Revised Access Arrangement Information for the Network of the South West Interconnected System

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Executive summary

Purpose and scope of this document

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

Western Power's first access arrangement commenced on 1 July 2006, following the Authority's approval on 26 April 2007[1]. The first access arrangement requires that proposed revisions be submitted to the Authority by 1 October 2008, for a target commencement date of 1 July 2009. In effect, the proposed revisions amend the terms and conditions for access to Western Power's SWIN that were approved by the Authority on 26 April 2007.

To explain and substantiate Western Power's proposed revisions to the access arrangement, the company must also submit to the Authority a document called the "revised access arrangement information". This document is Western Power's revised access arrangement information (henceforth referred to as "the access arrangement information" or "this document"), which explains and justifies the company's proposed revisions to the access arrangement (henceforth referred to as "the access arrangement"). In accordance with the Code, the access arrangement information enables users and applicants to:

(a) understand how Western Power derived the elements of the proposed access arrangement; and

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

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 and the Authority's published *Guidelines for Access Arrangement Information* on 26 June 2008. Western Power has also had regard to the Code objective, 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."

It is proposed that the access arrangement will be effective from 1 July 2009. Western Power will work constructively with the Authority and other stakeholders to ensure that the access arrangement satisfies all of the requirements of the Code and, more particularly, delivers the price and service outcomes that meet the needs of Western Power's customers.

[1] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007.

Recent performance and future challenges

Western Power operates a large and expansive electricity network servicing the majority of the Western Australian population. A map of the South West Interconnected System (SWIS), of which the SWIN is the network element, is included as Figure 10 in section 3 of Part A of this document. The SWIN contains:

- 170 zone substations;
- 6,000 kilometres of transmission lines; and
- nearly 69,000 kilometres of high voltage distribution lines.

It covers vast areas in the South West of Western Australia. 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.

Western Power has made significant advances during the current access arrangement period to deliver safe, reliable network services. These improvements have been made in an environment of unprecedented economic growth and demand for resources, including labour and materials. Western Power believes that these difficult economic conditions will not ease significantly during the forthcoming access arrangement period, presenting an on-going challenge for the company in terms of cost control and resource constraints.

A number of important challenges identified for the first access arrangement period continue to be relevant as the company looks forward to the forthcoming access arrangement period and refines its longer term expenditure plans. In particular, the following issues will affect Western Power's future expenditure:

- There is an on-going need to maintain sufficient network capability to meet growing demand in the SWIS, and the requirements of Independent Power Producers entering the wholesale generation market.
- Western Power must service the increasing demand associated with further urban infill developments.
- The higher-than-expected new connections and network capacity augmentations completed during the first access arrangement period have led to a backlog of work in network replacement and maintenance.
- Significant real increases in labour and materials costs - compared with the first access arrangement period - are expected, and have been factored into Western Power's expenditure plans. Western Power's forecast of cost increases is based on a report by Access Economics, which is provided as Appendix 2 to this document.
- Resource constraints during the forthcoming access arrangement period will continue to prevent Western Power from undertaking all works that are required

to eliminate work backlogs, meet demand growth, and meet network integrity and performance commitments. Expenditure must therefore be prioritised over the course of the forthcoming access arrangement period.

These high-level challenges have important implications for the expenditure requirements of the transmission and distribution networks, as well as the service standards that Western Power plans to deliver in the forthcoming access arrangement period. These matters are discussed in more detail in Parts B and C of this document.

Investment strategy and risk management

The objectives of Western Power's network investment strategy are substantially unchanged from the first access arrangement period. In particular, Western Power remains focused on:

- meeting or exceeding customer and community expectations regarding the quality and reliability of electricity supply; and

- delivering outputs that are consistent with sound engineering practice in terms of asset management and stewardship.

However, Western Power is increasingly focused on meeting customers' energy needs through measures such as demand side participation, rather than necessarily delivering the types of network solutions provided by a traditional network business.

In broad terms, Western Power's 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.

In particular, risk management is an important consideration in developing any expenditure plans. Under Western Power's network planning and investment process, the company identifies risk exposure through due diligence programmes, asset audits, analysis of performance history and other specialised risk assessment processes based on probability analysis. 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 Rules are met and that all reasonable efforts are made to comply with relevant legislation, national standards and industry guidelines (including those relating to occupational health and safety, environment and employment). Unfortunately, the practical reality is that 100% compliance remains a stretch target for Western Power as it plans for the forthcoming access arrangement period.

Western Power's ability to deliver an optimal works program during the forthcoming access arrangement period will be limited by resource constraints. Implementation of Western Power's network investment strategy therefore requires careful assessment of these constraints to ensure that the resource-limited works program delivers the

best possible improvements in customer service standards without unduly compromising compliance with safety, environmental and other statutory and regulatory obligations.

In determining the expenditures required to give effect to its network investment strategy in the forthcoming access arrangement period, Western Power has, with the assistance of consultants, Parsons Brinkerhoff (PB):

- derived a detailed unconstrained works program for the period from 2009/10 to 2011/12, designed to eliminate work backlogs, meet demand growth, and meet network integrity and performance commitments;

- carefully evaluated the resource constraints that limit the company's ability to deliver the unconstrained works program;

- prioritised the unconstrained expenditure forecasts to derive an optimised, constrained works program that efficiently manages network performance, safety and other risks, whilst also targeting to deliver modest improvements in customer service in terms of SAIDI performance;

- undertaken a detailed assessment of the deliverability of the constrained works program; and

- put in place a strategy for delivery of the constrained works program.

Western Power's assessment of available resources in the forthcoming access arrangement period has indicated that 88% of the "unconstrained work program" is deliverable. Western Power has introduced important organisational changes that will improve accountability for works delivery across the business. These strategic initiatives and organisational changes provide greater assurance that the substantially increased works program will be delivered efficiently and effectively.

Operating and capital expenditure forecasts

Despite the impacts of resource constraints, Figure 1 below shows that the proposed work program represents a substantial increase on expenditures in the first access arrangement period. The detailed explanation for the required increase in expenditure is provided in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document. The principal reasons for the required increase are:

- the unprecedented growth in electricity demand and the connection of additional generation capacity;

- the on-going impact of previously constrained expenditure;

- more onerous safety, health, and environmental regulations; and

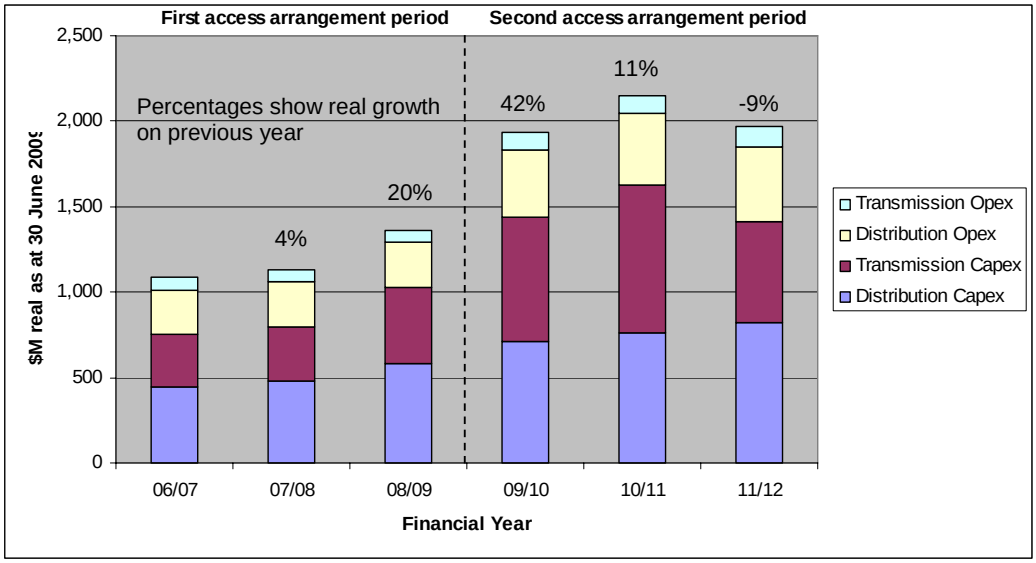
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

In addition:

- asset replacement must be increased to replace those assets that are now overdue for replacement; and

- new zone substations must be established to transfer large amounts of existing network load to address the currently unacceptably high level of substation and feeder loadings.

Figure 1: Overview of actual and forecast expenditures for first and second access arrangement period



It is important to emphasise that Western Power's expenditure plans have been reduced from the level that would be economically justifiable in a world where resources are not constrained. As a result of applying this constraint, Western Power has analysed the risks that would arise if expenditure were reduced below the level now proposed in relation to the following issues:

- planning for electricity demand;
- achievement of reliability targets; and
- meeting customers' connection requirements.

Western Power's risk assessments are summarised in the Figures set out below.

Figure 2: Risk analysis matrix – Failure to Plan for Electricity Demand

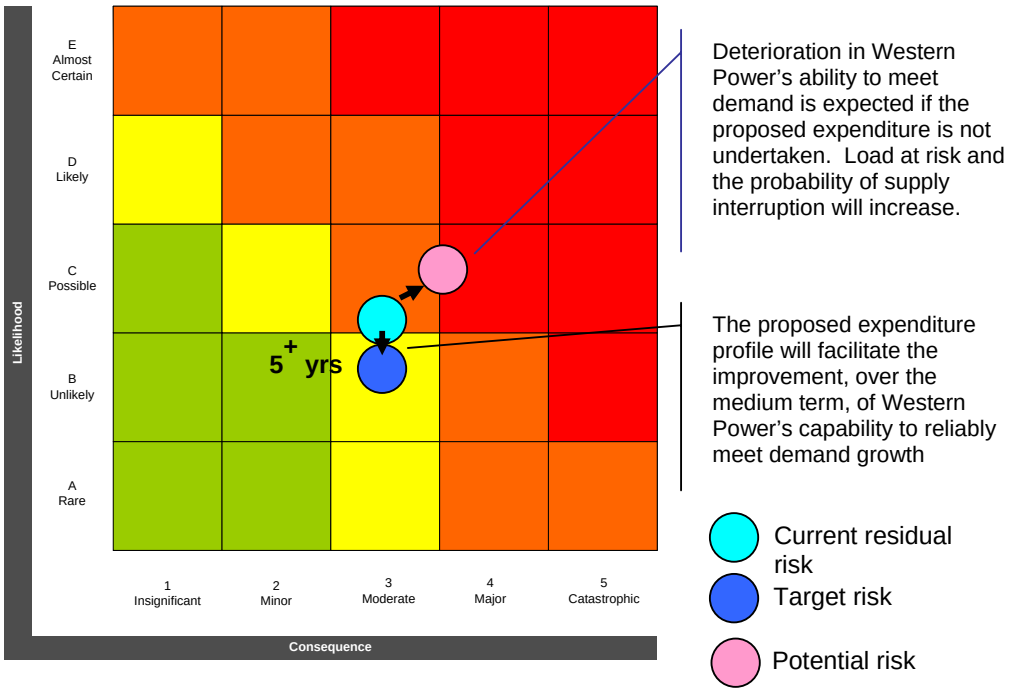


Figure 3: Risk analysis matrix - Achievement of target reliability

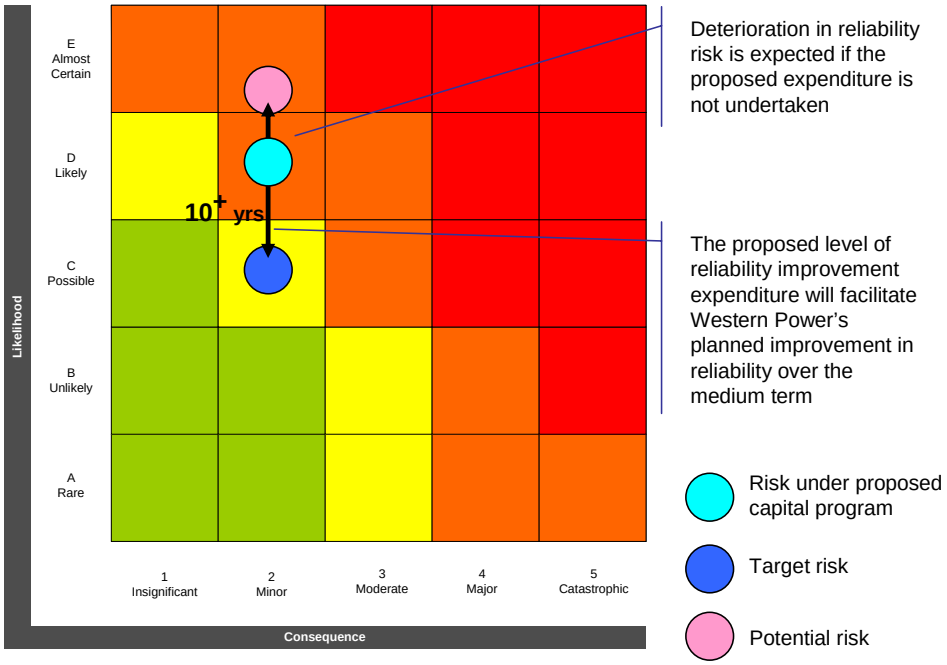
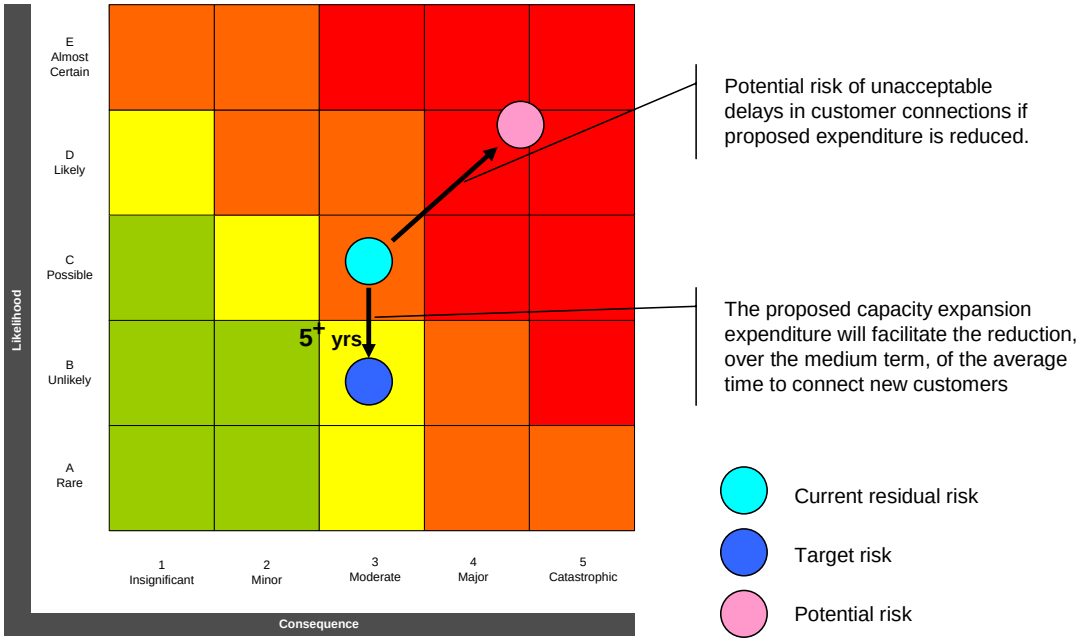


Figure 4: Risk analysis matrix - Customer connections



It is evident from the above diagrams that Western Power's ability to meet the growing demand for electricity; achieve its reliability targets; and satisfy customers' connection requirements would be unreasonably compromised if the proposed expenditure is not undertaken. Western Power has also assessed the risks associated with reductions in its proposed expenditure programs in terms of public safety. It has been found that reductions in the level of proposed expenditure would result in an unacceptable increase in risk exposure in this critical area.

As already noted, Western Power has undertaken a careful assessment of the capability of the company to deliver the proposed works program, taking into account the limited availability of suitable resources to undertake the work. The company has developed a detailed resourcing plan to ensure that it is capable of delivering the planned increases in expenditure. Whilst Western Power recognises that delivery of the planned expenditure program will be a challenge, the company is confident that it has the plans and arrangements in place to deliver the proposed works.

The information presented in this document and the supporting appendices provides detailed substantiation of Western Power's proposed expenditure for the forthcoming access arrangement period, in accordance with the requirements of the Code and the Authority's *Guidelines for Access Arrangement Information*.

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 1: 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 is used to calculate the revenue control which will apply to Western Power. Separate revenue controls will apply to the transmission and distribution reference services. Charges for non-reference services will be determined in accordance with criteria requiring that the charges are: consistent with the Code objective; reasonable; and subject to good faith negotiations.

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").

In its Further Final Decision in April 2007, the Authority determined the respective values of the capital bases for the transmission and distribution networks as at 30 June 2006 to be $1,386.6 million and $1,594.5 million (at 30 June 2006 prices)[2]. Table 2 and Table 3 below show the derivation of the capital base value for transmission and distribution, respectively, as at 30 June 2009 (the date immediately prior to the commencement of the forthcoming access arrangement period).

The tables show the addition of new capital expenditure incurred (or forecast to be incurred) during the first access arrangement period. The Code only provides for such additions to the capital base if the expenditure satisfies the New Facilities Investment Test (NFIT). Western Power is confident that all expenditure incurred

[2] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007, page 11, paragraph 6.1.

and expected to be incurred in the first access arrangement period satisfies the NFIT, and a report from consultants PB supporting this position is provided as Appendix 5 to this document.

Table 2: Derivation of Transmission Capital Base (net) at 30 June 2009 ($ million real as at 30 June 2009)

Financial year ending:	30 June 2006	30 June 2007	30 June 2008	30 June 2009
Opening capital base value		1,523.2	1,776.5	2,035.2
less Depreciation		-53.6	-58.3	-63.3
plus New Facilities Investment		306.9	317.0	443.6
less Redundant Assets		0.0	0.0	0.0
Closing capital base value	**1,523.2**	**1,776.5**	**2,035.2**	**2,415.5**

Table 3: Derivation of Distribution Capital Base as at 30 June 2009 ($ million real as at 30 June 2009)

Financial year ending:	30 June 2006	30 June 2007	30 June 2008	30 June 2009
Opening capital base value		1,751.7	2,088.7	2,454.1
less Depreciation		-106.8	-111.9	-121.4
plus New Facilities Investment		448.0	481.3	582.9
less Redundant Assets		-4.2	-4.0	-3.9
Closing capital base value	**1,751.7**	**2,088.7**	**2,454.1**	**2,911.7**

Western Power's approach to determining the depreciation charge (or "return of capital" allowance) is to adopt a straight-line approach to depreciation.

The WACC is the final critical determinant of the level of Western Power's capital-related costs. The product of the 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. Western Power's view is that the estimated WACC should be the same for Western Power's transmission and distribution networks that comprise the SWIN.

KPMG was commissioned by Western Power to provide specialist advice on the WACC, and KPMG's report is provided as Appendix 6 to this document. KPMG's detailed analysis demonstrates that a reasonable estimate of Western Power's WACC lies in the range of 8.5% to 11.1% real pre-tax (given the interest rates prevailing over the 60 trading day period to 23 June 2008).

Western Power proposes to apply a real pre-tax WACC of 8.95% for the purpose of determining its target revenue for the forthcoming access arrangement period. This value will be subject to revision to reflect the prevailing interest rates and the corresponding 10-year inflation outlook over a sampling period to be agreed (on a confidential basis) between the Authority and Western Power.

The proposed WACC point value of 8.95% real pre-tax lies towards the lower end of the reasonable range estimated by KPMG. In selecting this point estimate, it is noted that:

- Western Power's proposal is consistent with principles espoused by the Ministerial Council on Energy's Expert Panel on Energy Access Pricing, and codified in the National Electricity Rules, regarding the need for regulatory decision-making on the WACC to be both consistent and predictable through time.

- Whilst it is toward the lower bound of the reasonable range estimated by KPMG, the proposed point estimate of the WACC is consistent with maintaining the financial viability of Western Power.

- Western Power's proposal is based on a thorough and robust analysis of the individual parameter values that must be combined to form a point estimate of the WACC that satisfies the requirements of the Code.

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 4 below shows the composition and derivation of the target revenue for the transmission business for each year of the forthcoming access arrangement period. The table also shows the tariff revenue for reference services for the transmission business.

Table 4: Composition of transmission network revenue ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012	Present Value
Operating Costs	100.9	106.0	112.8	269.1
plus Depreciation	74.3	86.1	100.4	218.3
plus Redundant Assets	0.0	0.0	0.0	0.0
plus Return on Assets	216.2	270.4	333.0	683.7
plus Return on Working Capital	0.2	0.3	2.6	2.5
Forward-looking efficient costs	**391.6**	**462.8**	**548.7**	**1,173.6**
less Non-Reference Services Revenue	-6.2	-6.0	-6.3	-15.7
Transmission Reference Service Revenue	**385.3**	**456.8**	**542.4**	**1,157.9**
Deferred Transmission Reference Service Revenue				**14.6**
Smoothed Reference Services Revenue - TR_t	**338.0**	**446.8**	**590.6**	**1,143.3**
Unforeseen events revenue adjustment	0.0			0.0
plus technical rule change revenue adjustment	0.0			0.0
plus investment adjustment mechanism amount	16.4 (Forecast)			15.0
plus capital contribution adjustment mechanism amount	-45.0 (Forecast)			-41.3
Adjustments in accordance with previous access arrangement	**-28.6 (Forecast)**			**-26.3 (Forecast)**
Smoothed adjustments in accordance with previous access arrangement – $AA\#1_t$	**-7.8 (Forecast)**	**-10.3 (Forecast)**	**-13.6 (Forecast)**	**-26.3 (Forecast)**
Tariff Equalisation Contribution – TEC_t	**0.0**	**0.0**	**0.0**	**0.0**
Correction factor from 2008/09 – TK_t	**0.0 (Forecast)**			
Maximum transmission reference service revenue – MTR_t	**330.2 (Forecast)**	**436.5 (Forecast)**	**577.1 (Forecast)**	**1,117.0 (Forecast)**

Following advice from economic consultants, NERA, Western Power proposes to revert to the conventional regulatory treatment of capital contributions in the forthcoming access arrangement period. In the first access arrangement period, Western Power adopted the so-called Queensland Method, which had the effect of artificially depressing price increases in the first access arrangement period. NERA's recommendations will have the effect of creating a one-off increase in Western Power's revenue requirements in the forthcoming access arrangement period.

To effect a transition to the conventional approach to capital contributions and also to manage the price increase in the forthcoming access arrangement period as a result

of Western Power's increased expenditure needs, Western Power has deferred the recovery of $14.6 million ($ real as at 30 June 2009) for the transmission network to the third or subsequent access arrangement periods.

Figure 5 and Figure 6 show the trend in transmission tariff revenues and average transmission tariff prices in real dollars to the end of the forthcoming access arrangement period, which includes the effect of the revenue deferral measure described above.

Figure 5: Trend in Transmission Tariff Revenue in Real Dollars as at 30 June 2009

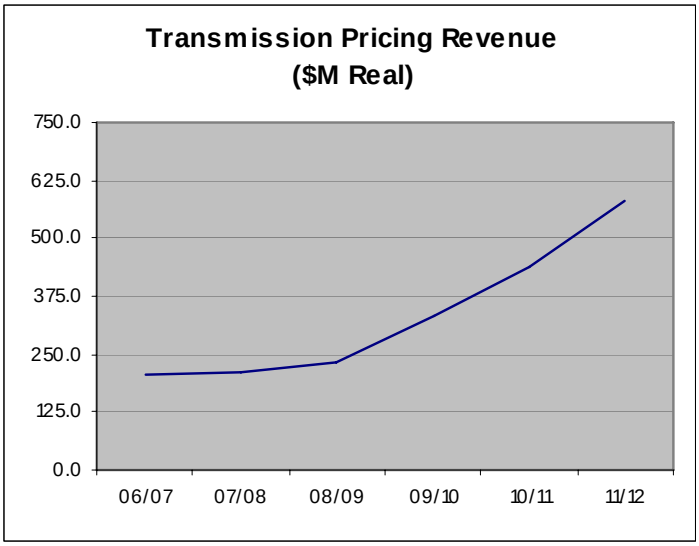


Figure 6: Trend in Transmission Average Price in Real Dollars as at 30 June 2009

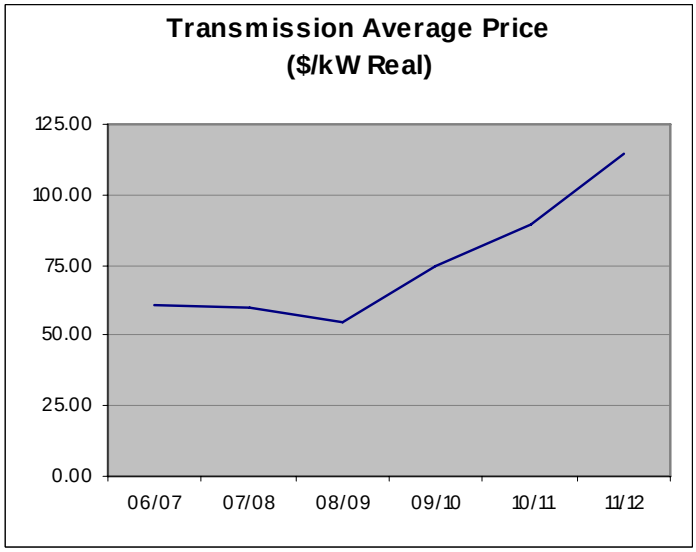


Table 5 below shows the composition of distribution network revenue for the forthcoming access arrangement period.

Table 5: Composition of distribution network revenue ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012	Present Value
Operating Costs	394.0	416.5	436.4	1,049.9
plus Depreciation	146.8	164.7	183.2	415.2
plus Redundant Assets	3.8	3.7	3.6	9.3
plus Return on Assets	260.6	293.7	329.3	741.3
plus Return on Working Capital	4.4	4.9	5.2	12.2
Forward-looking efficient costs	**809.5**	**883.5**	**957.8**	**2,228.0**
less Non-Reference Services Revenue	-4.7	-5.6	-6.4	-13.9
Distribution Reference Service Revenue	804.9	878.0	951.4	**2,214.0**
Deferred Distribution Reference Service Revenue				**177.3**
Smoothed Reference Services Revenue - DR_t	**640.7**	**800.8**	**1,001.0**	**2,036.7**
Unforeseen events revenue adjustment	0.0			0.0
plus technical rule change revenue adjustment	0.0			0.0
plus investment adjustment mechanism amount	32.9 (Forecast)			30.2
plus capital contribution adjustment mechanism amount	-91.6 (Forecast)			-84.1
Adjustments in accordance with previous access arrangement	**-58.8 (Forecast)**			**-53.9 (Forecast)**
Smoothed adjustments in accordance with previous access arrangement – $AA\#1_t$	**-17.0 (Forecast)**	**-21.2 (Forecast)**	**-26.5 (Forecast)**	**-53.9 (Forecast)**
Tariff Equalisation Contribution – TEC_t	**0.0**	**0.0**	**0.0**	**0.0**
Correction factor from 2008/09 – TK_t	**0.0 (Forecast)**			
Maximum distribution reference service revenue – MTR_t	**623.7 (Forecast)**	**779.6 (Forecast)**	**974.5 (Forecast)**	**1,982.8 (Forecast)**

To effect a transition to the conventional approach to capital contributions and also to manage the price increase in the forthcoming access arrangement period as a result of Western Power's increased expenditure needs, Western Power has deferred the recovery of $177.3 million ($ real as at 30 June 2009) for the distribution network to the third or subsequent access arrangement periods.

Figure 7 and Figure 8 show the trend in distribution tariff revenues and average distribution tariff prices in real dollars to the end of the forthcoming access arrangement period. As noted above, Western Power has taken the extraordinary step of deferring $177.3 million (in June 2009 prices) of distribution revenue until the

third access arrangement period. The prices set out below include the effects of this revenue deferral.

