's reasonable costs incurred in executing the deed
- If the assignee is a technically and financially competent person, then assignment is subject to there not being several liability between the User and the proposed assignee and it being demonstrated to Western Power's satisfaction that such assignment would not expose it to materially increased technical or financial risk.

9.3.3 Relocation

In accordance with section 5.21 and 5.22 of the Code, the policy permits a User to effect relocation so long as it effects any decrease at the contracted point in accordance with the standard access contract provisions. Similarly it must effect any change at the destination point (whether or not this was previously a contracted point) in accordance with electricity transfer contract and application and queuing policy as may be applicable.

Other rights required by the Code, for example 5.22 (a), are set out in the application and queuing policy.

9.3.4 Western Power's costs

The policy allows for Western Power to recover any reasonable costs from the User in relation to processing any application under the transfer and relocation policy.

9.4 Concluding comments

The discussion presented in section 9.3 demonstrates that Western Power's transfer and relocation policy complies with the relevant Code provisions. A copy of Western Power's transfer and relocation policy is provided in Appendix 2 of the Access Arrangement.

10 Trigger events

10.1 Code provisions relating to *trigger events*

The following Code provisions are relevant to the definition of trigger events:

> **"trigger event"** is a set of one or more circumstances specified in an *access arrangement* under section 5.1(l)(ii), the occurrence of which requires a *service provider* to submit *proposed revisions* to the *Authority* under section 4.37.

4.37 If an *access arrangement*:

(a) specifies one or more *trigger events*; and

(b) the conditions of a *trigger event* are satisfied, then:

(c) as soon as practicable, the *service provider* must notify the *Authority* that the conditions of the *trigger event* are satisfied; and

(d) the *service provider* must submit *proposed revisions* to the *Authority* by the *designated date*; and

(e) the *Authority* must consider the *proposed revisions* in accordance with sections 4.46 to 4.52.

5.1(l) An *access arrangement* must include provisions dealing with:

(i) the submission of *proposed revisions* under sections 5.29 to 5.33; and

(ii) *trigger events* under sections 5.34 to 5.36.

5.34 If it is consistent with the *Code objective* an *access arrangement* may specify one or more *trigger events*.

5.35 To avoid doubt, under section 5.34, an *access arrangement* may specify a *trigger event* which was not proposed by the *service provider*.

5.36 Before determining whether a *trigger event* is consistent with the *Code objective* the *Authority* must consider:

(a) whether the advantages of including the *trigger event* outweigh the disadvantages of doing so, in particular the disadvantages associated with decreased regulatory certainty; and

(b) whether the *trigger event* should be balanced by one or more other *trigger events*.

> {Example: The *service provider* may wish to include a *trigger event* allowing it to reopen the *access arrangement* if actual *covered service* consumption is more than x% below forecast. However, if the *Authority* were minded to allow such a *trigger event*, it may also require the inclusion of a complementary *trigger event* requiring the *service provider* to reopen the *access arrangement* if *covered service* consumption is more than y% above forecast.}

15.3 Without limiting sections 5.34 to 5.36, an *access arrangement* for a *covered network* which forms part of the *SWIS* may specify as *trigger events* one or more events or sets of circumstances in connection with the arrangements

established under Part 9 of the Act [Note: Part 9 relates to the development of market rules for the wholesale supply of electricity].

15.4 Without limiting sections 5.34 to 5.36, an *access arrangement* for a *covered network* may specify as *trigger events* one or more events or sets of circumstances in connection with changes to the thresholds for contestability with respect to electricity supply.

10.2 Considerations guiding the definition of *trigger events*

In considering how Western Power might define trigger events, it is important to consider how the Code addresses other examples of risk and uncertainty. In particular, the Code also provides for the recovery of costs arising from:

- unforeseen events (section 6.6 of the Code);
- technical rule changes (section 6.9); and
- the investment adjustment mechanism – defined differences between forecast and actual capital expenditure (sections 6.13 to 6.18).

Each of these provisions addresses issues of risk, which might otherwise be covered by a trigger event. It is noteworthy that the above three mechanisms for addressing risk do not require a re-opening of the access arrangement. In other words, the likely consequences arising from unforeseen events; technical rule changes; or capital expenditure forecasting errors are not considered sufficiently material to warrant a formal revision to the access arrangement. These observations are important because they provide guidance in defining the scope of trigger events.

In light of the foregoing discussion, Western Power considers that:

- trigger events should cover circumstances that potentially require material changes to the access arrangement (and also warrant the detailed review and approval process that must be conducted by the Authority under section 4.52); and
- trigger events should not cover matters that are addressed by the mechanisms covering unforeseen events; technical rule changes; and investment adjustments.

In addition to the above, it is also noted that the Code makes specific references to the development of the market rules and contestability as being two possible areas where trigger events could be defined (sections 15.3 and 15.4 respectively).