Figure 7: Trend in Distribution Tariff Revenue in Real Dollars as at 30 June 2009

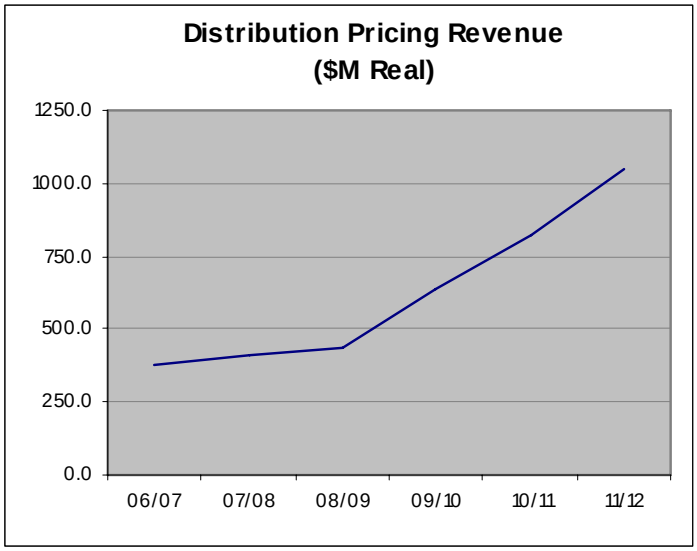
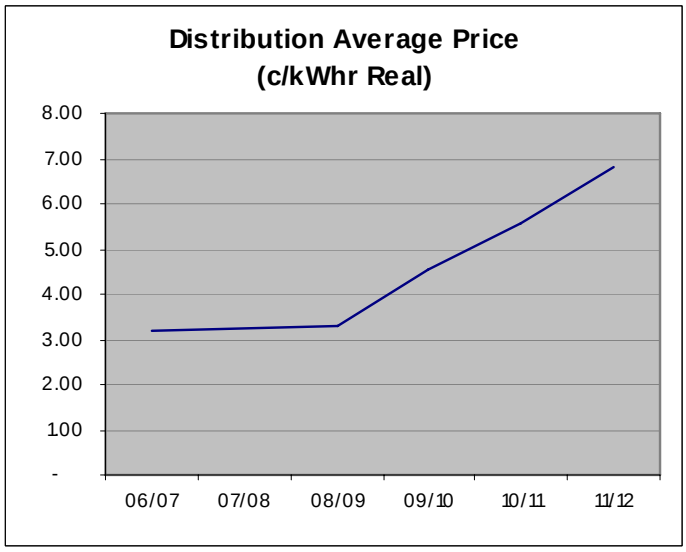


Figure 8: Trend in Distribution Average Price in Real Dollars as at 30 June 2009



Tariffs and service offerings

Under the Code, Western Power is required to offer "reference services"[3]. Western Power is not proposing any material change to the reference services established in the first access arrangement period.

[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.

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.

In the forthcoming access arrangement period, Western Power is proposing to introduce a D-factor scheme, which will provide scope for the company to recover the efficient costs associated with demand side initiatives. As an energy solutions business that is focused on delivering sustainable solutions, Western Power believes that inclusion of a D-factor scheme is an important development.

Western Power is also proposing a Service Standard Adjustment Mechanism that will place ½% of revenue at risk if the company does not meet its service standard targets in the forthcoming access arrangement period. This mechanism is intended to provide assurances to stakeholders that Western Power remains committed to, and accountable for, improving reliability from its current level.

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:

- the Applications and Queuing Policy provides a framework for processing applications for an access contract in an orderly and fair manner, especially where network capacity is scarce;

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

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

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

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

- the 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, and the company's experiences during the first access arrangement period. In a number of respects Western Power

has proposed changes to the contracts and policies that were approved by the Authority for the first access arrangement period in order to better facilitate the achievement of the Code objective.

Submission and approval process

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). In accordance with section 4.12 of the Code, Western Power's view is that the Authority should approve the access arrangement.

PART A: INTRODUCTION AND BACKGROUND

1 Introduction to Part A

In April 2007, the Authority handed down its Further Final Decision in relation to Western Power's proposed first access arrangement, in accordance with the Code.

In accordance with section 4.48 of the Code and Western Power's current access arrangement, this document is Western Power's proposed revised access arrangement information ("access arrangement information"). It explains and justifies the company's *proposed revisions to the access arrangement* ("the access arrangement") that will apply from 1 July 2009 (the "second access arrangement period", or the "forthcoming access arrangement period"). Under the Code, the purpose of access arrangement information is to enable users and applicants to:

(a) understand how Western Power derived the elements of the proposed access arrangement; and

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

In light of this overarching requirement, Part A of the document provides important background information and context to Western Power's proposed access arrangement. 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;
- section 4 presents an overview of Western Power's network planning and investment processes;
- section 5 provides a brief overview of Western Power's proposed expenditures for the forthcoming access arrangement period, and describes the company's strategy for ensuring the timely and efficient delivery of the works program; and
- section 6 describes Western Power's recent service performance and its target performance for the forthcoming access arrangement period.

The remainder of this document 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 The Access Code and development of 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 regulatory reform and structural change in recent years. The broad objective of industry reform is to provide Western Australians with safe and reliable electricity at competitive prices. The State Government's reform programme is delivering a more competitive electricity industry, both in the generation and retail sectors.

The Code[4] was gazetted on 30 November 2004 and commenced on the same day. A number of amendments to the Code have subsequently been made. The introduction to the Code explains that:

> "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."

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

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

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

2.2 Western Power's approach to preparing the proposed revisions to 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 of the Code describe the purpose and content of the access arrangement information in the following terms:

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

"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."

Section 4.5 of the Code provides for the Authority to publish guidelines setting out in further detail what information must be included in the access arrangement information in order for the access arrangement information to comply with sections 4.2 and 4.3, either generally or in relation to a particular matter or circumstance. Pursuant to section 4.5 of the Code, the Authority published *Guidelines for Access Arrangement Information* on 26 June 2008. The Authority's guidelines apply to Western Power's access arrangement proposals for the forthcoming access arrangement period.

In developing the proposed revisions to the access arrangement and this accompanying access arrangement information, Western Power has sought to address all the relevant provisions of the Code and the requirements of the Authority's *Guidelines for Access Arrangement Information*. 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 are the recent developments in the regulation of electricity transmission and distribution businesses in the National Electricity Market, where new Rules have been introduced.

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 objective, as defined in section 2.1 of the Code, in guiding the proposed revisions to 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 prescribes the approach that Western Power must adopt. To assist users and applicants in understanding where the Code mandates a particular approach, this document reproduces the relevant Code provisions, where appropriate.

3 An overview of Western Power

3.1 Introduction

This section provides high-level background information on Western Power and the operation of its network business. It therefore 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 document.

The remainder of this section is structured as follows:

- section 3.2 provides a brief overview of Western Power and the network that is covered by the Code; and

- section 3.3 presents a summary of Western Power's recent initiatives and achievements, and the future challenges facing the company in the forthcoming access arrangement period.

3.2 Brief overview of Western Power

As noted in section 2.1 above, as part of the State Government's program to reform the electricity sector in Western Australia, Western Power Corporation was separated into four new stand-alone energy businesses in April 2006:

- Synergy: The specialist energy retailer that is the point of contact for customers' day-to-day energy needs.

- Horizon Power: A regional power corporation responsible for electricity in all areas outside of the SWIS.

- Verve Energy: The new competitive generation business that produces the bulk of electricity used by consumers in the SWIS.

- Western Power: The 'new' Western Power manages the transmission and distribution networks that transport electricity from power generators to customers.

The changes to the State's electricity industry are part of the Government's reform program aimed at improved accountability, greater network investment, greater focus on core activities and improved service and reliability standards. The new structure also provides a transparent framework for all retailers and generators to gain access to the South West Interconnect Network on fair and reasonable terms. This is important in Western Australia's new electricity market.

Figure 9 below depicts the roles of Western Power, other energy businesses and other agencies in Western Australia's Wholesale Electricity Market.

Figure 9: How Western Australia's Wholesale Electricity Market operates

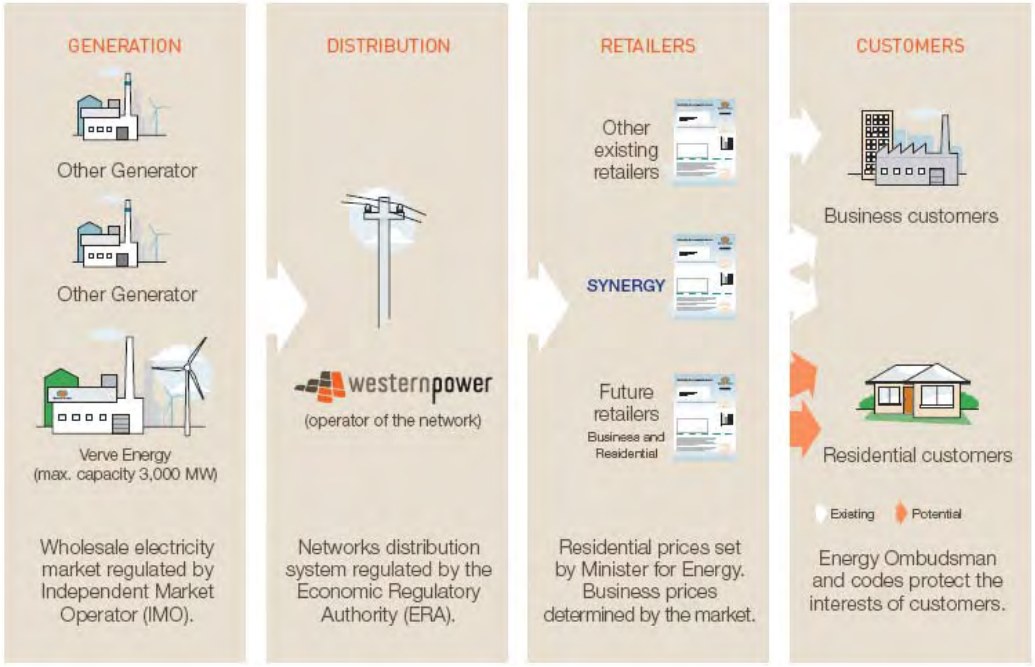


Figure 10 below shows the geographic location of the SWIS within which the South West Interconnect Network (SWIN) is owned and operated by Western Power.

Figure 10: The South West Interconnected System

The SWIN consists of transmission and distribution assets, and it extends from Kalbarri to Albany and across to the Eastern Goldfields. It contains 170 zone substations, approximately 6,000 km of transmission lines (operating at voltages of 66 kV and greater) and nearly 69,000 km of high voltage distribution lines.

Following severe storms in 1994, the Government established the State Underground Power Program. In 1998, following earlier pilot schemes, the program was extended to include major residential projects and the smaller localised enhancement projects with a commitment to having half the Perth metropolitan area serviced by underground power lines by the year 2010. This target is to be achieved through a combination of the program and new property subdivisions that must only use underground power.

Table 6 below provides a summary of the key features of the SWIN.

Table 6: Key features of the South West Interconnected Network

Item		Value
Peak Demand Summer / Winter (MW)		3,420 / 2,920
Energy Transmitted/Delivered (GWh pa)		14,500
Number of customers (power meters)		994,200
Customers per km of line (average number)		10.1
Transmission Lines Length (km)	330 kV	795
	220 kV	655
	132 kV	4,290
	≤ 66 kV	1,052
HV Distribution Feeder Length		68,900
LV Distribution Feeder Length		21,200
Demand (kW) per km of Line (Distribution)		46
Bulk Transmission Substations		23
Zone Substations		170
Distribution Substations		11,400
Installed capacity of distribution transformers (MVA)		6,218
Number of Streetlights		213,100

Note: data is approximate as at 30 June 2008

3.3 Western Power's recent initiatives and the challenges ahead

In its first access arrangement submissions to the Authority[5], Western Power identified the following high-level challenges:

- complying with more onerous safety, health and environmental obligations;
- satisfying the demand for network services, including:
  - 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 creates further 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;

[5] Western Power's Amended Access Arrangement Information, April 2007, page 28.

- facilitating market reform through the timely development of systems and processes; and

- delivering cost effective outcomes for customers by efficiently managing resources, including by attracting and retaining specialist staff.

Table 7 below provides a summary of some of the actions taken by Western Power in responding to these challenges during the first access arrangement period.

Table 7: Recent achievements and initiatives

Safety, health and environmental obligations	Western Power has a number of plans, systems and policies in place to manage public safety as well as the safety of staff and contractors. In May 2007, Western Power launched a Public Safety Awareness Plan to increase the public's awareness and understanding of the risks from electricity and the network. Western Power's employees' Lost Time Injury Frequency Rate (LTIFR) and All Medical Frequency Rate (AMFR) were at their lowest levels ever in the 2007-2008 financial year. In 2007-2008, Western Power committed to planting 93,000 native seedlings to offset carbon emissions through the Carbon Neutral Program. A further initiative, branded 'Beat the Peak', operating during the summer period to support more efficient energy use. Western Power's environmental policy ensures that the business' activities are planned and conducted to minimise or avoid any adverse effects on the natural environment. Sustainability principles are taken into account in the route selection of transmission lines.
Satisfying the demand for network services	Western Power introduced a very successful summer preparedness program for 2008, which included an unprecedented $112 million works program to construct five new sub-stations and six new transformers. Other important works include: • upgrading of southern terminal in Jandakot; • installation of new feeders at Padbury, Morley, Waikiki, Kalamunda, Henley Brook, Northam and Bibra Lake; • network reinforcement at Mullalloo, Yanchep and Denmark; • upgrade work at Nedlands, Southern River, Gosnells and Canning Vale; and • replacement of 214 distribution transformers. Western Power has successfully undertaken the regulatory test and new facilities investment test on the Pinjar to Geraldton 330 kV double circuit line prior to commencing construction. This augmentation will provide the additional capacity needed to meet the sustained load growth in the mid West of the State and enable the connection of new power generation and major industrial customers. Increasing the amount of power to the region will also enhance reliability of power supply to the many customers in the mid West of the State. Unfortunately, unexpected delays in the completion of reliability improvement programs (and the lagged effect of these programs in delivering tangible reliability improvements) have meant that reliability performance has not met the target levels proposed in the first access arrangement. These delays are partly the consequence of Western Power's focus on increasing the capacity of the network to address growing load and generation requirements.

Facilitating market reform	During 2006/07, Western Power introduced its new Metering Business System (MBS), which will provide a single database of metering information. MBS will facilitate Western Power's provision and management of metering services to all participants in the new electricity market. Western Power introduced XA/21, which is a new energy management system that allows System Management Operators to view and dispatch generation and manage and operate remote controlled equipment from the East Perth Control Centre. It is a key component in the management of the wholesale electricity market. The system, a replacement for the aging SCADA master station, provides real time operational information to system management, other corporate users and third party users such as the Independent Market Operator (IMO) and Verve Energy. The system takes advantage of the latest web technologies while maintaining the highest levels of data redundancy and security.
Cost-effective outcomes	Whilst Western Power has made every effort deliver cost-effective outcomes, the rapid economic growth in the State has led to unavoidable cost increases and resource constraints. These factors have adversely affected the delivery of Western Power's proposed expenditure programs. Although Western Power has achieved $19.3 million in cumulative savings from its successful 'One Step Ahead' program, these savings have been too small to offset the substantially higher costs of the work programs.

As outlined above, Western Power has made significant advances during the current access arrangement period to deliver safe, reliable network services. These improvements have been made in an environment of unprecedented economic growth and demand for resources, including labour and materials. Western Power believes that these difficult economic conditions will not ease significantly during the forthcoming access arrangement period, presenting an on-going challenge for the company in terms of cost control and resource constraints.

A number of important challenges identified for the first access arrangement period continue to be relevant as the company looks forward to the forthcoming access arrangement period and its longer term expenditure plans. In particular, the following issues will affect Western Power's further expenditure:

- There is an on-going need to maintain sufficient network capability to meet growing demand in the SWIS, and the requirements of Independent Power Producers entering the wholesale generation market.

- Western Power must service the increasing demand associated with further urban infill developments.

- The higher-than-expected new connections and network capacity augmentations completed during the first access arrangement period have led to a backlog of work in network replacement and maintenance as Western Power enters the second access arrangement period. Addressing this backlog presents a major challenge to Western Power, particularly in light of the increasing age of the asset base, and the need for the company to meet increasingly onerous safety and environmental compliance standards.

- Significant real increases in labour and material costs - compared with the first regulatory period - are expected, and have been factored into Western Power's expenditure plans.

- Resource constraints during the forthcoming access arrangement period will continue to prevent Western Power from undertaking all works that are required to eliminate work backlogs, meet demand growth, and meet network integrity and performance commitments. Expenditure must therefore be prioritised to ensure that over the course of the forthcoming access arrangement period, Western Power remains capable of delivering improvements in:

    - customer service standards, in terms of connection timeliness, reliability and quality of supply; and

    - the degree of compliance with safety, environmental and other statutory and regulatory obligations.

These high-level challenges have important implications for the expenditure requirements of the transmission and distribution networks, as well as the service standards that Western Power plans to deliver in the forthcoming access arrangement period. These matters are discussed in more detail in Parts B and C of this document.

4 Network planning and investment processes

4.1 Introduction

In this section, Western Power provides an overview of its network planning and investment processes, which drive the company's expenditure plans. The remainder of this section is structured as follows:

- section 4.2 provides an overview of Western Power's network planning process and the company's governance framework for capital investment;
- section 4.3 outlines the regulations and legislative obligations with which Western Power must comply, and which represent substantial drivers of expenditure;
- section 4.4 discusses the Code's regulatory requirements regarding the prudence and efficiency of network investment; and
- section 4.5 outlines Western Power's network investment strategy and the company's approach to delivering this strategy in the forthcoming access arrangement period.

4.2 Overview of network planning process and governance framework

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 network analysis to assess the ability of each network element to satisfy a number of planning and technical criteria associated with the delivery of 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 the network 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 is 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 demand forecasts contained in the Independent Market Operator's Statement of Opportunities, 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.

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

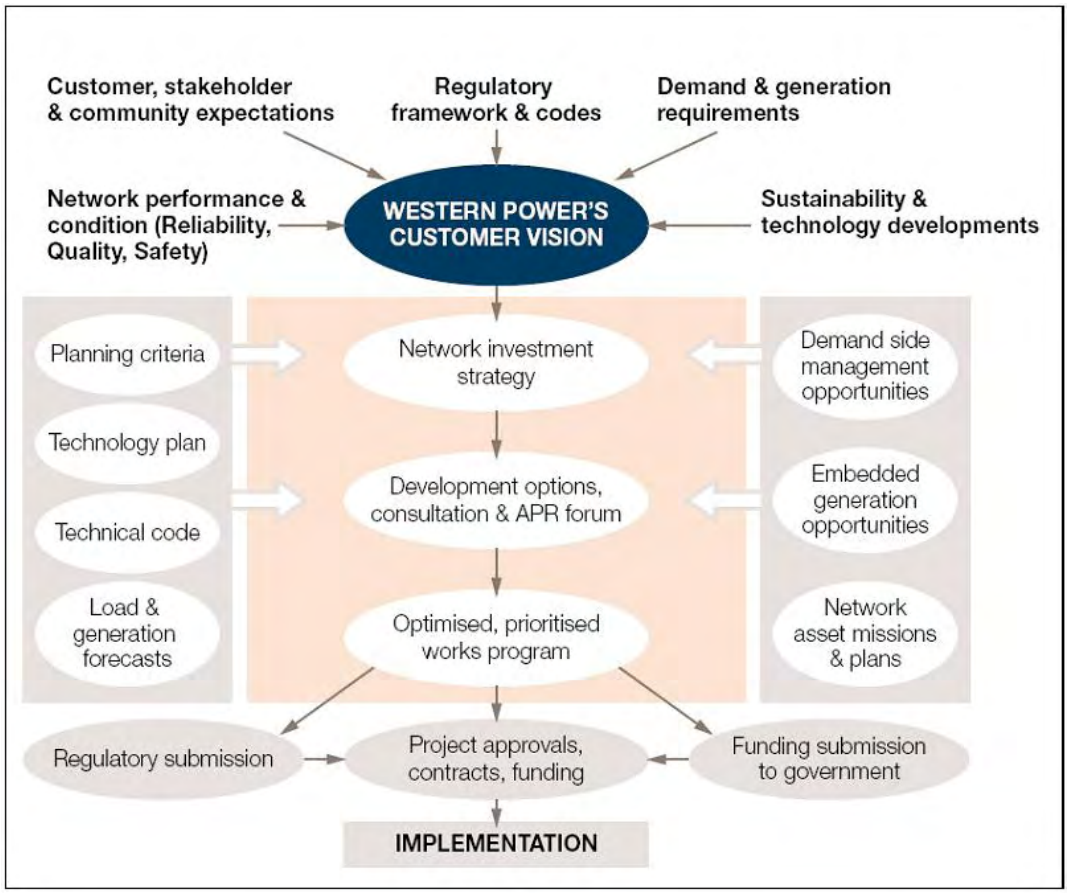
The timing, location and type of generation projects are the other main drivers of network investment. The need for network development is highly sensitive to the location and type of generation development. This is an important source of uncertainty that must be taken into account in developing expenditure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

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 document. 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 Network. An objective of this report is to encourage the development of non-network solutions in response to emerging network constraints.

Figure 11 below provides a summary of the company's network planning and investment process.

Figure 11: Western Power's network planning and investment process



Western Power's governance framework for capital investment and the key supporting documents is depicted in Figure 12. It illustrates that Western Power's governance framework covers all aspects of the capital investment program, including the development of long term strategies, identification and undertaking of specific projects, and review. Specifically:

- Western Power has established a customer vision, which is to further develop as an energy solutions business. This vision provides the company with a much clearer focus on delivering solutions that address customers' energy needs, which may include non-network solutions.

- Expenditure forecasts are based on robust planning processes and are made in accordance with a documented process, taking account of current costs.

- The works approval process is managed by a Capital Works Committee which scrutinises all proposed capital expenditures.

- Expenditures on approved projects and programs of work are subject to monthly review and a documented project management process.

- Project review is undertaken on all projects prior to project close.

Figure 12: Capital investment governance framework and key documents

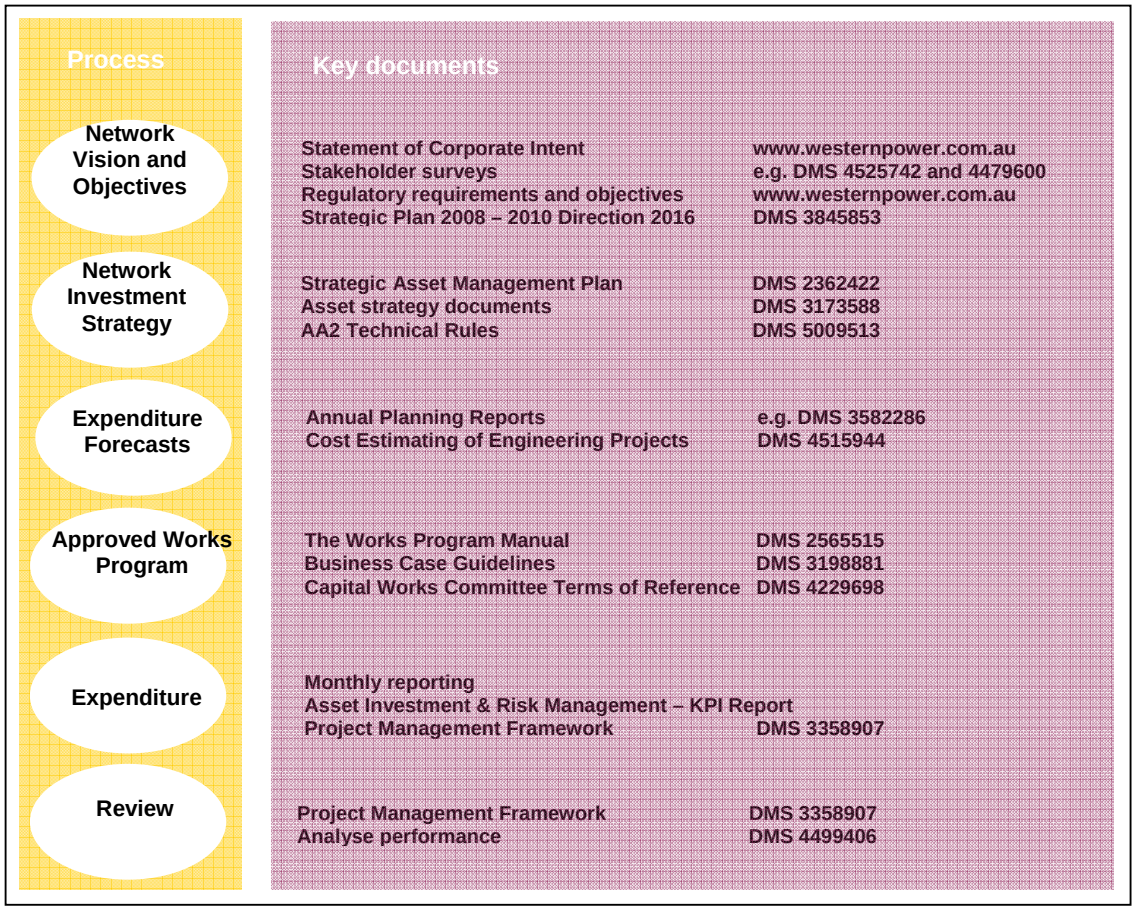


Figure 12 above also illustrates that Western Power maintains a significant number of detailed policies and procedures relating to its capital investment program to ensure that its investment decisions are efficient and prudent. Key activities are performed in accordance with quality systems accredited to ISO 9001.

4.3 Regulations and legislative obligations

Western Power's forecast expenditures for the forthcoming access arrangement period must take account of the costs of complying with the various regulatory and legislative obligations that apply to the company. In broad terms, these obligations impact on the design and operation of the network though requirements relating to public safety, OH&S, environmental management, and power quality.

The applicable regulations and legislation include the following:

- The Electricity Industry (Network Quality and Reliability of Supply) Code 2005 sets targets for outage duration and frequency.
- The Guidelines for the Design, Construction and Maintenance of Overhead Lines 2006 are a significant driver of compliance-related capital expenditure.
- The Technical Rules set out the standards, procedures and planning criteria governing the construction and operation of an electricity network, and the

technical criteria for connection of new users. They also deal with all the matters listed in Appendix 6 of the Code.

- The Environmental Protection (Noise) Regulations 1997 prescribe limits for noise emissions, and methods for noise monitoring and control. It should be noted that lower ambient noise emission levels are now required by the WA Environmental Protection Authority, which imposes more stringent and costly design and construction outcomes for the business.

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

- The 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.

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

Western Power recognises that 100% compliance with these obligations remains a stretch target for the company as it plans for the forthcoming access arrangement period. Whilst these obligations are non-discretionary, Western Power accepts the practical reality that against a number of obligations the company's performance will continue to be less than 100% compliant. This difficult situation has arisen over an extended period as budget constraints, growing demands and tougher obligations have combined to create a compliance gap. Western Power is working hard to bridge this compliance gap and has strategies in place to manage the resulting risk exposures.

The expenditure forecasts in Parts B and C reflect the company's plans to achieve a sustained improvement in compliance during the forthcoming access arrangement period. However, Western Power also acknowledges that the regulatory and legislative provisions listed above may be subject to change over the forthcoming access arrangement period. The cost impact of any such changes cannot be known with reasonable certainty at this time and have not been factored into Western Power's expenditure forecasts.

4.4 Compliance with the Code's investment criteria

The Code establishes a "new facilities investment test" and a "regulatory test", with which Western Power's capital expenditure must comply. The new facilities investment test is defined in section 6.52.

Section 6.52(a) requires that the new facilities investment does not exceed the amount that would be invested by a service provider efficiently minimising costs, having regard, without limitation, to:

(i) whether the new facility exhibits economies of scale or scope and the increments in which capacity can be added; and

(ii) whether the lowest sustainable cost of providing the covered services forecast to be sold over a reasonable period may require the installation of a new facility with capacity sufficient to meet the forecast sales.

Western Power believes that its network planning processes; governance arrangements for capital investment; and its overarching network investment strategy should provide sufficient comfort to the Authority that the company's capital expenditure satisfies the requirements of section 6.52(a). Western Power also notes that its detailed asset management plans and supporting documentation will be made available to the Authority and its consultant to demonstrate compliance with the Code requirements in respect of new facilities investment.

It is also noted that section 6.52(b) of the Code identifies three further elements of the new facilities investment 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.

In terms of forecast capital expenditure, section 6.50(b) of the Code requires that the proposed expenditure is reasonably expected to meet the requirements of the new facilities investment test. To address this question, we examine briefly each of the three elements in section 6.52(b) of the new facilities investment test.

In relation to the first element of (subparagraph (i)) of section 6.52(b) of the new facilities investment test, Western Power's 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 new connection that does not produce sufficient tariff revenue to cover the incremental costs of that connection.

In relation to the second element (subparagraph (ii)) of section 6.52(b) of the new facilities investment test, Western Power notes that its network planning processes and investment criteria are aimed at identifying investment options that maximise net benefits. More broadly, a key strategic objective of the company as it further develops as an energy solutions business is to deliver energy solutions (be they network or non-network) to customers that maximise net benefits.

In relation to the third element (subparagraph (iii)) of section 6.52(b) of the new facilities investment test it is noted that Western Power's planning and investment process takes account of the Technical Rules 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 maintain "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.

Western Power believes that its planning and investment evaluation process complies with the requirements of the test. As noted in further detail in the next

section, the expenditure plans resulting from Western Power's planning and investment process will be further constrained by resourcing and financing considerations. This should provide further confidence that Western Power's capital expenditure program satisfies the requirements of the new facilities investment test. Similarly, the expenditure incurred during the current access arrangement period has also been constrained by resourcing issues, providing further confidence that the actual expenditure incurred is prudent and efficient and satisfies the requirements of the new facilities investment test.

4.5 Network investment strategy and delivery

The objectives of Western Power's network investment strategy are substantially unchanged from the first access arrangement period. In particular, Western Power remains focused on:

- meeting or exceeding customer and community expectations regarding the quality and reliability of electricity supply; and

- delivering outputs that are consistent with sound engineering practice in terms of asset management and stewardship.

As noted earlier in this submission, however, Western Power is now much more focused on meeting customers' energy needs, rather than necessarily delivering the types of network solutions provided by a traditional network business. However, the transition to a fully-fledged energy solutions business will take time.

In broad terms, Western Power's 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. Under Western Power's network planning and investment process, the company identifies risk exposure through due diligence programmes, asset audits, analysis of performance history and other specialised risk assessment processes based on probability analysis. 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 Rules are met and that all reasonable efforts are made to comply with relevant legislation, national standards and industry guidelines (including those relating to occupational health and safety, environment and employment). 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. Unfortunately, as noted earlier, the practical reality is that 100% compliance remains a stretch target for Western Power as it plans for the forthcoming access arrangement period. .

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. Growing network demand and tightening capacity add to the planning challenges, and obtaining the required network outages is increasingly problematic.

Without the 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 maintenance 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 of maintenance expenditure, which include:

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

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.

As noted in section 3.3, Western Power's ability to deliver an optimal works program during the forthcoming access arrangement period will be limited by resource constraints. Implementation of Western Power's network investment strategy therefore requires careful assessment of these constraints to ensure that the resource-limited works program delivers the best possible improvements in customer service standards without unduly compromising compliance with safety, environmental and other statutory and regulatory obligations.

In determining the expenditures required to give effect to its network investment strategy in the forthcoming access arrangement period, Western Power has, with the assistance of consultants, PB:

- derived a detailed unconstrained works program for the period from 2009/10 to 2011/12, designed to eliminate work backlogs, meet demand growth, and meet network integrity and performance commitments;
- carefully evaluated the resource constraints that limit the company's ability to deliver the unconstrained works program;
- prioritised the unconstrained expenditure forecasts to derive an optimised, constrained works program that efficiently manages network performance, safety and other risks, whilst also targeting to deliver modest improvements in customer service in terms of SAIDI performance;
- undertaken a detailed assessment of the deliverability of the constrained works program; and
- put in place a strategy for delivery of the constrained works program.

Section 5 below provides an overview of Western Power's strategy for delivering the proposed works program in light of the resource constraints facing the company.

5 Overview of proposed expenditures and works delivery plan

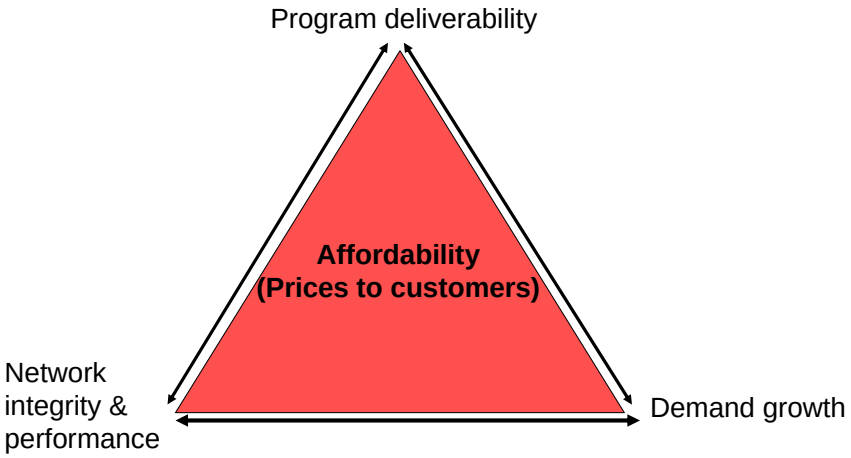
5.1 Introduction

This section provides a brief overview of Western Power's proposed expenditures for the forthcoming access arrangement period, and describes the company's approach to developing its plan for delivering the proposed works in light of the resource constraints it faces. The company's strategic works delivery framework is described, along with the internal governance and organisational arrangements that will support the delivery framework. These organisational developments provide greater assurance that the substantially increased works program will be delivered efficiently and without significant delay.

5.2 Overview of proposed expenditures

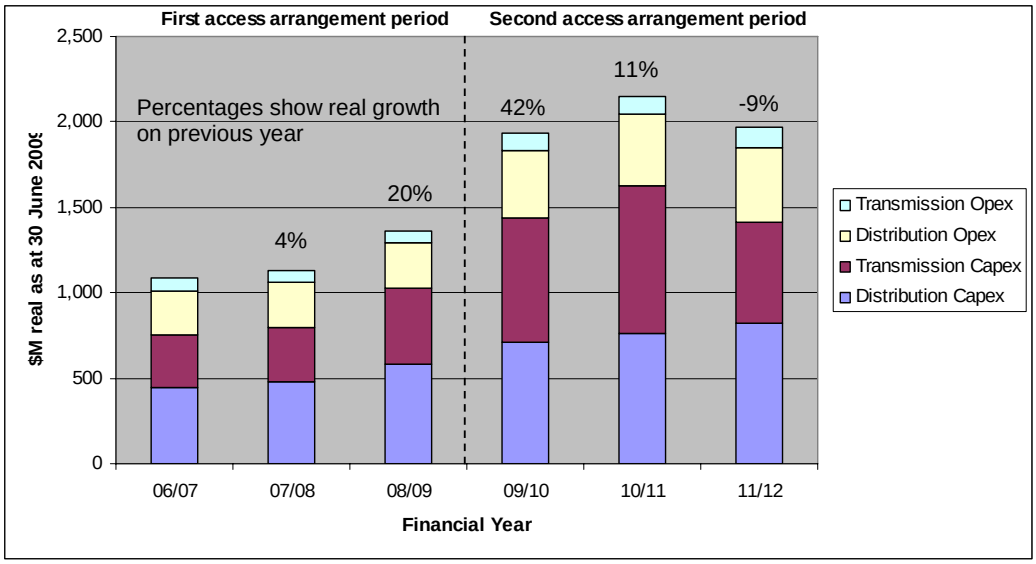
Following Western Power's assessment of available resources in the forthcoming access arrangement period, the company has determined that 88% of the "unconstrained work program" is deliverable. In determining the necessary reductions to be applied to the unconstrained program, Western Power prioritised all work following analysis of the risks and consequences of deferring projects and reducing expenditure. As shown in Figure 13 below, Western Power also needed to balance a number of competing considerations in determining its final expenditure proposals for the forthcoming access arrangement period. In particular, the challenges of program delivery need to be weighed against the need to satisfy demand growth whilst maintaining the integrity and performance of the existing network. These competing objectives also need to be examined in the context of affordability to customers.

Figure 13: Tensions to be resolved in determining the works program for the forthcoming access arrangement period



Despite the impacts of resource constraints, Figure 14 below shows that the proposed work program represents a substantial increase on expenditures in the first access arrangement period.

Figure 14: Overview of actual and forecast expenditures for first and second access arrangement period



5.3 Western Power's Strategic Delivery Framework

To ensure that Western Power is capable of delivering the transmission and distribution work programs described in detail in Parts B and C of this document, Western Power has developed a long-term Strategic Delivery Framework that addresses issues relating to the resourcing and delivery of the proposed expenditures.

The purpose of the framework is to establish a balanced 'portfolio' of service delivery mechanisms that will maximise Western Power's flexibility to adapt to changing needs and demands, while minimising the cost of delivery.

The three main components of the framework are:

- a balanced portfolio of delivery mechanisms;
- an effective and efficient work allocation system; and
- optimal resource planning.

The Strategic Delivery Framework will also address the following strategic objectives:

- delivering the works program on time and on budget (in accordance with the corporate objective of Operational Excellence);
- increasing the flexibility and commercial acumen of the internal workforce (again, in accordance with the Operational Excellence corporate objective);
- achieving and demonstrating value for money in the delivery of the Works Program;
- maintaining and building the core competencies of the internal operational workforce; and

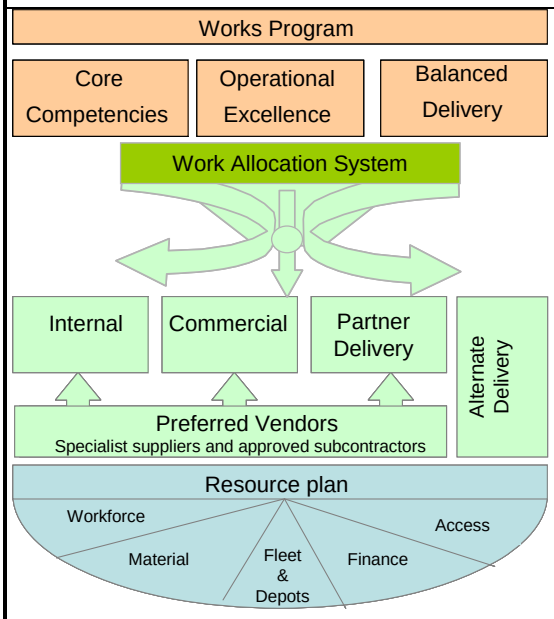
- developing market intelligence and resource plans to match resource demand with supply for the delivery of the entire Work Program.

An overview of the framework is provided in Figure 15 below.

Figure 15: Works Program Delivery Framework

Vision

Ensure the delivery of the work program by applying a systematic delivery framework that takes account of the resources available to Western Power.



Works Program Delivery Framework

The framework represents the objectives and the components that support the delivery of the Works Program.

1. The Works Program is at the top of the framework as it forms the basis under which all of the components and systems are formed. An accurately defined and approved Works Programs is critical for successful delivery.
2. Below the Works Program are the links to the corporate objectives as defined under Operational Excellence - namely Core Competencies, Operational Excellence and Balanced Delivery Portfolio.
3. The middle of the framework forms the systems and processes to enable the Works Programs to be matched to the most appropriate delivery mechanism.
4. The bottom of the framework symbolizes the resources, systems and processes required in delivering the works program

Objectives

- Achieve delivery of works program on time and budget. (Operational Excellence)
- Increase flexibility and commercial acumen (Operational Excellence)
- Benchmark and demonstrate value for money in delivery of the Works Program
- Maintain core competencies of the internal operational workforce.
- Create long-term value for Western Power through a balanced portfolio of delivery mechanisms, incorporating partnerships with industry, standard contracting as well as the internal operational workforce.
- Develop market intelligence and resource plans to match resource demand with supply for the delivery of the entire Work Program.

The Delivery Framework has been developed during the first half of 2008, and the implementation of the three main components of the framework is well underway and will be completed by the end of 2008. The framework will place Western Power in a very strong position to deliver the proposed works program successfully.

5.4 Works delivery mechanisms

In accordance with Western Power's 'balanced portfolio' approach, the company has identified a number of delivery mechanisms that will be employed during the forthcoming access arrangement period. Table 8 below provides an overview of the main delivery mechanisms that Western Power proposes to employ under the Works Program Delivery Framework.

Table 8: Overview of Western Power's main delivery mechanisms

Delivery mechanism	Description
Internal Delivery	Western Power's internal workforce is, and will remain the most dominant delivery mechanism during the forthcoming access arrangement period. Work-force groups with the necessary core competencies will be expanded to ensure that adequate resources are available over the course of the access arrangement period. The internal operational workforce will be directly involved in delivering the proposed works program. It is made up of three key groups: ▪ design and commissioning; ▪ construction and maintenance; and ▪ project and contract management. These operational resources will be supported by internal resources in the areas of: management and strategy, finance, commercial, IT, human resources, legal, health & safety, network planning, performance and technology standards, and customer and stakeholder management.
Partner Delivery Agreements	Western Power has two new Program Alliance Agreements in place. This initiative provides: ▪ new transmission substations; ▪ transmission substation upgrades; ▪ new transmission lines; and ▪ customer funded distribution programs. These arrangements minimise management costs (in terms of project management, tendering, and program monitoring) in an environment of increasing supplier numbers. They also minimise the occurrence of ad-hoc work allocation, which reduces the costs associated with work planning and scheduling. In addition, the arrangements provide Western Power with ready and cost-effective access to key resources in a buoyant labour market.

Delivery mechanism	Description
Commercial Contracts	Western Power is establishing two commercial contract delivery mechanisms. The first is Performance Based Contracting for distribution works which will include overhead and underground construction and maintenance. The second is AS 4000 series contracting has been a key component of Western Power's delivery strategy. It will continue to be used in the forthcoming access arrangement period for engaging resources to undertake ad-hoc transmission customer funded work, minor transmission line projects and for specialized services such as siliconing and insulator washing, vegetation management, inspections, streetlights and state under-grounding programs. Western Power has good relationships with many existing companies in WA and is continually scanning the market for new entrants to WA to assist with its expanding program of works. International supplier interest has also been identified in delivering transmission line projects.
Preferred Vendors	Under this mechanism, Western Power seeks quotes from a panel of pre-qualified suppliers and allocates work on an ad-hoc basis. The preferred vendor model is established and well understood within Western Power. Its primary benefits are that it enables Western Power to readily and cost-effectively engage specialist suppliers in areas such as aerial surveys, traffic management, route selection, environmental reports, cable ploughing, and cable laying. Resources procured under this mechanism can also provide support to the internal workforce and other prime delivery mechanisms.
Alternate Delivery	An alternate delivery option is for customers to build parts of the network which Western Power will ultimately own and operate. This delivery mechanism is usually employed in relation to Western Power's pre-qualified contractors. Other models that are being examined under this delivery mechanism for the forthcoming access arrangement period include the formation of "Task Force Branches" within Western Power.

5.5 Work allocation system and supporting organisational arrangements

In association with the development of the Strategic Delivery Framework, Western Power has also implemented a new work allocation system to manage the program of expenditure proposed for the forthcoming access arrangement period. The system enables the efficient and robust allocation of work, through the following features:

- Work categories are defined in terms of delivery requirements and characteristics, rather than how the work is funded. This ensures that work is delivered by the most cost-effective mechanism.

- A governance structure has been established, under which:

    - pre-determined selection criteria are applied, and these are linked to Western Power's corporate risk analysis framework;

- teams of experts for each work category make recommendations on the allocation of work; and

- a work allocation committee of senior managers reviews and approves the recommendations.

- The system includes a work allocation change management process, to ensure that allocation decision-making builds on lessons gained through experience in relation to the performance of particular suppliers and particular delivery mechanisms.

In addition to the measures outlined above, Western Power has also undertaken an internal re-organisation that will assist in implementing the delivery plan.

Importantly, the new organisational structure provides clear accountability for the delivery of the works programs for both transmission and distribution through a new Service Delivery Division. It also brings together engineering, program management and the operational workforce into fully integrated delivery teams. This will contribute substantially to Western Power's delivery capability over the next access arrangement period.

To ensure that the risk of project delay is managed efficiently, Western Power is developing an enhanced planning process which is an end-to-end business process for managing projects from creation through to commissioning including post implementation reviews. This process will facilitate more effective project management of the works program, particularly by providing visibility of any potential delays in specific projects.

Western Power's support areas are managed in a way that facilitates the most effective means of providing key corporate functions to the operational divisions. This focus on cost-effectiveness has led to restructuring in some areas, as efficiencies and synergies are maximised to provide support as required by the business.

Western Power's support divisions comprise of Finance, Human Resources, Strategy and Corporate Affairs, Legal and Governance and Chief Executive Officer. Together these divisions provide a committed and comprehensive suite of core functions which help to ensure safe, reliable and efficient operations across the organisation. The divisions also provide guidance and leadership for the organisation as it progresses towards its strategic goals as an energy solutions business.

Western Power's business support costs are allocated across the distribution and transmission networks based on the percentage of labour and materials for the non support activities in the overall distribution and transmission forecast. The resulting allocation of overall business support costs is approximately 75% to distribution and 25% to transmission. Further details of Western Power's business support costs are discussed in Parts B and C of this document, and further details are provided in Appendix 1.

5.6 Concluding comments

Western Power's assessment of available resources in the forthcoming access arrangement period has indicated that 88% of the "unconstrained work program" is deliverable. In determining the necessary reductions to be applied to the

unconstrained program, Western Power prioritised all work following analysis of the risks and consequences of deferring projects and reducing expenditure.

To ensure that Western Power is capable of delivering the transmission and distribution work programs described in detail in Parts B and C of this document, Western Power has developed a long-term Strategic Delivery Framework that addresses issues relating to the resourcing and delivery of the proposed expenditures. Western Power has also introduced important organisational changes that will improve accountability for works delivery across the business. These strategic initiatives and organisational changes provide greater assurance that the substantially increased works program will be delivered efficiently and without significant delay.

6 Recent network performance and future service levels

6.1 Introduction

This section presents information on Western Power's recent network performance compared to the targets established in the first access arrangement period. This section also provides details of Western Power's future reliability benchmarks.

Western Power's recent and proposed levels of network performance together have an important bearing on the company's expenditure forecasts that are the subject of Parts B and C of this document. As noted in section 4.5 above, however, limits on the availability of resources during the forthcoming access arrangement period will constrain Western Power's ability to deliver an optimal works program, and inevitably this also limits the company's ability to deliver network service performance improvements over the forthcoming period. In addition, compliance obligations that may not achieve service performance improvements must take priority as scarce resources are managed.

Therefore, resource constraints and work priorities are important factors in determining the service standard targets for the forthcoming access arrangement period. Against this backdrop, the remainder of this section is structured as follows:

- Section 6.2 examines Western Power's recent and proposed transmission network performance, with reference to the performance targets for the first access arrangement period; and

- Section 6.3 examines Western Power's recent and proposed distribution network performance.

6.2 Transmission Network Performance

6.2.1 Recent Transmission Network Performance

Western Power's transmission system has been subject to two performance measures in the first access arrangement period:

- Circuit availability; and

- System Minutes Interrupted.

During the first access arrangement period, Western Power embarked upon a major construction program to extend and expand the transmission system to meet significant increases in projected load growth. Western Power has been managing circuit availability to facilitate this construction in a responsible and prudent manner, balancing the requirements of avoiding costs of restoring circuits unnecessarily and ensuring that system security is not compromised. The most recent data for circuit availability reflects the impacts of recent major construction work, and this work is expected to continue throughout the forthcoming access arrangement period.

Western Power's recent performance for Circuit Availability is shown in Table 9 below.

Table 9: Circuit Availability- recent performance against target

	2005/06	2006/07	2007/08
Circuit Availability (%) actual performance	98.0	97.9	98.2
Circuit Availability (%) target performance	*	98.2	98.2

***** No applicable target in this year

The above table illustrates that Western Power's actual circuit availability has been very stable and close to target in each of the three years shown. In contrast, the other performance measure, System Minutes Interrupted, is an inherently volatile indicator of performance. This is because transmission systems are generally designed to be extremely reliable and customer outages are usually the result of significant events beyond the network service provider's control. When these events do occur the resulting outages typically affect a large number of customers.

Western Power's recent performance for System Minutes Interrupted is shown in Table 10 below.

Table 10: System Minutes Interrupted: recent performance against target

	2005/06	2006/07	2007/08
Meshed Network - Actual performance	5.1	14.2	8.6
Meshed Network - Target performance	*	7.8	7.8
Radial network - Actual performance	0.9	1.4	1.8
Radial network - Target performance	*	3.9	3.9

***** No applicable target in this year

Figure 16 below shows the system minutes interrupted (by cause) over the period from 2004/05 to 2007/08 for the SWIS transmission network as a whole.

Figure 16: System Minutes Interrupted (all SWIS Transmission)

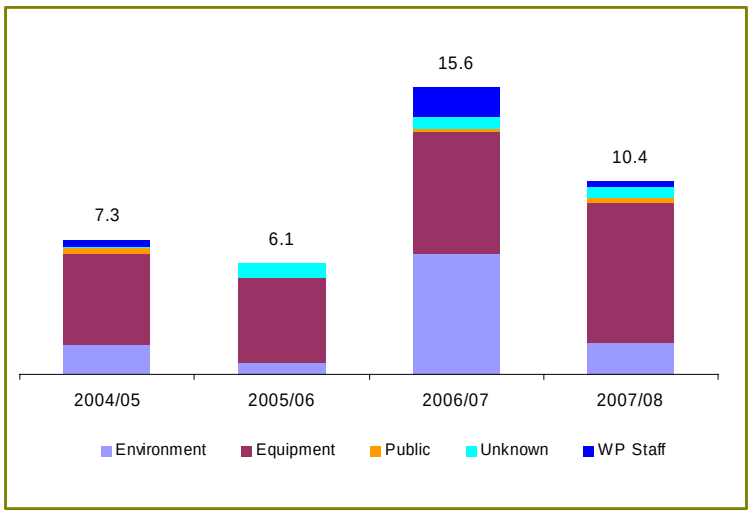


Figure 17 and Figure 18 below show the system minutes interrupted for the period from 2004/05 to 2007/08 (by cause) for the meshed network and radial network, respectively.

Figure 17: System Minutes Interrupted (Meshed Networks)

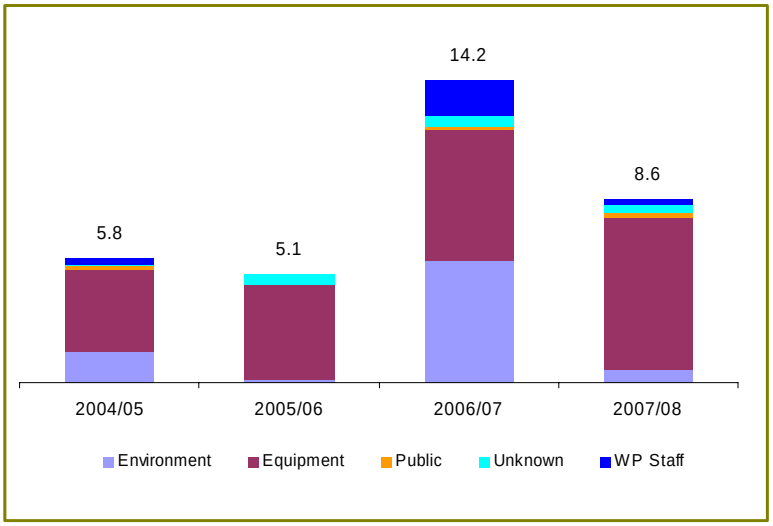
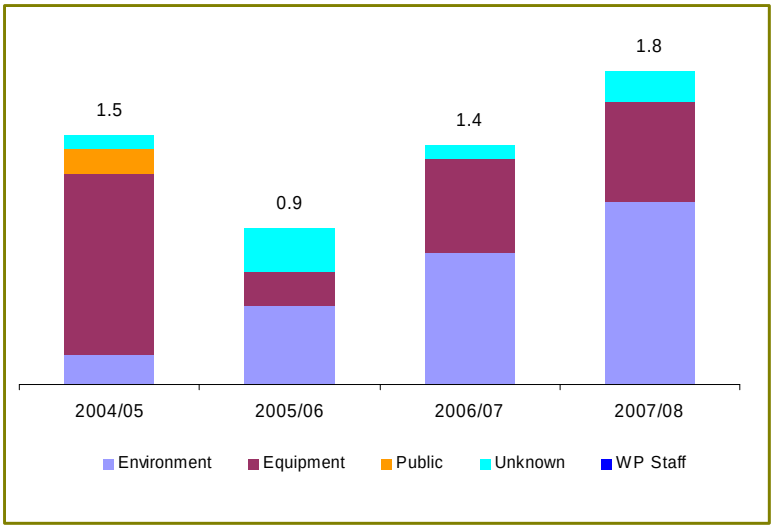


Figure 18: System Minutes Interrupted (Radial Networks)



The data in the above table and figures illustrate the volatility in the System Minutes Interrupted measure, and the apparently poor performance of the meshed network in 2006/07. This performance was predominantly driven by significant outages associated with large scale bush fires. Given the volatility of this performance measure, Western Power believes that a conservative approach should be adopted in setting future service standard benchmarks against this measure.

6.2.2 Future Transmission Network Performance

Western Power's view is that the underlying performance of the transmission network is appropriate and should be maintained. In particular, there are no significant drivers to either improve or relax current transmission service performance targets.

Therefore, Western Power proposes that the transmission service standard benchmarks adopted for the forthcoming access arrangement period should be the average of the actual performance for each of the indicators over the last 3 years. Accordingly, the proposed service standard performance targets for the transmission network for each year of the forthcoming access arrangement period are shown in Table 11 below.

Table 11: Transmission network performance targets for the forthcoming access arrangement period

	Year ending June 2010	Year ending June 2011	Year ending June 2012
Circuit Availability (%)	98.0	98.0	98.0
System Minutes Interrupted (meshed network)	9.3	9.3	9.3
System Minutes Interrupted (radial network)	1.4	1.4	1.4

Further details of the proposed service standard benchmarks and service standard adjustment mechanism relating to Western Power's transmission network are set out in sections 3 and 4 of Part D.

6.3 Distribution Network Performance

6.3.1 Recent Distribution Network Performance

The principal measure of performance of an electricity distribution network is its level of reliability. The *Electricity Industry (Network Quality and Reliability of Supply) Code 2005* sets "aspirational" reliability standards that Western Power must meet, so far as reasonably practicable. Western Power's distribution network performance has fallen short of the reliability standards suggested in the Electricity Industry Code, as shown in Table 12 below.