10.3 Provisions enabling the Authority to re-open an access arrangement

In addition to the trigger event provisions, the Code also provides for the Authority to revise the access arrangement in the event that significant unforeseen developments have occurred. Specifically, section 4.38(b)(ii) states the Authority may by notice to a service provider vary the price control or pricing methods in an access arrangement before the next revisions commencement date, but only if the Authority determines that significant unforeseen developments have occurred that:

- are outside the control of the service provider; and

- are not something that the service provider, acting in accordance with good electricity industry practice, should have been able to prevent or overcome; and

- have an impact so substantial that the Authority considers that the advantages of making the variation before the end of the access arrangement period outweigh the disadvantages, having regard to the impact of the variation on regulatory certainty.

It is noted that apart from the guidance provided in section 4.38(b)(ii) "unforeseen developments" is not a defined term in the Code. In essence, its apparent effect is to give the Authority an opportunity to revise the access arrangement, whether or not the event is captured within the definition of a trigger event. On this interpretation, narrowing the scope of trigger events does not necessarily restrict the Authority's ability to revise the access arrangement if a significant unforeseen development arises.

The notion of an access arrangement being re-opened as a result of the occurrence of a significant unforeseen development seems very consistent with the Code objective. However, it is not clear whether section 4.38(b)(ii) of the Code would provide a reasonable means to Western Power to seek a re-opening of the access arrangement if the company considered that a significant unforeseen development had occurred. Indeed, it is noteworthy that at least one other Australian regulator has stated that: "only TNSPs [the regulated companies] would be able to propose that the revenue cap be reopened" [70].

On the basis of the reasoning adopted in the ACCC's December 2004 Decision on its Statement of Principles, and given the fact that section 4.38(b)(ii) has been included in the Code, it would seem reasonable for Western Power to seek to define trigger event in a way that encompasses the "significant unforeseen developments" referred to in section 4.38(b)(ii). This would provide both Western Power and the Authority with an ability to initiate a re-opening of an access arrangement if a significant unforeseen development occurs.

10.4 Identification of proposed *trigger events*

As noted already, section 5.34 states that if it is consistent with the Code objective an access arrangement may specify one or more trigger events. The Code objective (set out in section 2.1) is to:

> promote the economically efficient:
>
> (a) investment in; and
>
> (b) operation of and use of,
>
> *networks* and *services* of *networks* in Western Australia in order to promote competition in markets upstream and downstream of the *network*s.

On this basis, Western Power proposes the inclusion of the trigger events defined in paragraphs (a), (b) and (c) below on the basis that:

[70] Decision 7.2 of the ACCC's Statement of Principles for the Regulation of Electricity Transmission Revenues, 8 December 2004.

- The inclusion of each trigger event reduces the company's financial exposure to defined events that are beyond its control and which, if eventuated, would have a material impact on the financial performance of the company.

- The company could therefore reasonably claim that if the proposed trigger event provision were not allowed either:

    - network prices would need to reflect the higher risks borne by shareholders (which would be less conducive to efficient use of the network); or

    - investment in networks would be lower than would otherwise be the case.

- Either of two outcomes listed immediately above would be inconsistent with the Code objective, and therefore the inclusion of the proposed trigger events in the company's access arrangement is warranted, and meets the requirements of section 5.34.

Based on the foregoing discussion, Western Power proposes to define three trigger events, as follows:

(a) A decision by the Authority; or Government; or an appointed agent or industry body that imposes costs on Western Power in order to facilitate the development of market rules or the introduction of contestability;

(b) A decision by the Authority; or Government; or an appointed agent or industry body that requires Western Power to reorganise or restructure its operations; and

(c) Any significant unforeseen development which has a materially adverse impact on the service provider and which is:

    (i) outside the control of the service provider; and

    (ii) not something that the service provider, acting in accordance with good electricity industry practice, should have been able to prevent or overcome; and

    (iii) an event the impact of which is so substantial that the Authority considers that the advantages of making the variation before the end of the access arrangement period outweigh the disadvantages, having regard to the impact of the variation on regulatory certainty.

For each trigger event, the remedy is to allow Western Power to propose amendments to the access arrangement to recover the costs arising from the trigger event.

11 Supplementary matters

11.1 Introduction

The access arrangement is required to include provisions dealing with supplementary matters under section 5.27 and 5.28 of the Code. In general, supplementary matters will be dealt with in a manner consistent with the Wholesale Electricity Market Rules and the Metering Code.

This section examines the relevant provisions of the Code and related instruments, and explains Western Power's proposed treatment of each of the supplementary matters.