Table 12: Average duration (minutes) of total Interruptions - historical performance

Feeder type	Target	Historical performance				
		2003/04	2004/05	2005/06	2006/07	2007/08
CBD	30	44	10	11	33	57
Urban	160	283	408	218	264	269
Rural	290	615	552	462	563	599

Note: The data shown above are calculated in accordance with Reliability Code, and differ from the SAIDI performance data calculated in accordance with the approved access arrangement for the first period.

Table 13 and Table 14 below show Western Power's actual performance in 2006/07 and 2007/08 against the SAIDI and SAIFI measures specified in the company's approved access arrangement for the period ending 30 June 2009.

Table 13: Actual performance against SAIDI service standard benchmarks specified in Western Power's access arrangement for the period ending 30 June 2009

		SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2007	**Target**	**277**	**21.4**	**222**	**425**	**741**
	Performance	*275*	*33*	*173*	*406*	*711*
Year ending June 2008	**Target**	**259**	**20.0**	**208**	**398**	**693**
	Performance	*284*	*55*	*207*	*323*	*717*

Table 14: Actual performance against SAIFI service standard benchmarks specified in Western Power's approved access arrangement for the period ending 30 June 2009

		SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2007	**Target**	**3.44**	**0.32**	**3.12**	**4.89**	**5.58**
	Performance	*2.87*	*0.26*	*2.03*	*4.35*	*5.43*
Year ending June 2008	**Target**	**3.22**	**0.30**	**2.91**	**4.58**	**5.22**
	Performance	*2.77*	*0.23*	*2.1*	*3.5*	*5.56*

For the forthcoming access arrangement period, Western Power proposes to adopt definitions of SAIDI and SAIFI that align with the definitions applied by the Steering Committee for National Regulatory Reporting Requirements (SCNRRR) and IEEE 1366 - *Guide for Electric Power Distribution Reliability Indices.* Accordingly, Table 15 and Table 16 below show Western Power's actual performance in 2006/07 and 2007/08 in terms of the SAIDI and SAIFI definitions that the company proposes to apply in the forthcoming access arrangement period.

Table 15: Actual performance - SAIDI specified in accordance with SCNRRR definition

	SWIN total	CBD	Urban	Rural Short	Rural Long
June 2007	229	33	142	329	629
June 2008	230	51	165	260	611
June 2009 *(Forecast)*	*230*	*NA*	*NA*	*NA*	*NA*

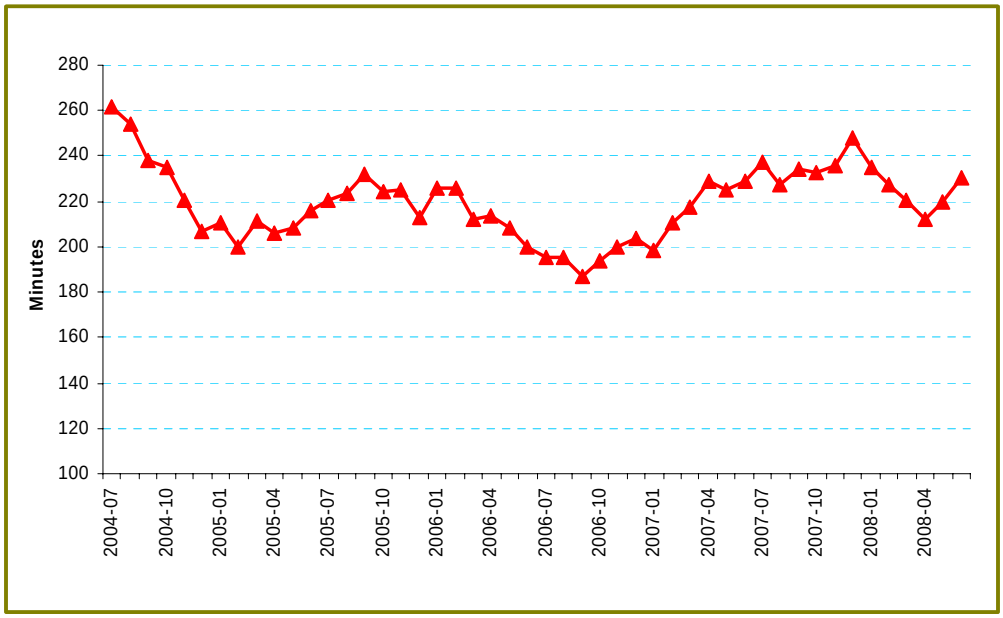
Table 16: Actual performance- SAIFI specified in accordance with SCNRRR definition

	SWIN total	CBD	Urban	Rural Short	Rural Long
June 2007	2.52	0.25	1.80	3.79	4.72
June 2008	2.5	0.22	1.91	3.13	4.99
June 2009 *(Forecast)*	*2.5*	*NA*	*NA*	*NA*	*NA*

For the first access arrangement period, Western Power set a target reliability improvement of 25% of the performance gap between actual performance and the Electricity Industry Code's requirements, with the improvement being implemented in stages over a 4 year period commencing during 2005/06. However, Figure 19 below shows that Western Power's reliability performance in 2006/07 and 2007/08, as

measured by unplanned SAIDI on a rolling 12 month average basis, has not improved over historical levels.[6]

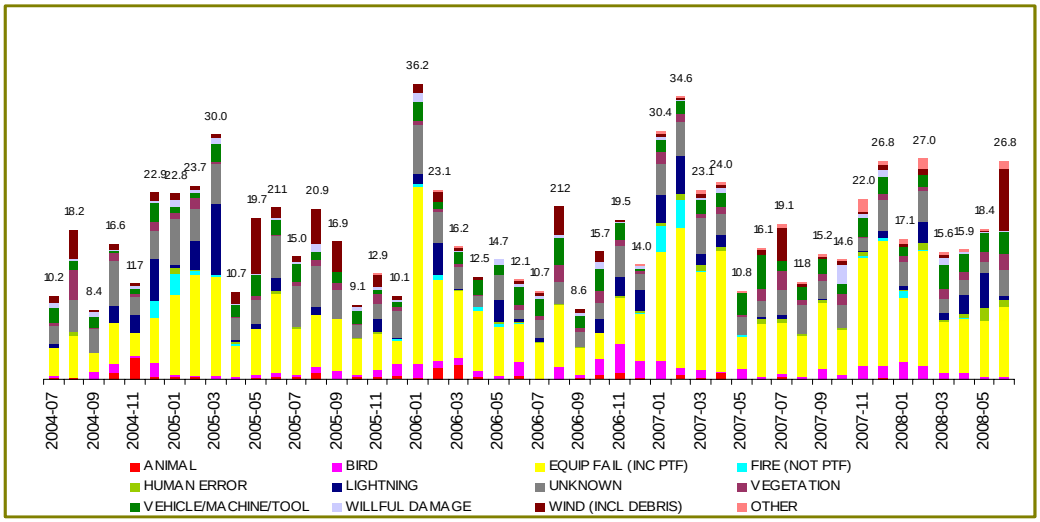
Figure 19: Distribution network, unplanned SAIDI (12 month rolling average)



Note: Excludes major event days and interruptions from customers, generation and transmission.

Figure 20 below shows the SAIDI monthly contribution by cause over the same time period.

Figure 20: SWIS SAIDI monthly contribution by cause



6 SAIDI is measured in this figure using the definition applied by the Steering Committee for National Regulatory Reporting Requirements (SCNRRR) and IEEE 1366 *Guide for Electric Power Distribution Reliability Indices* for major event days known as the Beta method. The Beta method is used to identify major event days which are to be excluded from the minimum service standards in accordance with the definition of SAIDI adopted by the SCNRRR. This definition differs from that applied in Western Power's approved access arrangement for the first period.

In relation to SAIDI performance, the following observations can be made:

- SAIDI has been relatively steady since 2004.

- The improvement in SAIDI performance during mid 2006 is predominantly attributable to mild weather conditions during the 2005/06 summer period and 2006 winter period.

- The deterioration in SWIS SAIDI since that time is predominantly attributable to the Rural Short and Rural Long areas. Urban areas have shown a steady improvement over this time period. Although CBD SAIDI has shown an increase, it is a small distribution network and its contribution to the overall SWIS SAIDI is minimal.

- The most significant cause of unplanned interruptions due to faults on the distribution network has been equipment failure in the Urban network. Outages have typically been attributable to pole top fires, broken conductors, burnt taps and other general overhead equipment problems. Historically, the contribution of equipment failure to SAIDI is most prevalent during the first three months of the calendar year when there is a combination of heat, humidity and light precipitation.

- Other significant causes of outages have been: birds in all parts of the network, asset damage from vehicles (including collisions and excavator damage to cables), vegetation fouling overhead conductors and bushfires (predominantly in Rural Short and Rural Long areas).

While some reliability improvement works have been undertaken during the current access arrangement period, a higher-than-forecast level of customer works in these years has prevented Western Power from fully implementing its reliability improvement works program, with available resources being allocated to higher priority customer works. Improvements are expected in the latter part of 2008/09 due to the installation of automated protection switchgear (reclosers and load break switchgear) and targeted maintenance on the 40 worst performing distribution feeders. Figure 21 below shows the factors that have contributed, or are expected to contribute positively to the reliability performance of the distribution network.

Figure 21: Reductions in customers affected per unplanned distribution interruption due to installation of automated switchgear (12 month rolling average)

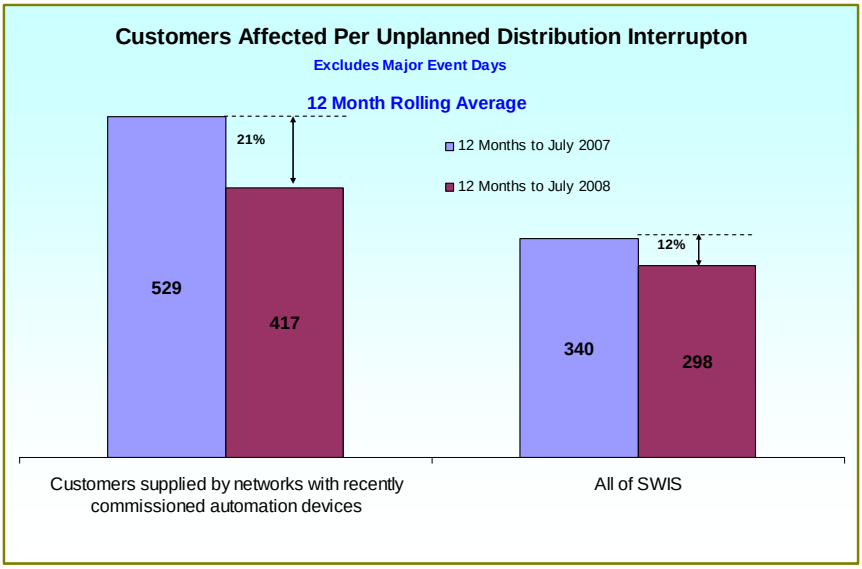


Figure 22 below shows the declining trend in the contribution to SAIDI made by the 40 worst performing feeders.

Figure 22: Percentage contribution of 40 worst feeders to SAIDI (for maintenance faults on overhead HV component of feeders)

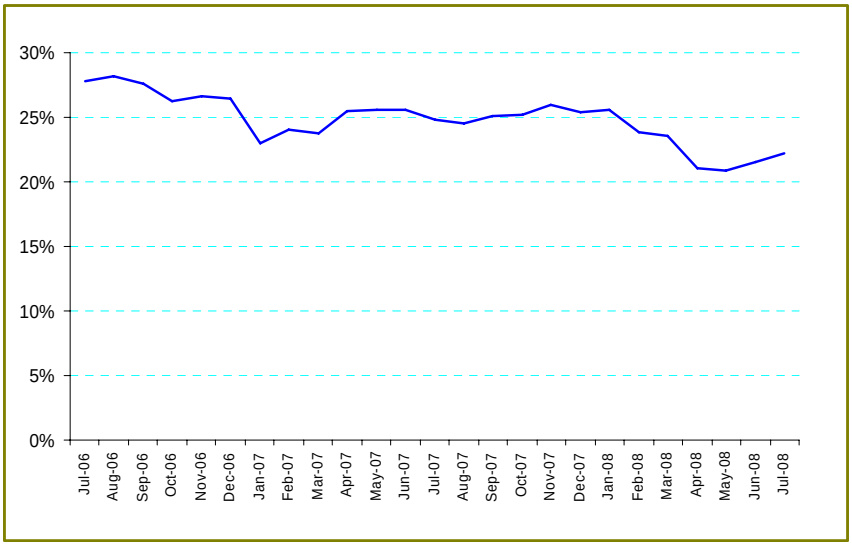


Figure 23 and Figure 24 below show Western Power's recent SAIFI performance.

Figure 23: Recent SWIS SAIFI performance

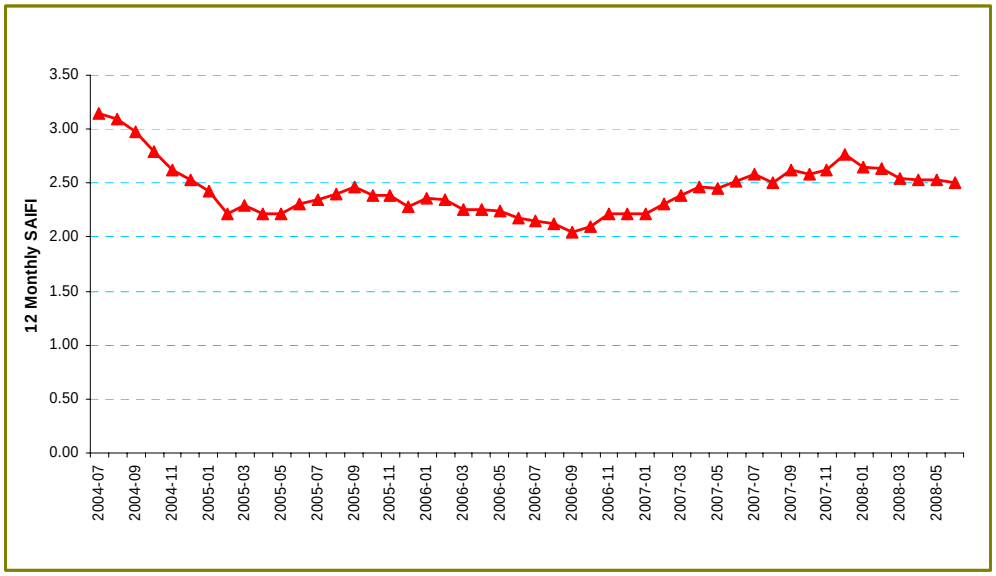
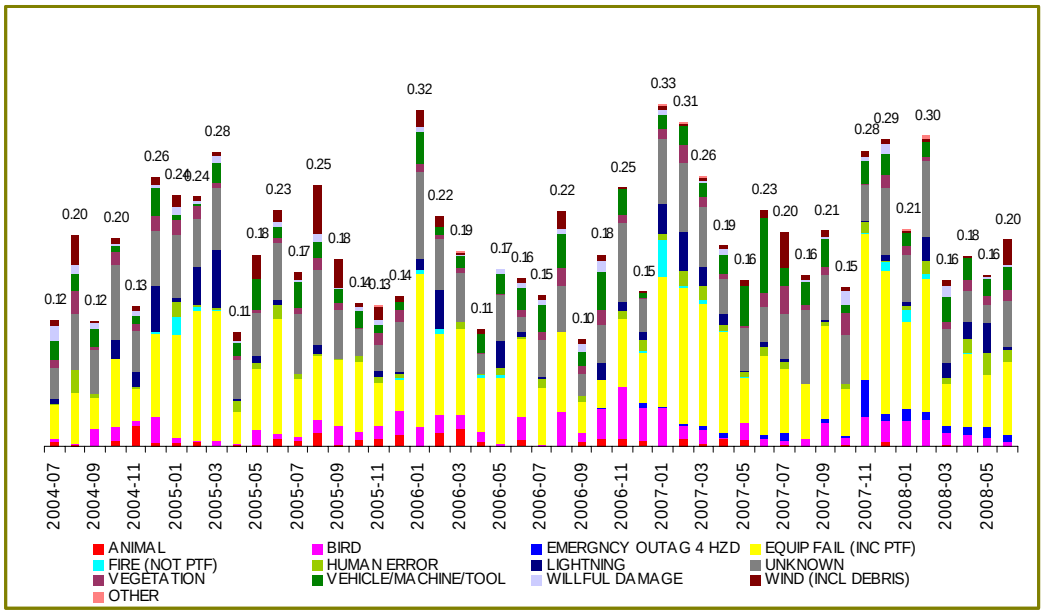


Figure 24: SWIS SAIFI monthly contribution by cause



In terms of SAIFI performance, the following observations can be made:

- The trend and characteristics of SAIFI are very similar to SAIDI with a few exceptions. Unknown causes make up a larger portion of SAIFI than SAIDI. The SWIS SAIDI increase is predominantly attributed to the Rural Short and Rural Long areas with Urban areas showing a steady improvement over this time period.

- The major contributors to the rise in SAIFI since the middle of 2006 have also been: equipment failure in all areas, birds in all areas, asset damage from

vehicles in the Rural areas, vegetation fouling overhead conductors in Urban and Rural Long areas and bushfires in Rural Short and Urban areas.

6.3.2 Future Distribution Network Performance

Over the period since 2003/04, after allowing for the impact of weather variation, the performance of the distribution network has neither deteriorated nor improved. Over that period, Western Power's maintenance and capital expenditure programs have enabled the company to "hold the line" in terms of distribution system performance in the face of high demand growth, increasing asset age, increasing asset utilisation and constraints on the availability of resources to undertake network performance improvement works.

Western Power recognises that there is a need for distribution service performance to be improved from recent historic levels. Accordingly, the company's capital and operating expenditure plans (which involve increases in expenditure compared to recent levels of spending) are aimed at enabling the company to deliver modest but achievable improvements in distribution service performance over the course of the forthcoming access arrangement period.

Western Power has applied a probabilistic approach to determine the improvements in SAIDI it expects to deliver over the forthcoming access arrangement period, taking into account:

- the age and condition of the asset base, and the impact of these drivers on renewals capital expenditure requirements and network performance; and

- the on-going requirement to connect new customers and to deliver customer-driven works in the face of continuing strong demand growth in Western Australia, and the consequential constraint on the availability of resources to undertake performance improvement works.

As explained in further detail below, Western Power is proposing the adoption of SAIDI performance targets for the forthcoming access arrangement period that have a 90% probability of being achieved. This contrasts with the "stretch" targets for distribution system performance adopted for the first access arrangement period, which had a probability of achievement of approximately 40%. Western Power is therefore confident of achieving the proposed SAIDI service standard benchmarks set out below. Indeed, as noted in further detail in Part D of this submission, Western Power has proposed a service standard adjustment mechanism which provides incentives for the company to meet or exceed its service standard benchmarks. Under this proposal, the company will incur financial penalties if it fails to deliver the proposed service performance improvements during the forthcoming access arrangement period.

As noted in further detail in Part C of this submission, detailed expenditure strategies have been developed for the next regulatory period to improve the performance of the distribution network. These strategies focus expenditure on the following areas: lightning mitigation, wildlife proofing, under-grounding first sections, regional power improvement program, targeted reinforcement, targeted maintenance, rogue feeders, pole top fire mitigation, covered conductor, automatic sequence switching, recloser and LBS installation, telemetry, fault indicators, LV upgrade, pole replacement, bushfire management, LV spreaders, pole top replacements and state underground power program.

The reliability improvements expected over the forthcoming access arrangement period have been estimated using a Monte Carlo analysis of the strategies that Western Power proposes to implement. An overall reliability improvement probability distribution is formed using underlying probability distributions for each strategy incorporating worst case, most likely and best case scenarios. For the forthcoming access arrangement period, the SAIDI and SAIFI reliability targets are based on the forecast reliability improvement that should be achieved by implementing the proposed strategies (to a confidence level of 90%).

Calculating the expected reliability improvement by year and by network segment (based on the planned location and timing of the reliability improvement works) has enabled Western Power to determine the SAIDI targets for the forthcoming access arrangement period shown in Figure 25 below[7].

Figure 25: Actual and target SAIDI outcomes

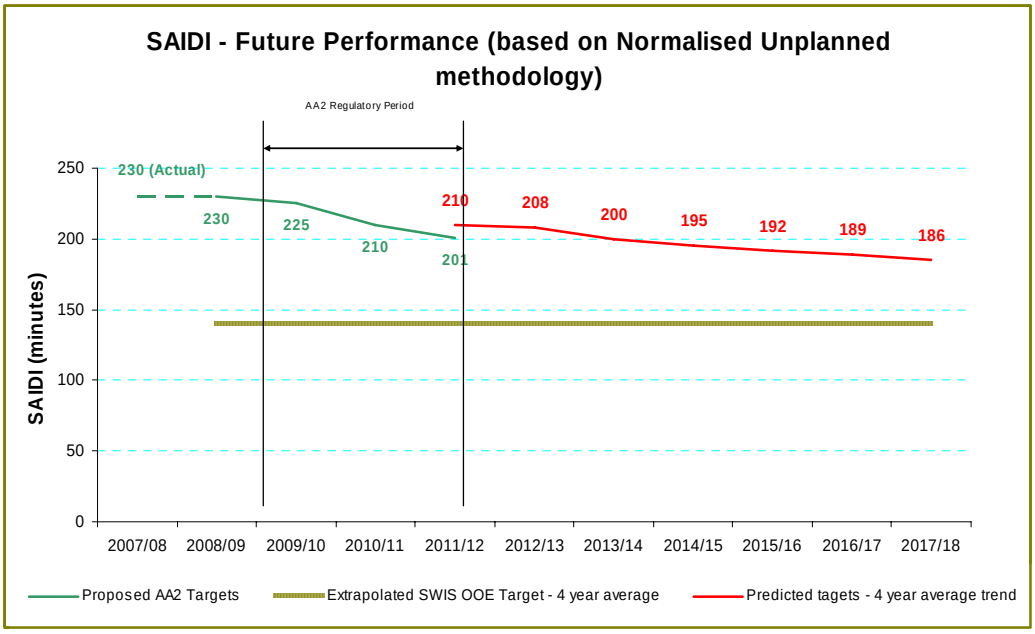


Figure 25 shows that the expected SAIDI performance at the end of 2008/09 is 230 minutes. Western Power's proposed SAIDI service standard benchmarks for the forthcoming access arrangement period represent a staged SAIDI improvement of 29 minutes from the 2008/09 projected performance down to 201 minutes by 2011/12.

As already noted in this submission:

7 As already noted, the SAIDI definition applied here differs from that applied in Western Power's approved access arrangement for the first period. It is understood that the Authority now prefers to measure distribution performance in accordance with the Steering Committee on National Regulatory Reporting Requirements (SCNRRR) Normalised Unplanned methodology, which is consistent with the reporting requirements of the Distribution Operating Licence, as well as the definition adopted by the Australian Energy Regulator in the National Electricity Market. The SAIDI targets for the second access arrangement period are expressed in terms of the SCNRRR Normalised Unplanned methodology. Further details are provided in section 3 of Part D.

- Western Power's ability to deliver improvements in SAIDI performance is limited by the availability of resources to undertake the required performance improvement works;

- the targeted reliability improvement for the forthcoming access arrangement period reflects the best outcome that can be delivered within resource constraints; and

- Western Power is committed to delivering these improvements and will incur financial penalties under the proposed service standard adjustment mechanism if the improvements are not delivered.

In addition to proposing the continuation of SAIDI as a reliability-related service standard measure, Western Power also proposes to continue to apply the SAIFI measure for the forthcoming access arrangement period. Performance will continue to be reported for the following feeder classifications (which are consistent with the SCNRRR classifications):

- CBD;

- urban;

- rural short; and

- rural long.

In relation to the SAIFI service standard benchmarks, Western Power proposes targets for the forthcoming access arrangement period that build on the performance achieved during the first access arrangement period, and which are consistent with the proposed SAIDI improvements.

The reliability-related service standard benchmarks to apply to the distribution network during the forthcoming access arrangement period are summarised in Table 17 and Table 18 below.

Table 17: SAIDI service standard benchmarks for the forthcoming access arrangement period (expressed as system minutes per annum)

SAIDI	SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2010	225	38	161	253	599
Year ending June 2011	210	38	150	233	567
Year ending June 2012	201	38	142	222	548

Table 18: SAIFI service standard benchmarks or the forthcoming access arrangement period (expressed as supply interruptions per annum)

SAIFI	SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2010	2.44	0.24	1.88	3.05	4.89
Year ending June 2011	2.29	0.24	1.76	2.83	4.64
Year ending June 2012	2.18	0.24	1.67	2.70	4.47

Where Western Power is responsible for the repair of faulty streetlights, the service standard benchmarks set out in Table 19 below will apply in relation to repair times for reported faults.

Table 19: Service standard benchmarks relating to repair of faulty streetlights

	Year ending June 2010	Year ending June 2011	Year ending June 2012
Perth Metropolitan area	5 days	5 days	5 days
Major regional towns	5 days	5 days	5 days
Remote and rural towns	9 days	9 days	9 days

Further details of Western Power's proposed service standard benchmarks and service standard adjustment mechanism are set out in sections 3 and 4 of Part D of this document.

PART B: TRANSMISSION BUSINESS EXPENDITURE PLANS AND TOTAL REVENUE

1 Introduction to Part B

Part B of this document 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 set out 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 expenditure[8]). The forecasts also provide the basis for developing the company's proposed prices.

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 document, together with section 2, Part C, is intended to discharge this Code obligation.

The remainder of this section is structured as follows:

- section 2.2 provides an overview of Western Power's methodology for developing transmission demand and energy forecasts;
- section 2.3 presents the transmission demand and energy forecasts; and
- section 2.4 provides concluding comments.

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

Power is transferred across the SWIN 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 voltages of 132 kV and 66 kV.

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 development, 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's 2008 Annual Planning Report (APR) explains that three levels of demand forecasts are required for network planning purposes:

1. Demand forecast for the bulk transmission system, which is broadly based on the demand forecasts reported in the Statement of Opportunities (SOO) published by the Independent Market Operator (IMO), and which allows peak network flows across the bulk transmission network to be modelled. An overall load forecast for the bulk transmission network is the sum of individual

[8] Further details of generation capacity forecasts are set out in section 3 below.

substation forecasts at the time of expected system peak load, corrected to match the demand forecasts reported by the IMO in the most recent SOO, which was published in July 2007.

2. Demand forecasts for each substation, which are developed by extrapolating previous peaks for each substation, and which allow peak power flows across each substation element to be modelled. Western Power's forecasting methodology is based on statistical analysis of historic load information for every substation and Terminal station. Expected block loads are, as appropriate, added to these demand forecasts; and

3. 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, Western Power's planning 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 normally 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 load forecasts relating to the time of system peak would potentially understate the duty of each substation element and lead to inadequate development plans.

2.3 Western Power's transmission demand and energy forecasts

In its 2007 SOO, the IMO made the following observation regarding peak electricity demand on the SWIS during the most recent summer period:

> "Peak electricity demand within the SWIS occurs in the summer and is driven largely by temperature dependent loads. These loads are predominantly air conditioning and space cooling appliances used in both the residential and commercial sectors. For the 2006/07 summer, the maximum demand within the SWIS was 3,364 MW. This occurred on Wednesday 7 March 2007 in the 15:30 Trading Interval (the Trading Interval commencing at 15:30 WST). The maximum temperature recorded by the Bureau of Meteorology for the Perth Metro area was 42.4ºC and this occurred at 15:49 WST. The figure of 3,364 MW is the SWIS sent-out value and is the highest demand ever recorded on the SWIS."

The IMO's forecasting consultant, NIEIR has reported to the IMO that air conditioner sales have increased at a rate higher than expected over the last twelve months, with approximately 200 MW of air conditioner load installed in Western Australia. While some of this new air conditioner load would have been installed outside the SWIS, and some would have been installed due to replacement of older units, this growth represents a significant increase in the temperature-dependent load in the SWIS.

NIEIR also advised the IMO that its forecasts for 2006 under-estimated new air conditioner installations by approximately 65 MW for the 2006/07 period. In its 2007 SOO, the IMO therefore signalled its intention to review NIEIR's forecasting methodology:

> "The IMO is keen to ensure electricity demand forecasts are as accurate and reliable as possible. To ensure that the IMO uses the best possible forecasting techniques, a review of electricity demand forecast methodology is currently underway. An Advisory Committee is assisting the IMO in this review. To further enhance the robustness of demand forecast, the IMO will seek an expert independent review of the forecasting methodology employed by NIEIR."

From Western Power's perspective as a network planner and service provider, three important observations can be drawn from the above discussion:

- During the most recent summer, the highest ever peak demand was recorded on the SWIS.

- The increased penetration of air conditioning units means that maximum demand is more temperature sensitive than in previous periods.

- It is possible that the IMO's review of NIEIR's forecasting methodology may identify a systematic downward bias in previous energy and demand forecasts.

These observations indicate that a cautious approach to network planning should be adopted in the forthcoming access arrangement period, to ensure that customer demand can be met reliably.

Against the backdrop of these high-level observations, the IMO's 2007 SOO made the following forecasts regarding economic growth and electricity consumption:

- Economic growth within the State is forecast to remain strong, with an annual average rate of growth of 4.2% in Gross State Product over the period 2007/08 to 2016/17; and

- Electricity consumption is forecast to grow at 2.2% per annum on average over the period 2007/08 to 2016/17, while maximum demand is forecast to grow at 3.3% over this period.

A more detailed breakdown of the IMO's forecasts for maximum demand and energy is reproduced in Table 20 below[9]).

[9] Independent Market Operator, Statement of Opportunities 2007, appendix 4

Table 20: IMO forecasts of maximum demand and energy

Maximum Demand Forecasts with Expected Economic Growth (MW)

Year	10% POE	50% POE	90% POE
2007/08	3,800	3,521	3,320
2008/09	4,086	3,791	3,580
2009/10	4,233	3,924	3,701
2010/11	4,361	4,037	3,803
2011/12	4,505	4,166	3,923
2012/13	4,633	4,281	4,027
2013/14	4,746	4,380	4,116
2014/15	4,881	4,501	4,228
2015/16	4,985	4,593	4,311
2016/17	5,094	4,691	4,400

Note: 2008/09 Reserve Capacity Year is impacted by the introduction of the Boddington Gold Mine.

Forecasts of Sent-out Energy for the SWIS (GWh)

Year	Expected	High	Low
2007/08	15,878	16,112	15,597
2008/09	17,072	17,443	16,665
2009/10	17,822	18,479	17,201
2010/11	18,173	18,911	17,447
2011/12	18,741	19,708	17,795
2012/13	19,145	20,390	18,061
2013/14	19,417	20,970	18,223
2014/15	19,819	21,905	18,355
2015/16	20,075	22,374	18,553
2016/17	20,437	23,123	18,725

It should be noted that the transmission energy forecasts have minimal impact on Western Power's transmission investment plan. However, energy forecasts are relevant to the determination of transmission and distribution tariffs for the forthcoming access arrangement period.

The forecasts used to develop Western Power's transmission capital expenditure projections for the 2009/10 to 2011/12 regulatory period are developed on the basis of a 10% Probability of Exceedance (PoE) under the expected economic growth scenario. These forecasts align with the 2007 Statement of Opportunities. Distribution capital expenditure projections for capacity expansion projects are based on a 50% PoE demand forecast and the application of this forecast at the high voltage distribution feeder level.

The coincident system peak demand forecast is used to establish the network development plans for the bulk transmission network and each of the defined 13 transmission load areas, while the individual substation (non-coincident) peak demand forecasts are used to develop zone substation augmentation needs.

The coincident system peak demand forecasts are summarised at an area level in Table 21 below.

Table 21: Area-based demand forecasts (MW) used to develop the 2009 regulatory period capex projections.

Area	07/08	08/09	09/10	10/11	11/12	12/13	13/14
Bunbury	290	303	318	332	351	359	390
Cannington	289	332	333	364	374	384	392
East Country	107	122	129	134	163	168	172
Eastern Goldfields	90	105	116	120	124	128	132
East Perth	325	359	350	363	371	378	386
Guildford	146	178	170	179	173	179	185
GT	0	0	30	34	39	43	47
Kwinana	281	311	319	348	363	376	369
Muja	142	143	303	310	319	326	332
North Country	166	163	181	180	187	197	209
Northern Terminal	786	896	968	1,011	1,055	1,098	1,138
South Fremantle	203	230	243	257	265	273	281
South Terminal	352	389	407	423	417	431	446
West Terminal	182	193	184	175	183	192	200
Total	3,724	4,052	4,229	4,382	4,531	4,678	4,836
Growth	10.8%	8.8%	4.4%	3.6%	3.4%	3.2%	3.4%
IMO 10%PoE, expected economic growth	3,800	4,086	4,233	4,361	4,505	4,633	4,746

2.4 Concluding comments on energy and demand forecasts

This section has explained that:

- Western Power requires demand and energy forecasts for the bulk transmission system, for substations and for load areas in order to determine its network investment requirements.

- For the forthcoming access arrangement period, Western Power has ensured that its energy and demand forecasts reconcile to the forecasts published by the IMO in its 2007 SOO.

- The IMO has reported that increased penetration of air conditioning units in the SWIS contributed to maximum recorded summer demands in 2007 and to an increasingly temperature-sensitive network demand.

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 network. 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 directly influence the location, timing, and size of new generation plant connecting to its network. Following the establishment of Western Australia's Wholesale Electricity Market in 2006, Western Power has entered a period of much greater uncertainty with respect to generation connection capital expenditure, in terms of connection costs, and shared network augmentations.

The remainder of this section is structured as follows:

- section 3.2 discusses the supply and demand balance on the SWIS;
- section 3.3 sets out Western Power's assumptions regarding new generation connections; and
- section 3.4 provides concluding comments.

3.2 Supply and demand balance in the SWIS

The IMO's SOO analyses the supply-demand balance in the SWIS. In its 2007 report, the IMO concluded that in order to meet the forecast growth in electricity consumption and maximum demand, 4,609 MW of generation and demand side management capacity will be required for the 2009/10 Reserve Capacity Year. This represents an increase of 167 MW from the previous Reserve Capacity Year.

Figure 26 below is an excerpt from the IMO's SOO. It illustrates the expected status of generation and DSM capacity in the SWIS in the 2009/10 Reserve Capacity Year. Generation and DSM capacity expected to be available from existing facilities, and facilities already under construction totals approximately 4,384 MW. The Reserve Capacity Target is 4,609 MW for the 2009/10 Reserve Capacity Year, indicating approximately 225 MW of new generation and DSM capacity to be procured through the Reserve Capacity Mechanism.

Figure 26: Outlook for generation and DSM capacity in the SWIS in the 2009/10 Reserve Capacity Year

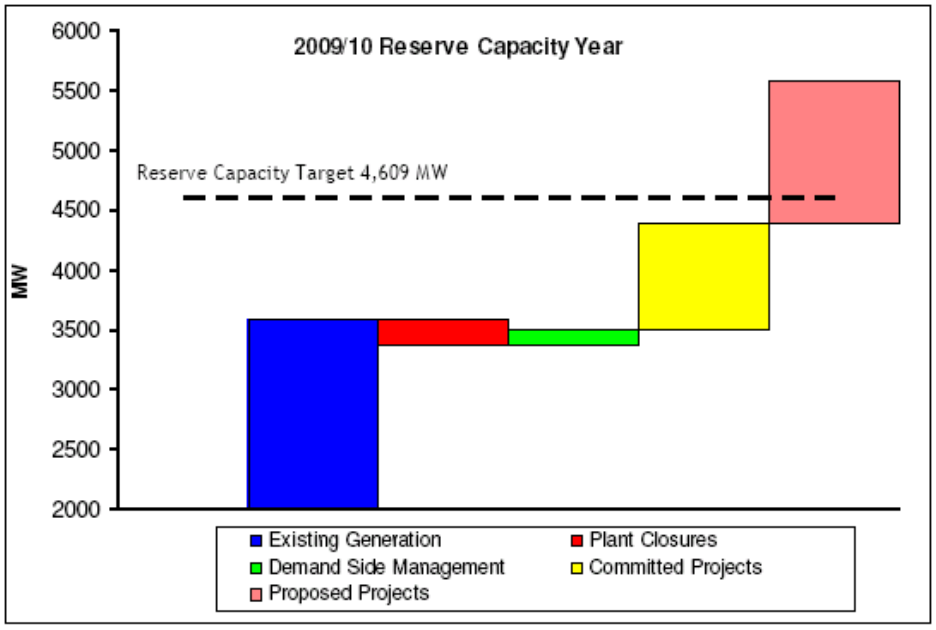
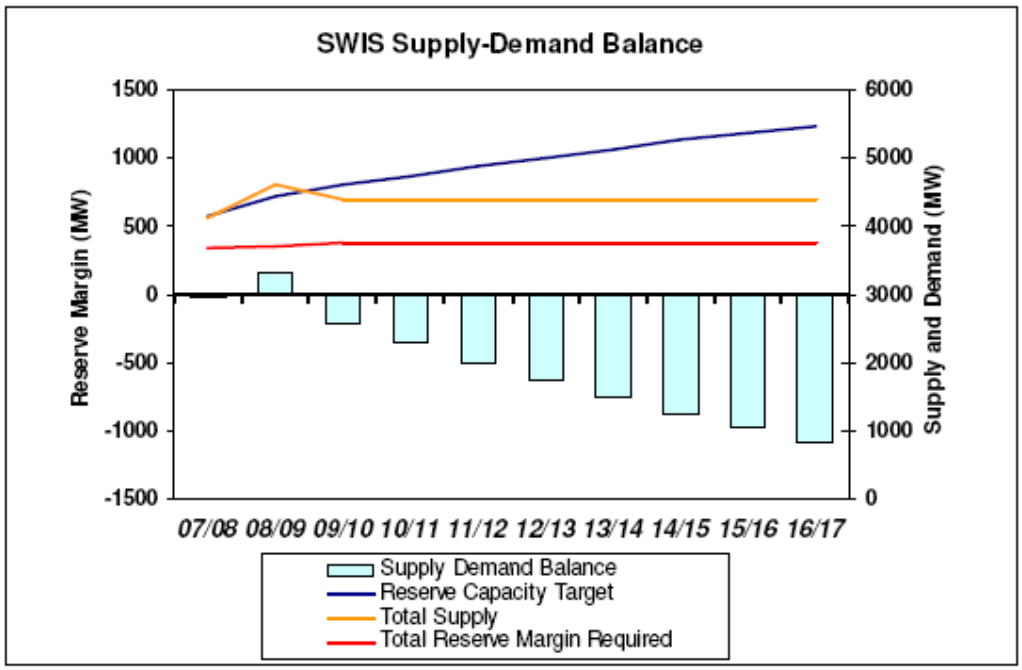


Figure 27 below is also an excerpt from the IMO's 2007 SOO. It illustrates the longer-term supply-demand balance, and thereby provides an indication of investment opportunities. Figure 27 indicates that there are opportunities for investment in new generation and DSM facilities from 2009/10 onward.

Figure 27: Longer-term supply-demand balance in the SWIS



The IMO's projections provide a good indication of the quantum of new generation capacity that must be connected in the SWIS during the forthcoming access arrangement period and beyond.

As already noted, however, the establishment of a competitive generation market introduces a new dynamic into transmission network planning. Western Power's recent experience is that new generation connections will tend to be of a smaller size and/or in new locations compared to those that took place prior to the commencement of the wholesale generation market. The relatively small and diverse nature of new generation capacity places additional resourcing requirements on Western Power in planning and delivering the necessary increases in system capacity.

3.3 Western Power's forecast generation connection requirements

Western Power has adopted the following methodology to determine its forecast of new generation connections in the forthcoming access arrangement period:

- Generation projects that have been assigned capacity credits as part of the Reserve Capacity Mechanism process have been included.

- Committed generation projects - that is, those for which an access agreement has been signed - have also been included.

- If additional generation capacity is required in order to maintain the appropriate minimum reserve margin, projects in the access application queue are given the next priority, and they are further prioritised based on Western Power's assessment of the probability of the project proceeding (having regard to the size of the project and its impacts on the surrounding area).

- If further additional generation capacity is required, beyond that available in the access application queue, additional generation is added to the base case. In these circumstances, the assumed location of the additional generation is based on proposals and key factors such as fuel availability.

- Relatively small capacity projects that do not (materially) contribute to improving the supply-demand balance, and projects where the cost of connection is likely to be prohibitive, are excluded.

Based on this methodology, Western Power defines a generation development program for transmission planning purposes. Table 22 below shows that under the generation development program, some existing generation plant is retired in 2008/09 and 2009/10, and there will be a requirement to develop around 1,700 MW of new generation capacity prior to summer 2012/13.

Table 22: Generation development program (MW) underpinning Western Power's transmission development analysis

Area	07/08	08/09	09/10	10/11	11/12	12/13	13/14
Existing generation	3931	3931	4266	4646	4866	4946	5246
Known retirements							
Kwinana B		(189)					
Kwinana A			(199)				
Committed generators							
Bluewaters 1		204					
New Gen Kwinana		320					
Bluewaters 2			204				
New Gen Neerabup			330				
Manjimup Biomass			45				
Proposed generators							
Collie Region				220			
Kwinana Region					80		
Collie Region						300	
Demand side response	131	118	79				
Total supply	4,062	4384	4725	4866	4946	5246	5246
Actual margin	262	298	492	505	441	613	500
Target margin	340	356	376	376	376	376	376
IMO 10%PoE, expected economic growth	3,800	4,086	4,233	4,361	4,505	4,633	4,746

Under Western Power's assumed generation development program:

- the Bluewaters generators are to be connected at 330 kV to the Bluewaters switchyard located in the Collie region;

- New Gen Kwinana is to be connected at 330 kV to the Kwinana switchyard;

- New Gen Neerabup is to be connected at 330 kV to the Neerabup switchyard; and

- the Manjimup Biomass generation is to be connected at 132 kV to the Manjimup substation.

It has been assumed that new generation installed after 2009/10 will be located in the Collie and Kwinana regions. Generation in the Collie region is assumed to be connected at 330 kV while generation in the Kwinana region is assumed to be connected at 132 kV. Western Power recognises that the actual generation projects that proceed could be significantly different to the assumptions set out above.

In addition to the projects identified above, Western Power has a significant number of enquiries and applications for large amounts of additional capacity dispersed widely across the SWIS. As noted earlier, this places additional resourcing pressure on Western Power.

3.4 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 defines the quantity of services that the transmission network must provide.

After allowing for the programmed retirement of existing generators in 2008/09 and 2009/10, there will be a requirement to develop around 1,700 MW of new generation capacity prior to summer 2012/13.

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. The uncertainty of transmission investment relating to the connection of new generation capacity has led Western Power to propose the continued application of an Investment Adjustment Mechanism. The rationale for, and design of the Investment Adjustment Mechanism is discussed in more detail in Part D of this submission.

4 Transmission capital expenditure

4.1 Introduction

This section provides an overview of 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, as far as practicable, comply with all relevant legislation and regulations;
- service performance should 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; and
- the life-cycle costs of providing transmission services should be minimised by optimising operating and capital expenditure where substitution is possible.

It is essential that expenditure plans can be delivered given the availability of internal and external resources, and the need to ensure that expenditure is executed efficiently. Furthermore, expenditure plans must balance the objectives of meeting customers' demands for better service, satisfying statutory compliance obligations and minimising the costs of providing services.

The purpose of this section is to provide an outline of Western Power's transmission capital expenditure plans for the forthcoming access arrangement period, taking account of recent cost and service performance, and the forecast cost pressures in the forthcoming access arrangement period. Western Power's expenditure plans also reflect a careful consideration of performance risk and deliverability, which ensures that a balanced assessment is made of what the business can and should achieve, given the expected resource constraints.

Western Power's transmission capital expenditure forecasts are fully described and substantiated in detail in the report prepared with the assistance of consultants PB titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

The remainder of this section is structured as follows:

- section 4.2 summarises the drivers of increased expenditure in the forthcoming access arrangement period;
- section 4.3 presents Western Power's transmission network capital expenditure proposals; and
- section 4.4 sets out Western Power's deliverability and risk assessment.

4.2 Drivers of increased transmission capital expenditure

In relation to transmission network capital expenditure, there are four principal drivers of increased expenditure compared to historic levels. These are:

- the unprecedented growth in electricity demand and the connection of additional generation capacity;
- the on-going impact of previously constrained expenditure;
- more onerous safety, health, and environmental regulations; and
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

To some extent these factors are equally relevant to Western Power's transmission operating expenditure and to Western Power's planned expenditure on its distribution network. For this reason, section 5 of this Part B (transmission operating expenditure) and sections 3 and 4 of Part C (distribution capital expenditure and operating expenditure) also refer to the discussion of these factors presented below.

4.2.1 Energy demand and new generation capacity

In sections 2 and 3 of this Part B, it was noted that increases in energy demand and forecast generation capacity will drive network expenditure.

As noted in section 2 of this Part B, the highest peak demand on the SWIS is recorded during summer. Furthermore, the increased penetration of air conditioning units means that maximum demand is more temperature sensitive than in previous periods, which places further demands on transmission system capacity. In fact, the primary driver of transmission capital expenditure in the forthcoming access arrangement period is the recent growth of the peak summer demand on the SWIS. In particular, Western Power has identified significant requirements for additional transmission capacity, including

- the development of new or upgraded transmission lines;
- the development of new or upgraded zone substations; and
- the acquisition of land for sites and easements.

Approximately 40% of Western Power's proposed transmission capital expenditure in the forthcoming access arrangement period is attributed to the following major projects to address demand growth:

- the new Pinjar-Geraldton 330 kV line, which is needed to provide infrastructure for connection of windfarms, coal fired base load generation and large industrial and mining loads;
- the new Kojonup-Albany 132 kV line, which is required to provide suitable transfer capacity for the forecast peak demand;
- the Grange Resources Mine 220 kV supply, which is required to accommodate a new bulk point load;

- the Shotts-East Terminal 330 kV line, required in order to maintain voltage stability due to increasing load in the metropolitan area supplied by new generation connecting to the south-west network;

- the new Gindalbe Metals-Eneabba-Three Springs 330 kV line; and

- the new Wanneroo-Hocking-Wangara 132 kV line.

Section 3 of this Part B, explained that Western Power's assumptions regarding new generation capacity are derived from the IMO's 2007 SOO. Whilst committed generation projects are reasonably certain in terms of their location and capacity, there is a substantial number of other potential generation projects that are much more uncertain.

Western Power recognises that without sufficient 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 adverse financial impacts on generators and retailers, with longer term consequences for the efficacy and the competitiveness of the wholesale and retail markets. This particular concern was noted in Western Power's submissions during the first access arrangement period, and remains valid for the forthcoming access arrangement period.

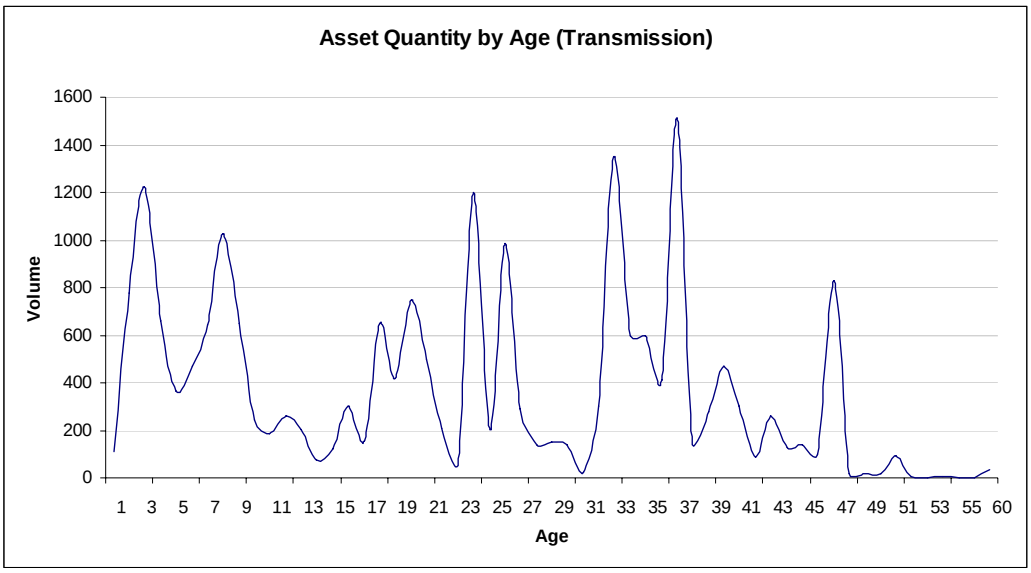
4.2.2 Impact of previously constrained expenditure

In its submissions for the first access arrangement period, Western Power commented that historically the company's expenditure had been constrained to the point where the business could barely undertake new customer works. The new regulatory framework provided by the Code (under the auspices of the Authority as the independent economic regulator) provided a necessary and welcome change to the expenditure and budgeting process. In particular, the Code imposes a discipline on Western Power and the Authority to take a longer term view of the network expenditure that is required to deliver appropriate outcomes for network users and end-use customers.

Unfortunately, during the first access arrangement period the number of customer connections and the required amount of network capacity augmentations have been higher than expected. As noted earlier, Western Power must give priority to work associated with connecting customers to the network and providing sufficient network capacity to meet their requirements. Given the need to operate within a resource constraint, Western Power re-prioritised its work program in the first access arrangement period, and this has resulted in a significant backlog of work in network replacement and maintenance. Whilst less-than-optimal expenditure in these areas can be sustained for some time, ultimately the age and condition of network assets must be managed within acceptable bounds.

In comparison to the first access arrangement period, the required increase in replacement capital expenditure that is necessary to arrest the growth in the replacement backlog is relatively modest. It should be noted that the extent of the increase required in replacement expenditure 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. Figure 28 below shows the transmission age profile of the network.

Figure 28: Transmission asset age profile



The advancing age of the network and existing condition of the assets indicates that within the next 10 to 15 years, Western Power will need to replace much greater volumes of assets than have been required to be replaced in the last ten years. Figure 28 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, the graph provides a general indication that Western Power is entering a period of increasing need for asset replacement and this correlates with the increased forecast expenditure levels.

Given the age profile of the asset base, the impact of budget-constrained expenditure can have serious consequences for the performance of the network, especially in the medium to long-term. For example, recent and current pole inspection information suggests that 750 to 800 per annum (approximately 2.5% of the population) of transmission wood poles installed between 40-60 years ago will require replacement over the next few years. If the replacement of these poles is deferred as a result of resource constraints, it can lead to a significant and growing backlog of replacement works that may be progressively more difficult to manage, with consequences for safety and reliability risks.

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

In the first access arrangement period, Western Power emphasised that 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 again identified the specific capital expenditure projects that are required in order to ensure the company's compliance with existing regulations relating to:

- noise mitigation;
- transmission line river crossings;

- transformer neutral earthing resistors and bunding;
- transmission substation safety upgrades; and
- step and touch potential mitigation.

The primary compliance issues that must be addressed in the forthcoming access arrangement period are set out in Table 23 below:

Table 23: Primary compliance issues- transmission capital expenditure

Pole replacement	Increased expenditure on pole replacements is necessary to replace structures that do not meet current Western Power standards and/or ENA C(b)1 requirements.
Upgraded substation security	Increased expenditure is required to upgrade substation security, particularly improving the fencing and the installation of active security monitoring at about 156 existing substations owned by Western Power. This on-going program is consistent with meeting the ENA's 'National Guidelines for Prevention of Unauthorised Access to Electricity Infrastructure' DOC 015 – 2006'.
Asbestos removal	Western Power has an ongoing program of work to remove all asbestos containing material from its substations. The expenditure allowance included in the 2009/10-2011/12 regulatory accounts for 60 of the 96 sites identified in the company's asbestos register.
Replacement of non complying stays and insulators	In co-ordination with Energy Safety, Western Power has undertaken a review of the wet withstand flashover capability of insulators on its timber pole stays. A program of works will commence in the forthcoming access arrangement period to address the large number of currently non-compliance insulators.
Substation safety upgrades	As part of an on-going program of improvement, Western Power has identified inadequate substation yard lighting, site surfacing, technical access and other safety issues that do not conform to Australian Standard (AS 2067) and Western Power standards. These matters will be addressed in the forthcoming access arrangement period.

While safety and environmental considerations are already well embedded in Western Power's systems and processes, maintaining compliance and addressing new requirements is an important, and ongoing, business need. A number of new requirements have been imposed upon Western Power by the Energy Safety Directorate particularly in relation to bush fire preparedness and safety, navigable waterways and substation security. There are also a number of safety and reliability issues that have arisen due to changes in (Australian and/or Industry) standards, and in response to specific incidents. Addressing these issues will also require some additional capital expenditure compared to recent historic levels.

4.2.4 Increasing input prices for materials and labour

It is widely acknowledged that the prices of materials and labour in network infrastructure companies have risen significantly faster than CPI in recent years. For example, the AER recently commented that high input costs such as construction materials and labour (as a consequence of the minerals boom) was one of the

reasons for the required increase in ElectraNet's average transmission prices[10]. In Western Power's case, economic growth in Western Australia has outstripped other states in Australia, exacerbating the increases in Western Power's input prices. The rapid economic growth in Western Australia has also placed a premium on third-party contractors, which has been reflected in recent competitive tender prices for various capital works.

Western Power believes that the substantial increase in input prices during the first access arrangement period will continue to place upward pressure on the costs of Western Power's capital expenditure programs. Unfortunately, it is not prudent to defer capital works in the hope that labour and material prices fall in real terms in the future (in the course of the economic cycle). In fact, deferral of expenditure will expose Western Power's customers to unacceptable service performance risk, which may eliminate any potential price benefit that would otherwise arise from expenditure deferral.

Western Power engaged the services of Access Economics to undertake a study of the material and labour cost escalation factors that have affected Western Power's costs in the recent past and to provide a forecast of their likely movement in the forthcoming access arrangement period. The Access Economics report titled, *Material and Labour Cost Escalation Factors,* is attached as Appendix 2.

Access Economics confirms that Western Power's costs have increased dramatically in the first access arrangement period. Access Economics summarises the task of forecasting the cost escalation factors in the following terms[11]:

> "In brief, Western Power has seen a rapid lift in unit costs in recent years, as the strength of the Western Australia economy in general and construction activity in the State in particular has combined with a shortage of labour in key trades to see unit costs of labour and materials rise well ahead of overall inflation in the last three years (whether measured by the more well-known CPI or the more indicative non-farm GDP deflator).
>
> The key questions in this project therefore revolve around whether the sharp re-rating in labour and materials costs in recent years is structural or cyclical and, to the extent it is cyclical, the timing of an eventual turn in that cycle."

Access Economics further explains that demand from China has led to unprecedented increases in raw material prices, with little scope for relief during the forthcoming access arrangement period[12]:

> "Worldwide prices for raw materials are being lifted by the striking lift in demand from China (which accounts for 30-40% of world demand in key components such as iron ore). Many industrial inputs have trebled in price on world markets since mid-2003. This demand pressure on raw materials prices has swamped the benefits from the rising $A, though the latter has provided a handy offset for the pricing of some types of raw materials. The outlook for raw materials is breaking into three parts:
>
> – Base metal prices may be nearing a peak, though their fall-off will be slow, and only partly unwind the gains of recent years.

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10 Australian Energy Regulator, ElectraNet Transmission Determination 2008–09 to 2012–13, Final Decision, 11 April 2008, page 110.