11.2 Code provisions

As already noted, sections 5.27 to 5.28 of the Code set out the provisions relating to supplementary matters as follows:

5.27 Each of the following matters is a "supplementary matter":

(c) balancing; and

(d) line losses; and

(e) metering; and

(f) ancillary services; and

(g) stand-by; and

(h) trading; and

(i) settlement; and

(j) any other matter in respect of which arrangements must exist between a *user* and a *service provider* to enable the efficient operation of the *covered network* and to facilitate *access* to *services*, in accordance with the *Code objective*.

5.28 An *access arrangement* must deal with a *supplementary matter* in a manner which:

(a) to the extent that the *supplementary matter* is dealt with in:

(i) an enactment under Part 9 of the Act; or

(ii) the 'market rules' as defined in section 121(1) of the Act,

applying to the *covered network* -- is consistent with and facilitates the treatment of the *supplementary matter* in the enactment or market rules; and

(b) to the extent that the *supplementary matter* is dealt with:

(i) in a *written law* other than as contemplated under section 5.28(a); and

(ii) in a manner which is not inconsistent with the requirement under section 5.28(a) to the extent that it applies to the *covered* network,

is consistent with and facilitates the treatment of the *supplementary matter* in the *written law*; and

(c) otherwise -- in accordance with the *technical rules* applying to the *covered network* and the *Code objective*.

11.3 Related instruments

11.3.1 Market Rules

The Wholesale Electricity Market Rules (5 October 2004) are made under Part 9 of the Electricity Industry Act 2004, and govern the market and the operation of the South West Interconnected System, including the wholesale sale and purchase of electricity, Reserve Capacity, and Ancillary Services.

The objectives of the market are:

(a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West Interconnected System;

(b) to encourage competition among generators and retailers in the South West Interconnected System, including by facilitating efficient entry of new competitors;

(c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;

(d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and

(e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

The Market Rules are available at:
http://www.eriu.energy.wa.gov.au/files/wholesale/gg177.pdf

11.3.2 Metering Code

The Electricity Industry Metering Code 2005 (Metering Code) is made under Division 7 of Part 2 of the Electricity Industry Act 2004, and is issued by the Authority. The Metering Code contains provisions governing the metering of the supply of electricity including:

- the provision, operation and maintenance of metering equipment; and
- ownership of and access to metering data.

As at the time of preparing this document, the Metering Code is being finalised and is expected to be published (at http://www.era.wa.gov.au) in October 2005.

11.4 Proposed treatment of supplementary matters

Having regard to the respective objectives and purposes of the Code, the Metering Code and the Market Rules, Western Power proposes to adopt the approaches detailed below in relation to supplementary matters.

11.4.1 Balancing

Balancing requirements under the access arrangement shall be in accordance with the Market Rules.

11.4.2 Line Losses

Requirements for the treatment of line losses under the access arrangement shall be in accordance with the Market Rules.

11.4.3 Metering

Metering requirements under the access arrangement shall be in accordance with the Metering Code.

11.4.4 Ancillary Services

Requirements for the treatment of ancillary services under the access arrangement shall be in accordance with the Market Rules.

11.4.5 Stand-by

The requirement for generation stand-by has been superseded by the Market Rules and is no longer applicable.

11.4.6 Trading

Trading requirements under the access arrangement shall be in accordance with the Market Rules.

11.4.7 Settlement

Settlement requirements under the access arrangement shall be in accordance with the Market Rules.

11.4.8 Any other matters

Western Power is not aware of any other matter in respect of which arrangements must exist between a user and a service provider to enable the efficient operation of the covered network and to facilitate access to services, in accordance with the Code objective. However, Western Power believes that it is prudent to provide for interim arrangements in the event that the wholesale energy market does not commence on or before the start of Western Power's access arrangement. Western Power has therefore provided for "interim arrangements" in its access arrangement.

Appendices

Appendix 1: *Benchmarking Western Power's Electricity Distribution Operations and Maintenance and Capital Expenditure*: Report Prepared for Western Power Corporation by Meyrick and Associates Pty Ltd, 3 February 2005

Appendix 2: *Western Power: Network cost analysis & efficiency indicators*: Report by Benchmark Economics, July 2005

Appendix 3: *Verification of Western Power Corporation forecasts of demand and energy for the Access Arrangement for the SWIN*: Report for Western Power Corporation, prepared by the National Institute of Economic and Industry Research, March 2005

Appendix 4: *Weighted Average Cost of Capital*: Report prepared by KPMG, May 2005

Appendix 5: *A Framework for Quantifying Estimation Error in Regulatory WACC*: Report for Western Power in relation to the Economic Regulation Authority's 2005 Network Access Review, prepared by Strategic Finance Group Consulting, May 2005

Appendix 6: Pricing Structure for the Transmission and Distribution Network Businesses.

Appendix 7: Report on Western Power's resource constrained transmission and distribution expenditures

Appendix 8: Reasons for modifying the model application and queuing policy

Appendix 9: Reasons for modifying the model capital contributions policy

Appendix 10: Reasons for modifying the model standard access contract