11 Access Economics, Material and Labour Cost Escalation Factors, April 2008, page iv.

12 Ibid.

– Energy-related prices (including aluminium) may retain relatively more of their gains in recent years, in part due to an expectation that carbon taxes/trading will affect prices to end consumers in coming years.

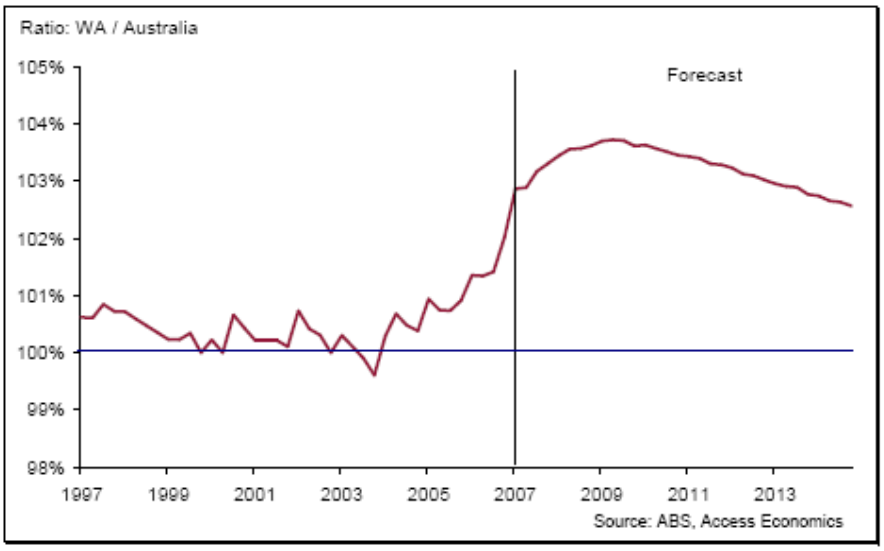
– Bulk commodity (coal and iron ore) prices are still rising sharply, and that will low through to downstream product prices through the course of 2008-09."

Whilst Access Economics explains that the substantial increases in raw material prices have been offset to some extent by the strength of the Australian dollar and the lower costs of manufactured goods (also as a result of the boom in China), these moderating effects cannot be assumed to continue in the forthcoming access arrangement period. Furthermore, Access Economics makes the following observations regarding labour costs[13]:

> "Labour costs have leapt in response to the local construction and engineering sector boom – key trades are seeing shortfalls in available labour, driving labour 'prices' ever higher as a result. Some of that pressure is beginning to ease in the eastern States, but there is no evidence of an easing yet in the West. While these rises are partially offset by rising productivity, they should remain strong, perhaps notably so in 2008-09."

Figure 29 and Table 24 below (reproduced from Access Economics' report) shows how labour costs in Western Australia have increased relative to the Australian-wide labour price index (LPI).

Figure 29: Western Australian Labour Price Index as a ratio to the Australian LPI



Access Economics has produced a detailed assessment of the forecast escalation factors for the labour and material costs that will drive Western Power's unit costs for its transmission and distribution expenditure plans. Details of Access Economics' approach and findings are provided in its report at Appendix 2. For ease of reference, a summary table reproduced from this report is presented below.

[13] Ibid.

Table 24: Forecast cost escalators less underlying CPI

Cost Escalation Factors	2006/7	2007/8	2008/9	2009/10	2010/11	2011/1
Labour Escalation (%)						
External - WA utilities workers	5.12%	5.84%	4.92%	4.54%	4.12%	4.78%
Internal*	6.10%	5.00%	6.50%	6.00%	6.00%	5.50%
Land Escalation (%)						
Perth	8.70%	8.16%	7.66%	5.32%	5.20%	7.61%
Remainder of WA	8.15%	7.36%	6.90%	4.60%	4.56%	7.02%
Material Cost Escalation (%)						
Concrete	2.62%	3.01%	4.35%	1.11%	2.11%	8.44%
Fabricated steel	1.47%	8.00%	12.17%	3.59%	1.48%	6.80%
Wooden poles	3.41%	2.58%	5.97%	3.43%	2.30%	6.55%
Electrical cable	40.74%	-1.01%	8.92%	4.60%	2.00%	6.82%
Raw copper	40.53%	0.39%	-5.97%	-9.94%	-8.17%	-6.92%
Raw aluminium	23.57%	-6.18%	-0.34%	-0.17%	-2.93%	-2.73%
Electrical and control equip.	5.30%	5.59%	10.80%	3.13%	1.14%	6.01%
Lights	3.12%	5.07%	8.51%	2.28%	0.35%	5.07%
Nuts, bolts, screws	5.29%	0.22%	5.62%	0.53%	-1.67%	3.16%
Earthworks	5.92%	4.75%	4.76%	2.74%	2.75%	6.14%
Sheet metal	0.69%	4.33%	10.67%	1.83%	0.49%	5.57%
Combined Material Escalators (%)						
Transmission operating	17.33%	2.29%	9.35%	3.60%	1.43%	6.23%
Transmission capital	13.33%	3.66%	10.16%	3.49%	1.36%	6.20%
Distribution operating	6.80%	3.87%	9.13%	2.98%	1.04%	5.83%
Distribution capital	19.96%	1.95%	9.40%	3.74%	1.48%	6.32%
Weighted Average % (Nominal)						
Transmission Operating	7.82%	4.84%	6.38%	4.93%	4.34%	5.34%
Distribution operating	6.00%	4.95%	6.78%	4.83%	4.23%	5.38%
Transmission capital	10.35%	4.37%	8.39%	4.09%	2.67%	5.76%
Distribution capital	11.31%	4.07%	7.12%	4.60%	3.55%	5.58%
Inflation (CPI)	2.07%	4.51%	2.98%	2.47%	2.59%	2.70%

Before applying these escalation rates to Western Power's capital expenditure forecasts, a number of other matters need to be considered. In particular, it is important to take account of the risk inherent in any capital project. Put simply, history shows that in almost all industries, there is a greater probability that a project will exceed its budget than come in under budget. This is particularly true of the kind of projects undertaken by Western Power, where long lead times require that costs are estimated several years prior to commissioning. To take account of this capital budgeting risk, Western Power engaged Evans & Peck, a consulting firm that has worked with other network service providers on this issue. On the basis of its detailed analysis of Western Power's capital expenditure projects, Evans & Peck recommended that Western Power include a risk allowance of 3.5%. The report from Evans & Peck titled, *Quantitative Risk Assessment of Capex and Opex Expenditures*, is provided as Appendix 3 to this document.

To provide further confidence that the resulting capital expenditure projections are reasonable, Western Power also engaged SKM to conduct an independent benchmarking study. The purpose of the SKM study was to obtain independent verification that the estimated values used for transmission capital works is in line with national averages. This independent benchmarking exercise examined the final costs produced for the most common types of capital construction activities, including the design, construction and commissioning of a selection of zone and terminal substations and transmission lines of different voltages. The results of the SKM

report titled, *Transmission Asset Cost Benchmarking* (Appendix 4 to this document), confirm that Western Power's forecasts are consistent with national averages.

4.3 Western Power's capital expenditure proposals

Western Power is proposing to invest $2.03b during the next three year regulatory period in its transmission asset base. Figure 30 and Table 25 below list Western Power's historical and projected transmission capital expenditures.

Figure 30 shows that Western Power proposes to increase transmission capital expenditure from an average of $347m per annum between the 2006/07-2008/09 period to an average of $677m per annum over the 2009/10-2011/12 regulatory period. This represents an increase of approximately 95%, which is primarily associated with required increases in capacity expansion.

Figure 30: Transmission capital expenditure ($ million real as at 30 June 2009)

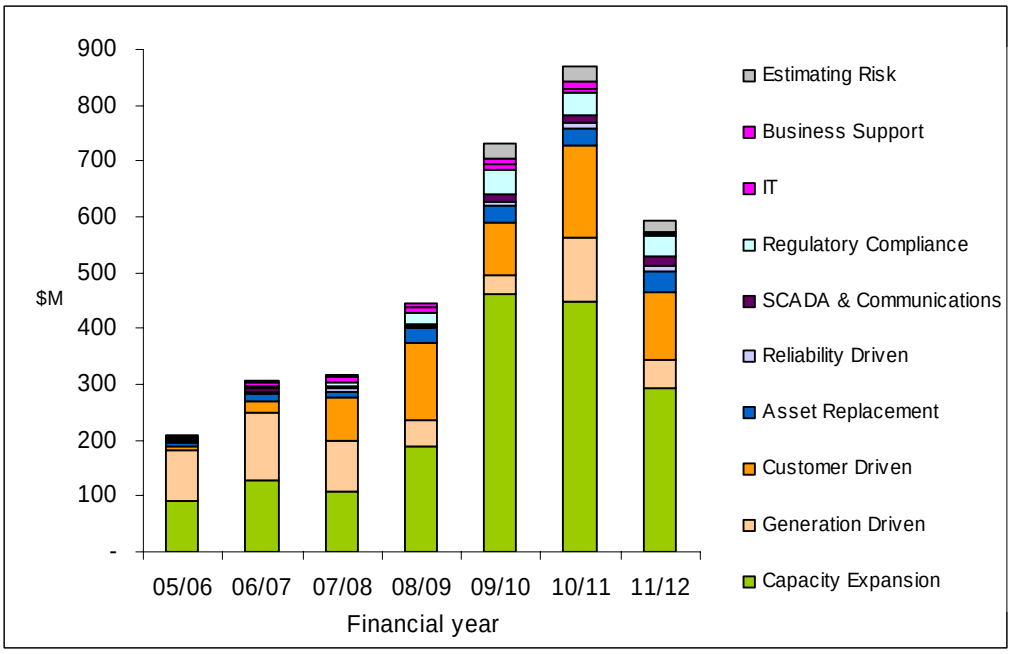


Table 25: Transmission capital expenditure ($ million real as at 30 June 2009)

Expenditure category	05/06	06/07	07/08	08/09	09/10	10/11	11/12
GROWTH							
Capacity expansion	89.97	127.43	109.16	188.26	460.26	449.16	292.98
Generation driven	90.52	121.29	90.73	47.80	36.43	112.49	49.52
Customer driven	8.70	19.26	75.59	139.53	92.56	165.18	121.42
Estimating Risk (3.5%)	0	0	0	0	20.62	25.44	16.24
ASSET REPLACEMENT & RENEWAL							
Asset replacement	7.70	13.88	11.74	26.79	30.58	30.95	38.61
Estimating Risk (3.5%)	0	0	0	0	1.07	1.08	1.35
IMPROVEMENT IN SERVICE							
Reliability driven	1.21	5.17	5.25	2.01	6.14	9.64	9.25
SCADA & communications	4.55	5.92	3.91	4.74	13.04	13.39	15.83
Estimating Risk (3.5%)	0	0	0	0	0.67	0.81	0.88
COMPLIANCE							
Regulatory compliance	3.77	4.20	5.87	18.97	45.86	41.45	37.11
Estimating Risk (3.5%)	0	0	0	0	1.61	1.45	1.30
CORPORATE							
IT	0.85	6.45	11.66	8.52	9.10	7.30	4.45
Business support	3.12	3.26	3.09	7.01	12.05	11.53	4.86
Total ($M)	**210.39**	**306.86**	**316.98**	**443.63**	**729.98**	**869.86**	**593.79**

Further details of the forecast of capital expenditures are provided in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

4.4 Expenditure deliverability and risk assessment

Section 5 of Part A explained Western Power's plans for delivering increased capital expenditure over the forthcoming access arrangement period in light of resource constraints. Western Power has assessed the constrained transmission capital expenditure to be approximately 90% of the unconstrained business needs. As noted in Section 5 of Part A, to ensure that the constrained expenditure can be delivered, Western Power has developed a long-term Strategic Delivery Framework.

Under that framework, Western Power has identified the most appropriate service delivery arrangements utilising a combination of the following approaches to deliver the planned transmission capital works:

- Resourcing the transmission capital expenditure plan with a combination of internal Western Power resources, Alliance Partners and Western Power's preferred vendors.

- Western Power's Alliance Partners will play an important role in ramping up to the required resourcing level. It is planned that approximately $1 billion of capital works will be undertaken by Alliance Partners in the forthcoming access arrangement period, primarily in relation to new transmission lines and line upgrades, and new transmission substations and substation upgrades.

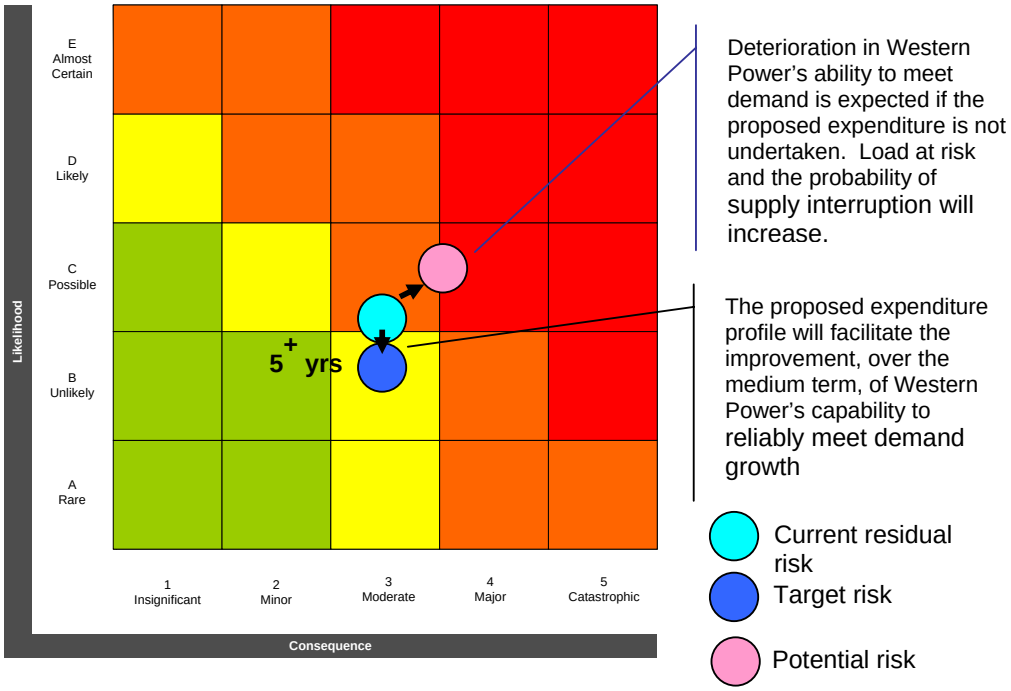
- New agreements with Alliance Partners have recently been negotiated. These agreements provide greater certainty of work for contractors and hence allow contractors to commit to a resourcing strategy that meets Western Power's needs. Importantly, the agreements provide for the efficient and timely delivery of the proposed capital works through shared incentive arrangements, key performance indicators and governance arrangements that provide collective responsibility for project delivery.

- Resource constraints can also be eased by using developers to deliver customer-funded transmission works, including transmission lines and steel pole replacements. This strategy has proved to be successful in relation to distribution works in the first access arrangement period, and therefore is being extended to transmission capital expenditure in the forthcoming access arrangement period.

These resourcing strategies provide Western Power with confidence that its constrained transmission capital expenditure plans can be achieved. In addition to carefully considering the deliverability of its proposed transmission capital expenditure program, Western Power has also undertaken an analysis of the risks that would arise if transmission capital expenditure were reduced from the levels proposed for the forthcoming access arrangement period.

In particular, Western Power's expenditure plans for transmission capacity expansion have been reduced from the level that would be economically justifiable in a world where resources are not constrained. As a result of applying this constraint, Western Power has analysed the risks that would arise if this category of expenditure were reduced further. This is depicted diagrammatically in Figure 31 below.

Figure 31: Risk analysis matrix – Failure to Plan for Electricity Demand



It is evident from the above diagram that Western Power's ability to meet demand would be unreasonably compromised if the proposed expenditure is not undertaken.

Western Power has also assessed the risks associated with reductions in its proposed transmission capital expenditure programs in terms of public safety. It has been found that reductions in the level of proposed transmission capital expenditure would result in an unacceptable increase in risk exposure in this critical area.

4.5 Concluding comments

In the first access arrangement period, Western Power delivered a transmission capital works program involving substantially increased levels of expenditure, compared to previous years. Western Power proposes further substantial increases in transmission capital expenditure in the forthcoming access arrangement period. The key drivers of the proposed increases are:

- the unprecedented growth in electricity demand and the connection of additional generation capacity;
- the on-going impact of previously constrained expenditure;
- more onerous safety, health, and environmental regulations; and
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

Western Power has undertaken a careful assessment of the capability of the company to deliver the proposed works program, taking into account the limited availability of suitable resources to undertake the work. The company has developed a detailed resourcing plan to ensure that it is capable of delivering the planned increases in expenditure. Whilst Western Power recognises that delivery of the planned expenditure program will be a challenge, the company is confident that it has the plans and arrangements in place to deliver the proposed works.

Western Power has also undertaken an assessment of the risks associated with reducing transmission capital expenditure to levels below those proposed, and it has found that such reductions would result in unacceptable increases in risk exposure in relation to meeting the demand for electricity and public safety.

The information presented in this document and the supporting appendices:

- provides detailed substantiation of Western Power's proposed transmission capital expenditure for the forthcoming access arrangement period, in accordance with the requirements of the Code and the Authority's *Guidelines for Access Arrangement Information;* and
- demonstrates that Western Power's forecast transmission capital expenditure can be reasonably expected to satisfy the requirements of the new facilities investment test, and can therefore be included in Western Power's forward looking efficient cost of providing reference services for the forthcoming access arrangement period in accordance with section 6.51 of the Code.

5 Transmission operating and maintenance expenditure

5.1 Introduction

This section provides an overview of Western Power's operating and maintenance expenditure forecasts for the transmission network. In broad terms, Western Power's operating expenditure plans are intended to 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, as far as practicable, compliance with health, safety and environmental obligations;
- minimization of total life-cycle costs by optimising operating and maintenance, and capital expenditures; and
- delivery of achievable and sustainable efficiency gains, in terms of improved performance, increased output and lower cost.

Western Power's transmission operating and maintenance expenditure forecasts are fully described and substantiated in detail in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

The remainder of this section is structured as follows:

- section 5.2 summarises the drivers of increased operating expenditure in the forthcoming access arrangement period;
- section 5.3 presents Western Power's transmission network operating expenditure proposals;
- section 5.4 presents an overview of Western Power's assessment of the deliverability of the proposed operating expenditure program, as well as a risk assessment of the proposed program; and
- section 5.5 presents concluding comments.

5.2 Drivers of operating expenditure

In a number of respects, the drivers of increased operating expenditure are similar to those identified in relation to capital expenditure (in section 4 above). In particular, future transmission operating expenditure is principally affected by:

- the impact of network growth and new connections for load and generation;
- the on-going impact of previously constrained expenditure; and

- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

These three factors are examined in more detail below. A summary of the key drivers of the transmission operating expenditure forecast is then provided.

5.2.1 Impact of a growing transmission network

Chapter 4 of this Part B explained the principal factors that are contributing to a significant increase in transmission capital expenditure during the forthcoming access arrangement period. It was noted, for example, that the sustained period of high economic growth in Western Australia and an increasing penetration of air conditioning load contributed to the required increase.

A corollary of a growing asset base is an increase in the quantity of transmission assets requiring inspection and operation during the forthcoming access arrangement period. The increased forecast operating expenditure relates primarily to the cost of employing more technicians to manage and maintain the additional assets. The growth in operating expenditures is moderated by asset condition monitoring improvements and asset replacement with advanced functionality. Transmission SCADA and communications costs will also increase as the size of the network grows.

The report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document explains that the growth in transmission assets accounts for a significant percentage of the forecast increase in operating expenditure and is calculated by applying Western Power's transmission operating expenditure model. It should also be noted that the operating expenditure model reduces the forecast maintenance expenditure where expenditure plans provide for the refurbishment or replacement of transmission assets. Further details regarding the operating expenditure model is presented in Appendix 1 to this document.

5.2.2 Impact of previous budget constraints

In its submissions for the first access arrangement period, Western Power explained that it needed to address a growing backlog in preventative routine maintenance in order to arrest the recent increase in asset failure rates. Western Power further explained that the backlog in preventative routine maintenance had arisen from budget constraints that had limited the company's expenditure to well below optimal levels. Unfortunately, for the reasons explained in Chapter 4 of this Part B, Western Power has been unable to address the backlog issues in preventative maintenance, principally because of the need to prioritise work programs to address the immediate needs of new generation and load connections.

Preventative maintenance includes preventative routine maintenance and preventative condition maintenance.

- Preventative Routine Maintenance is proactive maintenance carried out to reduce the probability of failure, or degradation in performance of transmission network assets. The activities undertaken include monitoring, testing and inspection of equipment that is either initiated by equipment operations or condition or is undertaken at predetermined intervals. This work typically includes visual inspection, testing, lubrication regimes and routine minor part replacement.

- Preventative Condition Maintenance costs relate to follow-up maintenance activities that are performed as a result of conditions or defects identified through preventative routine maintenance programs.

Operating expenditure for both categories of preventative maintenance is forecast to increase in the forthcoming access arrangement period.

In addition to preventative maintenance, Western Power has also identified a number of other areas where further work is required to bring the company's performance up to industry best practice. A summary of the key areas where additional expenditure is required as a result of prior budget constraints is identified in Table 26 below.

Table 26: Remedial actions to address the impact of previous budget constraints

Substation transformer re-clamping	This project involves the inspection of transformers susceptible to winding displacement and failure when subjected to through fault current.
Overhead line maintenance	Overhead line maintenance relates to the correction of conditions identified from inspections, and includes maintenance carried out from ground level, via helicopter platform or using live line techniques. The condition assessments have identified defect rates that are significantly higher than previously estimated.
Addressing the defect backlog	Western Power has a backlog of transmission conditions outstanding from the first access arrangement period. This backlog was quantified by searching the Elipse database to identify and collate all outstanding preventative condition maintenance and deferred emergency conditions currently logged as open.
Substation HV equipment testing	Forecast substation HV equipment testing expenditures for the next regulatory period reflects 100% of tests specified in the relevant asset management policy and current costs. Western Power will use resources released by the abolition of equipment warranty testing and program tests for periods of low system demand when existing constraints will be substantially reduced as a result of the proposed capital works program.

5.2.3 Increases in unit costs

As noted in section 4.2.4 of this Part B, Western Power has commissioned Access Economics (see appendix 2 of this document) to provide a forecast of real increases in wages for WA Utility Workers and combined materials for distribution and transmission operating and capital works. The cost estimates for transmission operating expenditure forecasts include real internal labour, contract services and material cost escalation, but do not include any contingencies. The cost escalation is applied in an operating expenditure model which includes composite cost escalators for each major operating expenditure category based on the proportion of internal labour, contract services and materials in each category.

Cost and asset escalation has been included in the transmission operating forecasts at a cost category level rather than on a global level to facilitate comparison of forecasts with current regulatory period actual and forecast expenditures. For further details of the escalation rates assumed for the forthcoming access arrangement period, please refer to section 4.2.4 of this Part B.

5.2.4 Summary of main drivers of transmission operating expenditure forecasts

An overview of the main drivers of Western Power's proposed transmission operating expenditure for the next access arrangement period is provided in Table 27 below.

Table 27: Main drivers of transmission operating expenditure requirements

Increased asset population	The forecast transmission capital works program will result in a considerable increase in the quantity of assets requiring inspection and operation during the forthcoming access arrangement period. As noted in section 5.2.1, the forecast operational expenditures include allowances to manage the additional assets that Western Power is planning to commission over that period.
Cost uplift	As already noted, Western Power has engaged an independent expert (Access Economics) to provide advice on the likely real increases in external labour and material costs expected over the next regulatory period. These real cost increases have a significant impact on the magnitude of the forecast expenditures.
Substation primary and secondary plant maintenance	Due to a combination of budgetary and resource constraints, only 60% of the preventative routine maintenance activity detailed in the relevant maintenance policies are currently being carried out by Western Power. This level of maintenance is sub-optimal and unsustainably low; it will result in degradation of service levels if it is permitted to continue. The transmission operating expenditure forecasts for the next access arrangement period provide for Western Power's full compliance with the maintenance recommended in the relevant policies. As a result, forecast expenditure is expected to be approximately 25% higher than that expected in the 2008/09 financial year. This is due to a combination of both increasing work volumes to prudent levels and cost uplift.
Substation HV equipment testing	Due to resource restraints and an inability to gain access to the equipment due to system loading constraints, Western Power's current expenditure reflects approximately 50% of the number of tests required by the relevant asset maintenance policy. This level of testing is sub-optimal and unsustainably low, and it will result in degradation of equipment condition (with consequential potential impacts on network performance) if it is permitted to continue. Forecast substation HV equipment testing expenditures for the next access arrangement period provide for full compliance with the testing regimes specified in the relevant asset management policy.
Warranty inspection and testing	Expenditure for this preventative maintenance category is forecast to reduce over the next regulatory period as Western Power intends to focus its efforts on pre-commissioning testing which has proven to be more effective and reduces the need for system outages. This focus will result in a substantial reduction in equipment testing prior to the end of the warranty period. It will also increase the availability of resources for other transmission works. However, there will be a corresponding increase in commissioning costs associated with Western Power's proposed transmission capital works program.

Silicon application to insulators	Sylgard protection applied to transmission insulators reduces pole top fires and also reduces television interference. This approach has been a very effective strategy that has been employed by Western Power for a number of years. Western Power proposes the continuation of this program in the next access arrangement period, with the volume of insulators to be treated remaining constant over the period. An increase in forecast expenditure is anticipated due to the uplift in unit costs (noted above).
Overhead lines maintenance	Overhead line inspections include both inspection and rectification of conditions found. Recent condition assessments have identified defect rates that are significantly higher than previously estimated. Expenditure for this preventative maintenance category is therefore forecast to increase over the forthcoming access arrangement period.

5.3 Western Power's transmission operating expenditure forecasts

Western Power's total transmission operating expenditure forecast by category for the next access arrangement period is shown in Figure 32 and Table 28 below.

The forecast operating expenditure is approximately 42% higher (in real terms) than the company's actual expenditure for the first period.

Figure 32: Transmission operating expenditure ($ million real as at 30 June 2009)

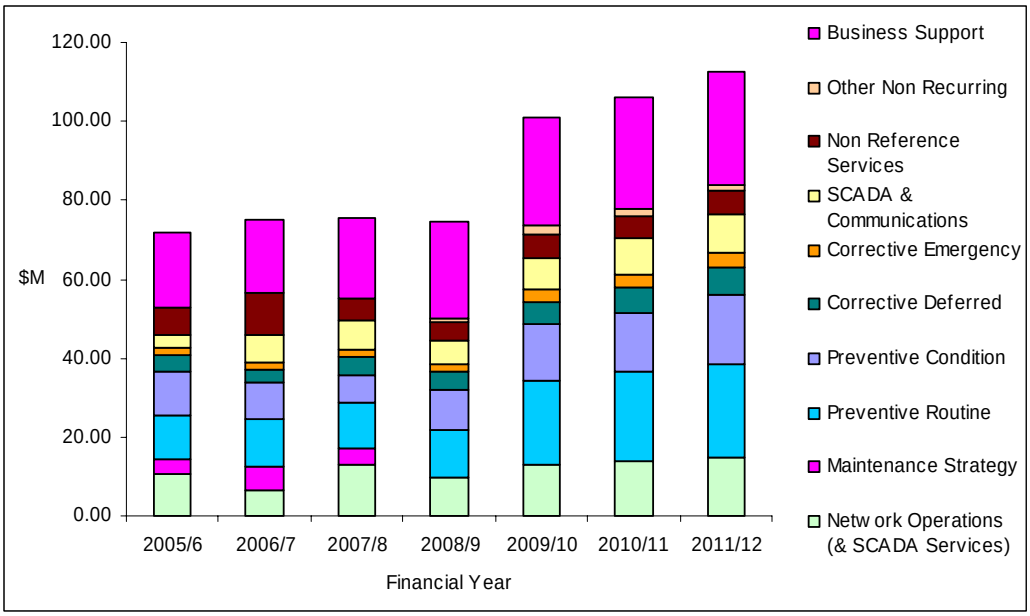


Table 28: Transmission operating expenditure ($ million real as at 30 June 2009)

Item	05/06	06/07	07/08	08/09	09/10	10/11	11/12
Maintenance strategy[14]	3.99	6.03	4.33	0	0	0	0
Preventive routine	11.06	11.84	11.74	12.09	21.42	22.65	23.91
Preventive condition	11.02	9.36	6.80	10.43	14.17	14.94	17.26
Corrective deferred	4.39	3.44	4.84	4.45	5.73	6.53	7.21
Corrective emergency	1.55	1.72	1.85	1.86	2.98	3.27	3.42
SCADA & communications	3.52	7.00	7.17	6.00	8.12	8.94	9.92
Non reference services	7.00	10.77	5.46	4.45	5.99	5.67	5.94
Network operations[15]	10.44	6.52	12.77	9.64	12.92	14.00	14.70
Other (non recurring)	0	0	0	1.30	2.18	1.94	1.70
Business support	18.93	18.54	20.63	24.30	27.39	28.04	28.70
Total (M)	**71.9**	**75.22**	**75.59**	**74.52**	**100.9**	**105.98**	**112.76**

Further details of the forecast operating expenditures are set out in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

5.4 Expenditure deliverability and risk assessment

5.4.1 Capability to deliver the proposed works

Section 5 of Part A explained Western Power's plans for delivering increased expenditure over the forthcoming access arrangement period in light of resource constraints. As noted in that section, to ensure the delivery of the planned increases in both operating and capital expenditure, Western Power has developed a long-term Strategic Delivery Framework. The focus of the framework is to establish a balanced 'portfolio' of service delivery mechanisms to maximise Western Power's flexibility to respond to changing needs and demands, whilst also reducing the cost of delivery.

Under the framework, Western Power proposes to deliver the planned transmission operating and maintenance expenditures through the following arrangements:

- Use of internal resources will be the primary means of delivering the required operating and maintenance programs.
- Discrete parcels of work will be undertaken by contractors under AS 4000 contracts and preferred vendor arrangements. The activities to be undertaken by external service providers include:
    - transmission line inspections;
    - transmission line vegetation management;
    - transmission line siliconing;

[14] Maintenance strategy activities are treated as a component of the direct overhead cost from 08/09 onward

[15] Includes SCADA Services costs that support NOCC and SOCC mainframe SCADA systems etc.

- transmission line aerial helicopter maintenance; and
- transmission substations grounds clearing and vegetation maintenance.

Approximately 20% of the planned transmission operations expenditure will be delivered by external resources.

5.4.2 Risks arising if proposed works are not undertaken

In addition to considering the deliverability of its proposed transmission operating expenditure program, Western Power has also undertaken an analysis of the risks that would arise if transmission operating expenditure were to be reduced from the levels proposed for the forthcoming access arrangement period.

Over the next access arrangement period, Western Power proposes to undertake 97% of the unconstrained operating expenditure program. This program has been assessed by Western Power (with the assistance of consultants PB) as being the minimum operations and maintenance works required to enable Western Power to maintain an acceptable level of compliance with applicable regulatory obligations, having regard to the risks associated with potential or technical non-compliance.

As noted in section 4.3 of Part A, Western Power recognises that 100% compliance with all industry standards and obligations remains a stretch target for the company as it plans for the forthcoming access arrangement period. Whilst statutory obligations are non-discretionary, Western Power must accept the practical reality that against some obligations the company's performance will continue to be less than adequate. This difficult situation has arisen over an extended period as budget constraints, growing demands and tougher industry standards and obligations have combined to create a compliance gap. Western Power's proposed operating expenditure program for the next access arrangement period will assist in bridging this compliance gap. Where gaps remain, however, the company has strategies in place to efficiently manage the resulting risk exposures.

Western Power's risk analysis indicates that reductions in transmission operating expenditure to levels below those proposed for the forthcoming access arrangement period would lead to:

- unacceptable increases in the risk of deterioration in the reliability performance of the transmission network over the medium term (that is, after the end of the forthcoming access arrangement period);
- increases in the risk of unacceptable delays in new customer connections during the next access arrangement period; and
- unacceptable increases in public safety risks during the forthcoming access arrangement period and beyond.

5.5 Concluding comments

The total forecast transmission operating expenditure for the next access arrangement period represents a real increase of approximately 42% over the total actual and forecast expenditures of the current period. The proposed increases in operating expenditure for the next access arrangement period are driven primarily by:

- the impact of network growth and new connections for load and generation;

- the on-going impact of previously constrained expenditure, and Western Power's planned increase in preventative maintenance in particular, to address the backlog of work; and

- the continuing increases in unit costs, particularly in light of the resources boom in Western Australia.

In relation to the final point listed above, Western Power is taking all possible steps to mitigate input price increases, however these price rises are substantially beyond the company's control.

Western Power has undertaken a careful assessment of the capability of the company to deliver the proposed operating expenditure program, taking into account the limited availability of suitable resources to undertake the work. The company has developed a detailed resourcing plan to ensure that it is capable of delivering the planned increases in expenditure. Whilst Western Power recognises that delivery of the planned expenditure program will be a challenge, the company is confident that it has the plans and arrangements in place to deliver the proposed works.

Western Power has also undertaken an assessment of the risks associated with reducing transmission operating expenditure to levels below those proposed, and it has found that such reductions would result in unacceptable increases in risk in relation to network reliability over the medium term, public safety and new customer connection rates.

The information presented in this document and the supporting appendices provides detailed substantiation of Western Power's proposed transmission operating expenditure for the forthcoming access arrangement period, in accordance with the requirements of the Code and the Authority's *Guidelines for Access Arrangement Information.*

6 Asset valuation and depreciation

6.1 Introduction

The calculation of Western Power's target revenue for 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 forthcoming access arrangement period can be divided into two categories:

- assets employed at the access arrangement start date, which is scheduled to be 1 July 2009; and

- assets which are added to the capital base throughout the duration of the forthcoming access arrangement period, which is scheduled to be from 1 July 2009 to 30 June 2012.

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 depends on the company's capital expenditure program[17], and regulatory depreciation[18].

The remainder of 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 the valuation of the transmission capital base as at 30 June 2009 (the proposed access arrangement start date) in light of the Code provisions and the applicable provisions contained in Western Power's approved access arrangement for the period from 1 July 2006 to 30 June 2009;

- section 6.4 summarises Western Power's approach to depreciation of the transmission capital base; and

- section 6.5 provides details of the calculations of the transmission capital base value from 1 July 2009, for each subsequent year of the forthcoming access arrangement period.

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 document.

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.

6.2 Code provisions relating to the valuation of the capital base

Section 6.43 of the Code states that:

> "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."

Provisions governing the valuation of the capital base for the start of the forthcoming access arrangement period and subsequent access arrangement periods are set out in section 6.48 of the Code, as follows:

> "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*.
>
> {Note: A number of options are available in relation to the determination of the *capital base* at the start of an *access arrangement period*, including:
>
> - rolling forward the *capital base* from the previous *access arrangement period* applying benchmark indexation such as the consumer price index or an asset specific index, plus *new facilities investment* incurred during the previous *access arrangement period*, less depreciation and *redundant capital* etc; and
> - valuation or revaluation of the *capital base* using an appropriate methodology such as the Depreciated Optimised Replacement Cost or Optimised Deprival Value methodology.}"

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 6.52 of the Code provides that new facilities investment can be added to the capital base if the New Facilities Investment Test is satisfied:

"6.52 *New facilities investment* may be added to the *capital base* if:

(a) the *new facilities investment* does not exceed the amount that would be invested by a *service provider efficiently minimising costs*, having regard, without limitation, to:

(i) whether the *new facility* exhibits economies of scale or scope and the increments in which capacity can be added; and

(ii) whether the lowest sustainable cost of providing the *covered services* forecast to be sold over a reasonable period may require the installation of a *new facility* with capacity sufficient to meet the forecast sales;

and

(b) one or more of the following conditions is satisfied:

(i) either:

A. the *anticipated incremental revenue* for the *new facility* is expected to at least recover the *new facilities investment*; or

B. 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*."

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 The valuation of the transmission capital base as at 30 June 2009

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 second and subsequent access arrangement periods must be determined in a manner which is consistent with the Code objective (and may include "rolling forward" the capital base from the previous access arrangement period by applying an index such as the consumer price index, plus new facilities investment incurred during the previous access arrangement period, less depreciation and redundant capital);
- New facilities investment that satisfies the New Facilities Investment Test may be added to the capital base;
- 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 for which capital contributions have been paid by customers; and
- 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.

In accordance with these requirements Western Power has determined the capital base at 30 June 2009 by:

- "rolling forward" the capital base value at the commencement of the previous access arrangement period (30 June 2006) as set out in section 6.1 of Western Power's approved access arrangement for the period 1 July 2006 to 30 June 2009;
- applying the consumer price index to the rolled-forward capital base value;
- adding all new facilities investment incurred during the first access arrangement period; and
- deducting depreciation.

In accordance with the requirements of section 6.52 of the Code, new facilities investment undertaken during the first access arrangement period has been added to the capital base. To demonstrate that Western Power's capital expenditure satisfies the new facilities investment test (NFIT), Western Power commissioned consultants PB to undertake a review. The report from PB titled, *Assessment of AA1 Capex – NFIT Submission*, concludes that Western Power's capital expenditure does satisfy the NFIT and is provided as Appendix 5 to this document.

Table 29 below sets out the approved transmission capital base value as at 30 June 2006, expressed in real dollars as at 30 June 2009.

Table 29: Approved transmission capital base value as at 30 June 2006 ($ million real as at 30 June 2009)

Asset Group	Value
Transmission cables	13.3
Transmission steel towers	401.2
Transmission wood poles	189.8
Transmission Metering	2.3
Transmission transformers	170.2
Transmission reactors	4.3
Transmission capacitors	83.8
Transmission circuit breakers	500.1
SCADA and Communications	37.2
IT&T	2.9
Other Non-Network Assets	26.9
Land & Easements	91.2
TOTAL	**1,523.2**

Table 30 below lists the new facilities investment undertaken during the first access arrangement period which will be added to the capital base.

Table 30: New facilities investment to be added to the transmission capital base ($ million real as at 30 June 2009)

Asset Group	Year of expenditure		
	2006/07	2007/08	2008/09
Transmission cables	5.6	4.8	8.2
Transmission steel towers	88.0	124.5	135.1
Transmission wood poles	15.4	14.6	22.2
Transmission Metering	0.0	0.0	0.0
Transmission transformers	59.0	52.3	83.6
Transmission reactors	4.4	3.3	5.2
Transmission capacitors	28.7	22.0	34.4
Transmission circuit breakers	60.9	50.6	91.8
SCADA and Communications	7.5	5.2	6.8
IT&T	6.4	11.7	8.5
Other Non-Network Assets	3.3	3.1	7.0
Land & Easements	27.6	24.9	40.7
TOTAL	**306.9**	**317.0**	**443.6**

Details of the calculation of the transmission capital base value as at 30 June 2009 are set out in Table 31 below.

Table 31: Derivation of Transmission Capital Base at 30 June 2009 ($ million real as at 30 June 2009)

Financial year ending:	30 June 2006	30 June 2007	30 June 2008	30 June 2009
Opening capital base value		1,523.2	1,776.5	2,035.2
less Depreciation		-53.6	-58.3	-63.3
plus New Facilities Investment		306.9	317.0	443.6
less Redundant Assets		0.0	0.0	0.0
Closing capital base value	**1,523.2**	**1,776.5**	**2,035.2**	**2,415.5**

It is noted that the capital base valuation reflects a forecast of capital expenditure and inflation for the year ending 30 June 2009. At the time of preparing these proposed access arrangement revisions, actual capital expenditure data for the whole of the 2008/09 year are not available, whilst inflation for the year ending 30 June 2009 is forecast to be 3.0%. Western Power therefore proposes that at the next access arrangement review:

- the capital base value at the commencement of the next access arrangement period will be adjusted (in real terms) for any difference between the forecast and actual capital expenditure for the year ending 30 June 2009, and for any difference between actual inflation (measured by the increase in the eight cities weighted average CPI) and the forecast of 3.0%; and

- an adjustment to the target revenue in the next access arrangement period will be made to compensate Western Power (or users) for the revenue foregone (or additional revenue recovered) over the forthcoming access arrangement period in respect of the 2008/09 financial year capital expenditure forecast error and inflation forecast error.

It is noted that under these arrangements:

- the target revenue for the forthcoming access arrangement period will not be adjusted for any differences between actual capital expenditure and the forecast of capital expenditure for the 2008/09 year, or for any difference between forecast and actual inflation, used to establish the opening capital base value at 1 July 2009; however

- adjustments made at the next access arrangement review will have the effect of ensuring that the present value of the total revenue recovered by Western Power over the forthcoming access arrangement period and subsequent access arrangement periods will be equivalent to the amount that would be recovered if actual capital expenditure and inflation for 2008/09 had been forecast with 100% accuracy; and

- Western Power and users are therefore held economically neutral in the event that there are any differences between the actual capital expenditure and the forecast of capital expenditure for the 2008/09 year, or any difference between forecast and actual inflation for that year, used to establish the opening capital base value at 1 July 2009.

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[19], depreciation (as defined in 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.

In accordance with the requirements set out in Code (noted above), Table 32 below set out the transmission asset categories and economic lives for regulatory depreciation purposes.

[19] "Calculation of Service Provider's Costs".

Table 32: Transmission asset groupings and economic lives for depreciation purposes

Asset group	Economic Life (years) for depreciation purposes
Transmission transformers	50 years
Transmission reactors	50 years
Transmission capacitors	40 years
Transmission circuit breakers	50 years
Transmission lines - steel towers	60 years
Transmission lines - wood poles	45 years
Transmission cables	55 years
Transmission metering	40 years
Transmission SCADA and Communications	34.15 years
Transmission IT&T	16.85 years
Transmission Other, non-network assets	16.85 years

Western Power adopts a straight-line approach to depreciation and is not proposing any accelerated depreciation in the forthcoming access arrangement period in relation to transmission assets.

6.5 Proposed transmission capital base and depreciation values

As noted in section 6.3 above, Western Power has adopted a transmission capital base of $2,415.5 million as at 30 June 2009, which reflects the latest capital expenditure and approved depreciation.

Table 33 below provides details of the composition of the transmission capital base as at 30 June 2009, by asset group.

Table 33: Transmission Initial Capital Base as at 30 June 2009 ($ million real as at 30 June 2009)

Asset Group	Value
Transmission cables	30.5
Transmission steel towers	715.4
Transmission wood poles	214.4
Transmission Metering	2.1
Transmission transformers	342.7
Transmission reactors	16.8
Transmission capacitors	157.3
Transmission circuit breakers	647.7
SCADA and Communications	46.6
IT&T	27.0
Other Non-Network Assets	30.7
Land & Easements	184.3
TOTAL	2,415.5

Table 34 below shows the transmission depreciation by asset class.

Table 34: Transmission depreciation by asset class ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012
Transmission cables	0.7	1.1	1.4
Transmission steel towers	15.5	17.9	21.2
Transmission wood poles	10.3	11.5	12.8
Transmission Metering	0.1	0.1	0.1
Transmission transformers	10.6	13.2	16.3
Transmission reactors	0.4	0.5	0.6
Transmission capacitors	5.8	6.6	7.8
Transmission circuit breakers	21.8	25.0	28.3
SCADA and Communications	3.8	4.3	4.9
IT&T	2.3	2.3	2.6
Other Non-Network Assets	2.9	3.6	4.3
Land & Easements	0.0	0.0	0.0
TOTAL	74.3	86.1	100.4

Table 35 below provides an overview of the forecast transmission capital base values for each year of the forthcoming access arrangement period.

Table 35: Assessment of transmission asset values ($ million real as at 30 June 2009)

Financial year ending:	30 June 2009	30 June 2010	30 June 2011	30 June 2012
Opening capital base value		2,415.5	3,021.2	3,720.5
less Depreciation		-74.3	-86.1	-100.4
plus Forecast Capital Expenditure		680.0	785.5	530.3
less Redundant Assets		0.0	0.0	0.0
Closing capital base value	2,415.5	3,021.2	3,720.5	4,150.5

The forecast capital expenditure shown in Table 35 is net of forecast transmission capital contributions in the same years, as shown below:

Table 36: Forecast Transmission Capital Contributions by expenditure type ($ million real as at 30 June 2009)

	Second access arrangement period		
	2009/10	2010/11	2011/12
Customer Driven	50.0	84.4	63.5
Transmission Total ($M)	**50.0**	**84.4**	**63.5**

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 access arrangement information describes the methods and assumptions applied by Western Power to estimate its WACC for the purpose of calculating the target revenue for its transmission and distribution networks. In particular, the information presented in this section is intended to assist interested parties in understanding Western Power's derivation of the WACC.

This section is therefore 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. It also examines recent regulatory developments in Australia that are relevant to the Authority's consideration of Western Power's proposed WACC;
- section 7.6 quantifies the plausible range for the regulatory WACC;
- section 7.7 outlines the approach applied, and considerations taken into account by Western Power to select a point estimate of the WACC from the plausible range. It sets out Western Power's conclusion on the WACC to be applied for the purpose of calculating the company's target revenue for the forthcoming access arrangement period.

7.2 Code and other regulatory provisions relating to WACC

Section 6.64(a)(ii) 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 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 6.65 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.[20] The determination has effect in relation to Western Power's proposed access arrangement revisions for the period commencing on 1 July 2009.

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;
> - 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."

[20] 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

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."

It is noteworthy that on 23 June 2008 the Authority published a final determination on the WACC for the West Australian freight and urban railway networks[21]. The Authority's WACC determination for the railway networks adopts an approach to determining the real risk free rate that differs from the approach set out in the Authority's WACC methodology determination for covered electricity networks. The approach adopted by the Authority in its more recent rail WACC determination is consistent with that now adopted by other Australian regulators including the Australian Energy Regulator and the Essential Services Commission, Victoria. Accordingly, and pursuant to section 6.64 of the Code, Western Power has adopted the approach to determining the real risk free rate as set out in the Authority's June 2008 WACC determination for the railway networks, on that basis that it would better achieve the objectives set out in section 6.4 and the Code objective.

7.3 Western Power's approach to estimating the WACC

Western Power appointed KPMG to provide specialist assistance in estimating the WACC. The report provided by KPMG forms part of this access arrangement information, and is attached as Appendix 6.

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.

The methodologies applied by KPMG in its report are consistent with the Authority's WACC methodology determination for covered electricity networks (of 25 February 2005), with the exception of the approach adopted to estimate the real risk free rate. In that particular case, KPMG has adopted the approach applied most recently by the Authority in its June 2008 WACC determination for the railway networks. As noted above, the adoption of that approach is permitted by, and consistent with, section 6.64 of the Code.

[21] Economic Regulation Authority, *Final Determination: 2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks*, 23 June 2008.

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

As already noted, there is significant uncertainty and estimation error involved in determining a point estimate of the WACC. This uncertainty requires careful 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 significant in clarifying the nature and scope of the Authority's discretion in exercising its decision making powers. Section 4.28 provides that the Authority must determine whether a proposed access arrangement meets the Code objective and the requirements set out in chapter 5 of the Code. 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) Pty 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.

Western Power notes that paragraph 27 of the Authority's 2005 WACC determination states 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 on this issue is not strictly consistent with the requirements of section 4.28 of the Code and the findings of the Australian Competition Tribunal described above. Western Power wishes to draw the Authority's attention to this apparent anomaly.

7.5 Estimating WACC in a regulatory context: guidance from recent regulatory developments

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."[22]

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

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[23].

- 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:[24]

> "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…
>
> 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…"

---

[23] 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".

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

Following the conclusion of the Productivity Commission's review, the Ministerial Council on Energy (MCE) commenced a further program of regulatory reform aimed at establishing a national framework for energy network access covering both the gas and electricity sectors. One of the stated purposes of these further reforms is to "enhance regulatory certainty"[25].

To advise on a model to achieve a common approach to network pricing across the national energy market, the MCE established the Expert Panel on Energy Access Pricing in December 2005. The Expert Panel delivered its final report in April 2006, in which it reiterated the need for regulatory certainty as follows[26]:

> "A regulatory environment that is conducive to desirable investments being made in a timely way is important. This means not only appropriate returns in the short term but that potential investors can be confident that sound substantial long term investment decisions can be based on a well understood and predictable regulatory regime and not rendered loss-making by subsequent regulatory intervention.
>
> Equally important is the predictability of those decisions – that is the development of an approach that gives energy users and investors in transmission and distribution infrastructure confidence that access and pricing outcomes will be guided by known principles that are applied in a consistent manner."

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;
- 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; and
- regulatory decision-making in relation to the WACC should be both consistent and predictable through time, recognising in particular the very long lives of regulated infrastructure assets.

In this context, it is particularly noteworthy that Chapter 6A of the National Electricity Rules (NER) now specifies the values to be used for certain parameters in the determination of the regulatory WACC for electricity transmission network service providers. In its November 2006 final determination on the rules governing the regulation of transmission revenue in the NEM (Chapter 6A), the Australian Energy Market Commission discussed the rationale for fixing the values of certain WACC parameters, and stated:

> "The provision of stability in the short term regarding the determination of the WACC reduces an important source of potential variability in regulatory decision making

[25] Ministerial Council on Energy, *Report to the Council of Australian Governments: Reform of Energy Markets*, 11 December 2003, page 4.

[26] Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, page 59.

providing a more certain and predictable environment for investment and financing decision-making."[27]

The initial WACC parameter values specified in the NER are subject to periodic review by the Australian Energy Regulator (AER) in accordance with guiding principles set out in the NER. Those principles provide that, among other things, where a specified parameter value cannot be determined with certainty, the AER must have regard to the need for persuasive evidence before adopting a value that has previously been adopted for it[28].

Western Power is of the view that considerable weight should be attached by the Authority to the WACC parameter values presently specified in Chapter 6A of the NER.

7.6 Quantification of the plausible range for WACC

Based on its analysis, KPMG's report concluded that the WACC for Western Power's networks 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 37 below.

Based on the ranges estimated for the WACC parameter values, KPMG has concluded that a reasonable estimate of Western Power's WACC lies in the range of 8.5% to 11.1% real pre-tax (given the interest rates prevailing over the 60 trading day period to 23 June 2008).

[27] AEMC, National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006, Rule Determination, 16 November 2006, pages 57-61.

[28] Sections 6A.6.2(j)(4) and 6.5.4(4) of the National Electricity Rules.

Table 37: Pre-tax real WACC parameter estimates

Parameter	Basis of estimate	Plausible range	
		Low	High
Nominal risk free rate *	This is the effective annual nominal yield on 10 year Government bonds interpolated from yields on bonds maturing in February 2017 and February 2019, averaged over a 60 trading day period to 23 June 2008.	6.45%	
Inflation forecast *	This is a 10 year forecast estimated from short-term inflation forecasts published by the Reserve Bank of Australia (RBA) and the long term inflation target of the RBA. The approach is consistent with that applied recently by other Australian regulators.	2.73%	
Real risk free rate	The inflation forecast is used to de-escalate the nominal risk free rate to estimate the real risk free rate. This approach departs from the Authority's 2005 WACC determination for electricity networks but is consistent with the Authority's most recent (June 2008) WACC determination for railways. Its application for the purpose of estimating Western Power's WACC accords with provisions set out in section 6.64 of the Code.	3.62%	
Equity beta	The range reflects KPMG's view that a reasonable range for the equity beta would have to include a value of 1.0, preferably as a central estimate. Comprehensive analysis suggests that there are strong reasons not to depart from an equity beta of 1.0.	0.9	1.1
Market risk premium (MRP)	The range is based on empirical data on long-term historical averages of the MRP in Australia. It takes into account recent academic research showing that MRP estimates based on pre-1958 data may be unreliable. The lower bound value of the range (6%) is the value most commonly used by regulators and by independent experts in valuations of companies subject to takeovers.	6%	7%
Capital structure (equity to total value)	This estimate is consistent with regulatory decisions around Australia. Prevailing market evidence does not provide a compelling case to justify a departure from this benchmark.	60%	
Debt margin *	The range reflects the yields on 10 year BBB and BBB+ rated corporate bonds, based on data sourced from CBA Spectrum. The estimates represent average yields over a 60 trading day period to 23 June 2008. The estimates include an allowance of 12.5 basis points per annum for debt establishment costs.	336.6 basis points	365.8 basis points
Value of imputation credits (gamma)	The range is consistent with regulatory decisions and empirical evidence, which suggests that a value of 50% is likely to overstate the appropriate value for gamma; and a value for gamma of zero is consistent with the market evidence and would appear to be consistent with a value for the MRP of 6%.	Zero	0.5
Real pre-tax WACC	Plausible combinations of upper and lower bound estimates of the WACC parameters	**8.5%**	**11.1%**

** NOTE: Estimates of the nominal risk free rate, expected inflation and the debt margin will be subject to change to reflect prevailing interest rates and the corresponding 10-year inflation outlook over a sampling period to be agreed (on a confidential basis) between the Authority and Western Power*

7.7 Conclusion: Western Power's proposed WACC

KPMG's detailed analysis demonstrates that a reasonable estimate of Western Power's WACC lies in the range of 8.5% to 11.1% real pre-tax (given the interest rates prevailing over the 60 trading day period to 23 June 2008).

Western Power proposes to apply a real pre-tax WACC of 8.95% for the purpose of determining its target revenue for the forthcoming access arrangement period. As noted in section 7.6 above, this value will be subject to revision to reflect the prevailing interest rates and the corresponding 10-year inflation outlook over a sampling period to be agreed (on a confidential basis) between the Authority and Western Power.

It is noted that the proposed WACC point value of 8.95% real pre-tax lies towards the lower end of the reasonable range estimated by KPMG. This point estimate reflects Western Power's application of the real risk free rate and debt margin estimated by KPMG, together with the parameter values specified in Chapter 6A of the National Electricity Rules in relation to: equity beta (1.0); gamma (0.5); market risk premium (6%); and gearing (60%). Western Power has selected this point estimate in order to:

- moderate - within the constraints determined by the need to maintain business viability - the price increases that are required for the forthcoming access arrangement period, and to

- propose a WACC value that is demonstrably within a reasonable range, and which will therefore be accepted by the Authority.

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

- the company has submitted a WACC proposal which is consistent with the National Electricity Rules and towards the lower end of KPMG's range;

- the company shares the Authority's desire - as expressed in its submission to the Infrastructure Task Force[29] - to ensure that the approval process is not unduly delayed by time-consuming debate over the proper value for the WACC.

As discussed in sections 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 of the Code.

As demonstrated in the foregoing discussion and in Appendix 6:

- Western Power's proposal seeks to moderate, as much as is practicable, the upward pressure on prices in the immediate term.

- Whilst it is toward the lower bound of the reasonable range estimated by KPMG, the proposed point estimate of the WACC is consistent with maintaining the financial viability of Western Power.

[29] 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

- Western Power's proposal is consistent with principles espoused by the MCE's Expert Panel, and codified in the National Electricity Rules, regarding the need for regulatory decision-making on the WACC to be both consistent and predictable through time.

- Western Power's proposal is based on a thorough and robust analysis of the individual parameter values that must be combined to form a point estimate of the WACC that satisfies the requirements of the Code, including the Code objective in section 2.1 and the price control objective in section 6.4.

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*."

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 revenue requirements relating to the efficient forward-looking costs of a regulated company is often referred to as the "building block" approach, and has been applied by Western Power in this proposed revision to its access arrangement.

The purpose of this section of the access arrangement information is to explain how the cost elements discussed in the earlier sections of this Part B are combined, along with other elements (namely, those listed in section 6.4 of the Code and in sections 5.32 and 5.37 of Western Power's approved access arrangement), to determine the target revenue in each year of the forthcoming access arrangement period. A similar calculation is explained in section 7, Part C of this document 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 efficient forward-looking costs of providing transmission reference services; and

- section 8.3 provides details of the composition of the target revenue, including figures showing the trend of transmission revenue and average prices to the end of the forthcoming access arrangement period.

8.2 Overview of "Building Block" Revenue Determination Method

The revenue requirements relating to the forward-looking efficient costs of providing reference services are calculated as the sum of a series of "building blocks" which are described briefly in Table 38 , below. As already noted, the earlier sections of this Part of the document provide detailed analysis of each building block element.

Table 38: Summary of the building block components of the forward-looking efficient costs of providing reference services

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

The forward-looking efficient cost of providing reference services is calculated using a model which adopts an end of year timing assumption for modelling revenues and expenses[30] in real terms. That model calculates the forward-looking efficient cost of providing reference services for each year of the access arrangement period in accordance with the following formula:

$$FC_t = r.RAB_{t,open} + Dep_t + O\&M_t$$

where

FC_t = forward-looking efficient cost of providing reference services in year t.

r = WACC (in real pre-tax terms).

$RAB_{t,open}$ = opening value of the regulatory asset base (which takes into account forecast new facilities investment over the access arrangement period).

Dep_t = depreciation in year t (which takes into account forecast new facilities investment over the access arrangement period).

$O\&M_t$ = forecast of operating and maintenance costs for year t.

[30] The calculations assume that all forecast capital expenditure occurs at the end of each relevant year. The effect of this assumption is to align the timing of forecast capital expenditure with that of all other costs and revenues, which are assumed to occur at the end of each relevant year.

A copy of the revenue model outputs is provided in Appendix 7.

8.3 Forecast target revenue for the transmission network

Western Power's forecast target revenue for the forthcoming access arrangement period is calculated in accordance with section 6.4 of the Code, which provides that the price control in an access arrangement must have the objectives of, amongst other things, giving Western Power an opportunity to earn revenue ("target revenue") for the access arrangement period from the provision of covered services.

Section 6.4 defines "target revenue" as 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, plus:

- any amount to reward Western Power for efficiency gains and innovation beyond the efficiency and innovation benchmarks in a previous access arrangement period (determined in accordance with any gain sharing mechanism in place); plus

- an amount (if any) relating to the recovery of costs of unforeseen events in a previous access arrangement period, determined under section 6.6; plus

- an amount (if any) relating to the recovery of costs of technical rule changes in a previous access arrangement period, determined under section 6.9; plus

- an amount (if any) determined under an investment adjustment mechanism in accordance with sections 6.13 to 6.18; plus

- an amount (if any) determined under a service standards adjustment mechanism in accordance with see sections 6.29 to 6.32; plus

- an amount (if any) relating to a requirement for Western Power to pay a tariff equalisation contribution to the Tariff Equalisation Fund in accordance with section 6.37A of the Code.

In addition, Western Power's approved access arrangement for the period from 1 July 2006 to 30 June 2009 provides for the following matters to be taken into account in the determination of target revenue for the forthcoming access arrangement period:

- Section 5.32 of Western Power's approved access arrangement provides for an adjustment, termed the capital contributions adjustment mechanism to be made to the target revenue for the second and, if appropriate, subsequent access arrangement periods to reflect any difference between the deemed capital contributions in respect of the transmission network and the actual capital contributions received during the first access arrangement period.

- Section 5.37 of the approved access arrangement provides for the correction factor, TK_t, to apply in the first year of the forthcoming access arrangement period to adjust for any difference between maximum regulated transmission network revenue and actual transmission network revenue, in relation to the financial year commencing on 1 July 2008.

Table 39 below shows the composition of transmission network revenue for the forthcoming access arrangement period. Further details of the modelling is set out in Appendix 7.

Table 39: Composition of transmission network revenue ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012	Present Value
Operating Costs	100.9	106.0	112.8	269.1
plus Depreciation	74.3	86.1	100.4	218.3
plus Redundant Assets	0.0	0.0	0.0	0.0
plus Return on Assets	216.2	270.4	333.0	683.7
plus Return on Working Capital	0.2	0.3	2.6	2.5
Forward-looking efficient costs	**391.6**	**462.8**	**548.7**	**1,173.6**
less Non-Reference Services Revenue	-6.2	-6.0	-6.3	-15.7
Transmission Reference Service Revenue	**385.3**	**456.8**	**542.4**	**1,157.9**
Deferred Transmission Reference Service Revenue				**14.6**
Smoothed Reference Services Revenue - TR_t	**338.0**	**446.8**	**590.6**	**1,143.3**
Unforeseen events revenue adjustment	0.0			0.0
plus technical rule change revenue adjustment	0.0			0.0
plus investment adjustment mechanism amount	16.4 (Forecast)			15.0
plus capital contribution adjustment mechanism amount	-45.0 (Forecast)			-41.3
Adjustments in accordance with previous access arrangement	**-28.6 (Forecast)**			**-26.3 (Forecast)**
Smoothed adjustments in accordance with previous access arrangement – $AA\#1_t$	**-7.8 (Forecast)**	**-10.3 (Forecast)**	**-13.6 (Forecast)**	**-26.3 (Forecast)**
Tariff Equalisation Contribution – TEC_t	**0.0**	**0.0**	**0.0**	**0.0**
Correction factor from 2008/09 – TK_t	**0.0 (Forecast)**			
Maximum transmission reference service revenue – MTR_t	**330.2 (Forecast)**	**436.5 (Forecast)**	**577.1 (Forecast)**	**1,117.0 (Forecast)**

Following advice from economic consultants, NERA, Western Power proposes to revert to the conventional regulatory treatment of capital contributions in the forthcoming access arrangement period. In the first access arrangement period, Western Power adopted the so-called Queensland Method, which had the effect of artificially depressing price increases in the first access arrangement period. NERA's

recommendations will have the effect of creating a one-off increase in Western Power's revenue requirements in the forthcoming access arrangement period.

To effect a transition to the conventional approach to capital contributions and also to manage the price increase in the forthcoming access arrangement period as a result of Western Power's increased expenditure needs, Western Power has deferred the recovery of $14.6 million ($ real as at 30 June 2009) for the transmission network to the third or subsequent access arrangement periods. In determining the price increases over the forthcoming access arrangement period and the consequential revenue deferral amount, Western Power has had regard to optimising the anticipated price increases at the commencement of, and during, the third access arrangement period.

The deferred amount of revenue is expressed in present value terms as at 30 June 2009. An amount must be added to the *target revenue* for the transmission network in the third *access arrangement period* or subsequent *access arrangement periods* such that the present value (at 30 June 2009) of the total amount added to *target revenue* (taking account of inflation and the time value of money) is equal the present value of the deferred amount (at 30 June 2009). For the avoidance of doubt, the addition to *target revenue* in the third and subsequent *access arrangement periods* must leave Western Power financially neutral compared to a situation where revenue deferral had not occurred. The deferral of revenue in this way is an extraordinary step which aims to further manage the price impacts on customers in the forthcoming access arrangement period.

Figure 33 and Figure 34 below show the trend in transmission tariff revenues and average transmission tariff prices in real dollars to the end of the forthcoming access arrangement period.

Figure 33: **Trend in Transmission Tariff Revenue in real dollars as at 30 June 2009**

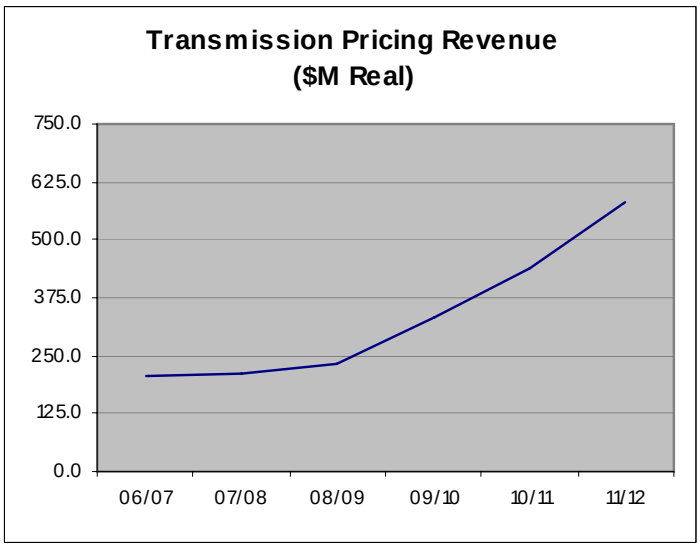
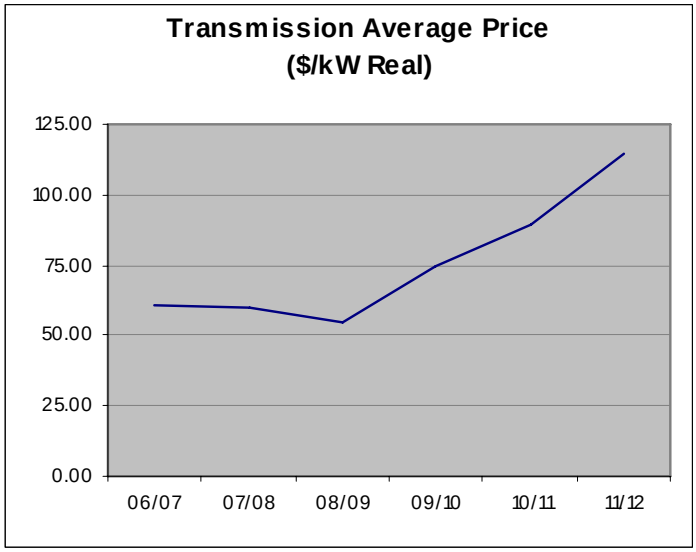


Figure 34: Trend in Transmission Average Price in real dollars as at 30 June 2009



PART C: DISTRIBUTION BUSINESS EXPENDITURE PLANS AND TOTAL REVENUE

1 Introduction to Part C

This Part C 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 sections 4 and 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 valuation of the capital base and depreciation;
- 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

As noted above, the quantity of distribution services to be delivered over the forthcoming access arrangement period is a key driver of distribution investment and operating expenditure requirements over the period. In this regard, section 2 of Part B of this document explained that:

- Western Power uses the IMO's 2007 SOO as the basis of its demand forecasts for network planning purposes;

- For distribution network planning purposes, individual substation (non-coincident) peak demand forecasts are used to develop zone substation augmentation needs; and

- Distribution capital expenditure projections for capacity expansion projects are based on a 50% PoE demand forecast and the application of this forecast at the high voltage distribution feeder level.

Given that Western Power's approach to demand forecasting is explained in section 2 of Part B, this section is focused on providing an overview of the distribution system energy forecasts for the access arrangement period. In relation to the distribution network, energy forecasts are used to set tariffs.

Accordingly, the remainder of this section is structured as follows:

- section 2.2 provides an overview of Western Power's methodology for distribution energy forecasting; and

- section 2.3 presents the distribution system energy forecasts.

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 = Synergy Retail sales

+ Third Party Retail sales

- Direct transmission sales

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, in order to forecast sales in the forthcoming access arrangement period. In essence, the forecasts of distribution energy for forthcoming access arrangement period were developed by growing the total distribution energy with the same underlying annual energy growth rate forecast by the IMO in its 2007 SOO, i.e. 2.2%.

2.3 Western Power's distribution system energy forecasts

Western Power's distribution energy sales forecast are summarised in Table 40 below. These forecasts have been developed using the forecast methodology described in section 2.2 above.

Table 40: Forecast Distribution Energy Sales (GWh)

Year	Forecast Sales (GWh)
2007/08 (Actual)	13,087
2008/09	13,375
2009/10	13,670
2010/11	13,970
2011/12	14,278

The information presented above demonstrates that the distribution energy forecasts are robust and fit for purpose.

3 Distribution capital expenditure

3.1 Introduction

This section provides an overview of Western Power's capital expenditure forecasts for the distribution network. In broad terms, Western Power's capital expenditure plans are intended to achieve the following outcomes:

- network asset condition and service performance should, as far as practicable, 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 can be achieved 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 document), 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 constraints. In particular section 5 of Part A explained the strategies and initiatives adopted by Western Power

to improve the business' capacity to deliver an increased quantity of projects in the face of resource constraints, and without compromising cost efficiencies. These strategies and initiatives have been deployed across the whole of Western Power's business, and are therefore equally relevant to this section.

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 of increased distribution capital expenditure in the forthcoming access arrangement period;
- section 3.3 presents Western Power's distribution network capital expenditure proposals.
- section 3.4 presents an overview of Western Power's assessment of the deliverability of the proposed capital expenditure program, as well as a risk assessment of the proposed program; and
- section 3.5 presents concluding comments.

3.2 Drivers of increased distribution capital expenditure

Section 4.2 of Part B explained that in relation to transmission capital expenditure, there are four principal drivers of increased investment from historic levels. These are:

- the unprecedented growth in electricity demand and the connection of additional generation capacity;
- the on-going impact of previously constrained expenditure;
- more onerous safety, health, and environmental regulations; and
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

To some extent each of these four factors is equally relevant to Western Power's distribution network. Each of these factors is discussed in detail in section 4.2 of Part B and, therefore, is not repeated in this section. It is also noted that section 4.2 of Part B also refers to supporting reports from consultants Access Economics, Evans & Peck and SKM, which are included as Appendices 2, 3 and 4 to this document. The remainder of this section explains Western Power's approach to the following distribution-specific matters in the forthcoming access arrangement period:

- Replacement of aging network assets;
- Feeder load reduction strategy;
- Reliability performance improvement; and
- Compliance related initiatives.

3.2.1 Replacement of aging network assets

In a number of asset classes, the age of individual assets significantly exceeds their expected lives, and these assets are now overdue for replacement. Specific strategies target those asset classes where action is required to arrest further degradation of the asset class population; achieve safety standards and move towards mandated reliability targets.

The strategies for replacement of the distribution network reflect a 'long term' view, with actual replacements based on asset specific condition assessments. However, some assets are nominated to run to failure as it is not efficient to instigate a maintenance, condition assessment and asset replacement programme for such assets (for instance, cable joints).

The long term view underpinning the asset replacement program takes into account the nominal, expected and extended lives of an asset, based on life cycle data (including data regarding serviceability, operations, enhancements and local conditions). In this context, it is important to note that the forecast asset replacement capital expenditure has been developed using a bottom up-approach. Each major category of asset has been considered, and Western Power's asset management expertise has been applied to asset condition information, failure rates, and other asset information to develop the forecast capital expenditure for the forthcoming regulatory period.

Western Power's forecast of asset replacement expenditure for the forthcoming access arrangement period includes allowances for expenditure in the following asset categories:

- distribution poles;
- distribution conductor;
- distribution transformers;
- substations;
- surge arrestors;
- drop-out fuses
- high voltage switches / disconnectors;
- rebuilding / reinforcement of Tambellup area feeders;
- auto-reclosers;
- low voltage switches / disconnectors;
- sectionalisers;
- compensators;
- vegetation related re-conductoring works; and
- wildlife proofing works.

3.2.2 Feeder load reduction strategy

In the metropolitan urban areas, load growth over the access arrangement period will increase feeder loadings and if unchecked, this will result in loadings on distribution substations and their supplying HV feeders that exceed optimum levels. The establishment of new zone substations, and the transfer of large amounts of existing network load to these substations, will partly address these issues by allowing new distribution feeders to be created that can supply the increased number and capacity of distribution substations. In addition to this, new feeders and feeder upgrades from existing substations are also required to provide for load growth in specific areas.

Western Power's planning criteria for urban areas requires (in part) that feeder peak loads are kept below 80% of their Normal Cyclic Rating (NCR). This criterion ensures that in the event of a network fault, network operators can restore supply by transferring the faulted feeder onto adjacent feeders.

Approximately 20% of metropolitan urban HV distribution feeders currently have loadings (measured by the utilisation of the feeder) that exceed Western Power's planning criteria. In the case of country HV distribution feeders, voltage constraints also add to existing capacity constraints. In the North Country and South Country respectively, 33 of the 109 feeders and 31 of the 78 feeders have voltage constraints. This situation complicates network switching arrangements. In some instances, feeder switching in the event of a fault is not possible due to feeder over-utilisation. This increases network operating costs and it also limits supply restoration capability, causing increases in fault outage durations experienced by customers. Western Power is therefore taking action to reduce the over-utilisation of distribution feeders to more manageable levels over the forthcoming access arrangement period.

Western Power has been unable to reinforce over-utilised feeders because resources have been allocated to higher priority customer works during the first access arrangement period. Consequently, specific strategies have been developed for the forthcoming access arrangement period to help reduce distribution feeder over-utilisation. These strategies involve undertaking additional investment that will increase feeder and zone substation capacity, and enable load transfers. These strategies will result in utilisation moving towards compliance with the established planning standards over the course of the forthcoming access arrangement period.

3.2.3 Reliability performance improvement

The *Electricity Industry (Network Quality and Reliability of Supply) Code 2005* sets supply reliability standards that Western Power must use all reasonable endeavours to meet. As noted in section 5 of Part A, Western Power's distribution network does not currently meet the required reliability standards.

Some reliability improvement works have been undertaken by Western Power in the first access arrangement period. However, a higher than forecast level of customer works has prevented Western Power from fully implementing its reliability improvement works program, with some resources being allocated to higher priority customer works.

Therefore, for the forthcoming access arrangement period, the company is proposing to undertake distribution capital (and operating) expenditure programs that will facilitate the delivery of a reduction in SAIDI of 29 minutes. This target reduction, whilst modest, nonetheless represents an achievable and realistic improvement of over 10% in the reliability performance of the network, whilst also taking account of

the on-going resource constraints. Consequently, the projected SAIDI at the end of 2008/9 of 230 minutes (a level which is consistent with actual average performance over the period from 2003/04 to the present) is forecast to reduce by 29 minutes to 201 minutes by the end of 2011/12.

Table 41 below provides an overview of the reliability improvement works that Western Power is proposing to undertake in the forthcoming access arrangement period.

Table 41: Summary of distribution network performance improvement works

Worst section targeted reliability reinforcement	The worst section targeted reliability reinforcement strategy focuses on feeders that contribute the most customers interrupted minutes (CIM) to the SWIS network, as well as the replacement of substandard equipment that pose a safety risk. This strategy involves reinforcement of the first section of HV overhead distribution feeders across the SWIS, which focuses on identifying and rectifying sub-standard constructions and/or defective components in the feeder backbone. This work includes, but is not limited to, replacement or reinforcement of poles, cross arm and insulator replacement, conductor replacement/upgrading, surge arrester installation and animal proofing.
Reliability reconductoring for load break switches installation	The strategy involves reconductoring at open points where load break switches will be installed. This will provide an improved load transfer capacity under network fault conditions and subsequently enable implementation of automated switching devices.
Distribution automation deployment	The objective of this strategy is to reduce the number of customers affected by supply interruptions, and significantly improve supply restoration time through the use of remote controlled automation devices. These devices will enable remote isolation of faulted sections of the network, and restoration of supply to the un-faulted sections.
Automated Circuit Breaker Ring Main Units (RMU) deployment	This strategy involves the replacement of existing underground switchgear with Circuit-Breaker RMUs in strategic locations to improve the supply reliability of underground and hybrid networks. Circuit-Breaker RMUs are capable of remote control, monitoring, isolation, and sequence switching, which will allow Western Power to minimise the number of customers affected by a fault, as well as reducing restoration times.
Other minor reliability strategies	Western Power has a number of minor strategies that are being implemented to improve the supply reliability performance of the distribution network and move Western Power toward compliance with the reliability performance targets. Examples of planned works include: ▪ South country feeder section refurbishment ▪ Pole top switch installation ▪ Wildlife proofing on the distribution network ▪ Overhead and underground fault-indicator deployment ▪ Lightning mitigation

North Country feeder section refurbishment	Feeder trips contribute 40% of SWIS SAIDI minutes, and much of this is related to the poor condition of aging infrastructure which, in some cases, is at least 40 years old and beyond its economic life. Most faults on the targeted feeders are caused by pole top equipment failure, corroded or clashing conductors, pole base failures, or lightning. The North Country feeder section refurbishment strategy targets the first section of poor performing HV distribution feeders, and other under-rated feeder sections, for rebuilding to address these issues.
North Country pole reinforcement	This strategy specifically targets reinforcement of strategic poles whose failure would have a significant negative impact on the reliability of the network. Poles selected for reinforcement are on fifteen North Country feeders, with several of these feeders exhibiting above average SAIDI performance.

3.2.4 Compliance-related initiatives

As noted in section 4.3 of Part A of this document, Western Power is required to comply with a number of safety, environmental and statutory requirements, particularly in regard to public safety, occupational health and safety, environmental management, and power quality (PQ) codes.

Compliance with the requirements of the following statutes drives much of the distribution capital expenditure under the regulatory compliance category:

- the Electricity Act 1945;
- the Electricity Industry (Network Quality and Reliability of Supply) Code 2005;
- the Electricity (Supply Standards & System Safety) Regulation 2001; and
- the Guidelines for the Design, Construction and Maintenance of Overhead Lines 2006 (HB C(b)1).

The principal examples of compliance-related capital expenditure are described briefly in Table 42 below.

Table 42: Principal compliance capital expenditure items- Distribution network

Replacement of overhead customer service connections	This strategy involves the replacement of all overhead PVC customer service connections and supporting equipment in accordance with current Western Power practice and regulatory requirements to mitigate safety hazards. This is an ongoing program of works which was that commenced in 2003/04 following several fatalities involving PVC customer service connections.
works to prevent HV overhead conductor clashing	Following a fire at Tenterden in early 2007 involving the death of two people, the Director of Energy Safety issued an order against Western Power requiring the installation of a means to prevent HV overhead conductor clashing. While this order applies specifically to the South Coastal and Great Southern regions, it also requires that Western Power prepare strategies to mitigate the risk across the SWIS. A long-term works program has been initiated to address this requirement and mitigate the risk of conductor clashing.

Bushfire mitigation wires down	In recent years there have been several incidents where the failure of overhead distribution conductors has caused fires that resulted in property damage and/or serious injury or death. Investigation of these incidents has shown that the condition of pole top hardware, conductor corrosion, bird-caging, as well as cross arm and insulator failures are of particular concern. This strategy will specifically target high and extreme bushfire risk areas, and will replace overhead distribution conductors and associated pole top hardware assessed by the overhead line inspection program to be in poor condition.
Fire-safe fuses	This strategy involves identifying Drop Out Fuses (DOFs) in high and extreme fire zones, and replacing them with boric acid fuses which are capable of arc-free operation. The specific units being targeted have a history of false operation and explosive failure under certain conditions. In addition, as the typical life expectancy of a DOF is approximately 35 years, further units will require replacement as they become unsuitable for service.
Power Quality compliance reinforcement	This strategy provides remedial works to maintain network power quality within statutory limits. The primary drivers of this expenditure are customer complaints regarding power quality issues, and compliance with the requirements of the Technical Rules.
Pole top replacement in high fire risk areas	Following several safety incidents relating to the condition of pole tops on the distribution network, Western Power has adopted a strategy for high fire risk areas involving the replacement of pole tops that do not comply with *Guidelines for the Design, Construction and Maintenance of Overhead Lines* (HB C(b)1).
Pole top switches replacement	This is an ongoing program to replace pole top switch earthing mats due to the occurrence of a near fatality incident. While temporary measures have been taken to safeguard staff, continuation of this work is needed to complete implementation of a permanent solution. The rectification of this safety issue is clearly required under the provisions of the Electricity (Supply Standards & System Safety) Regulation 2001.
Targeted LV network upgrades	This is a new strategy being adopted by Western Power that involves the undergrounding of those parts of the low voltage overhead network that do not comply with regulatory requirements due to poor power quality or reliability performance. The program of work will be undertaken on a targeted basis, with selection and prioritisation of work based on a combination of the fault history, capacity requirements, and the age of the overhead assets.
'Hills' covered conductor	This strategy involves the installation of covered conductor in areas of high fire risk and more extreme weather. It will substantially reduce bushfire risk, and contribute to reliability improvements. A particular focus of this initiative will be the Perth hills area which is classified as an extreme fire risk zone.
Distribution transformer noise mitigation works	This project involves 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*.
Street light switch-wire replacement	This strategy focuses on removing streetlight switch-wires that are assessed to be in poor condition and reconnecting the street lights direct to the LV mains via a PE Cell or timed control box.

3.3 Western Power's distribution capital expenditure proposals

Western Power is proposing to invest a total of $2.07 billion during the forthcoming access arrangement period on its distribution asset base. Figure 35 and Table 43 below list Western Power's historical and projected distribution capital expenditures.

Figure 35 shows that Western Power proposes to increase distribution capital expenditure from an average of $467 million per annum in the 2006/07 to 2008/09 period to an average of $691 million per annum over the forthcoming access arrangement period. This represents an increase of approximately 58%, of which approximately 50% is driven by demand related growth, while the balance is related to enhanced asset replacement practices, network reliability improvements, changing standards, and compliance with changing safety, statutory and environmental requirements.

Figure 35: Distribution capital expenditure ($ million real as at 30 June 2009)

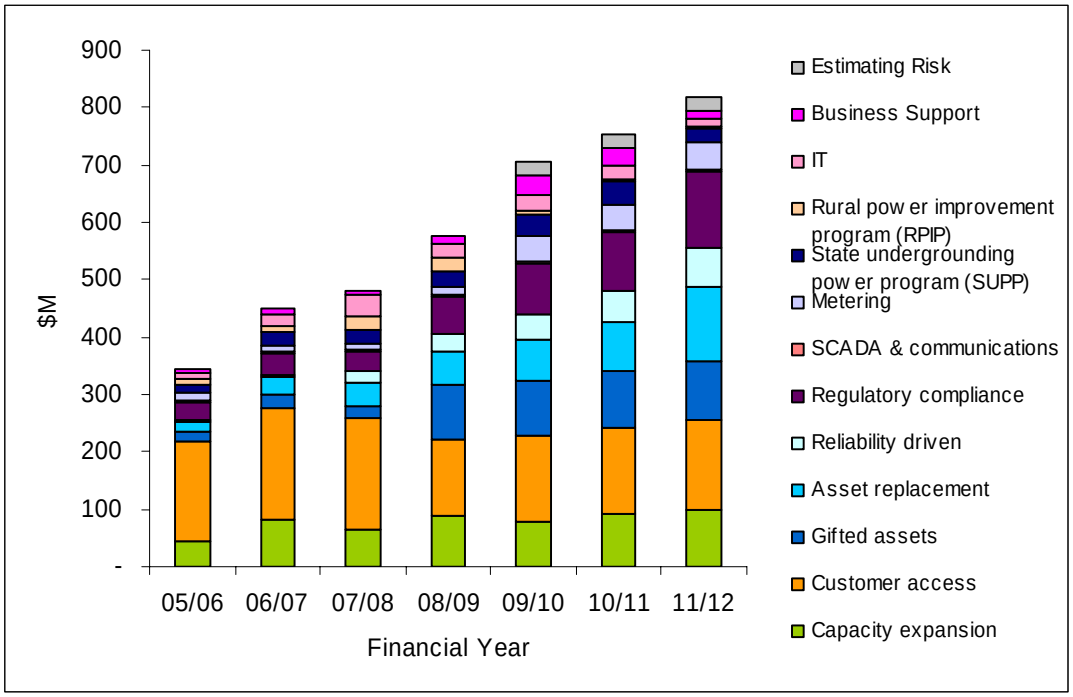


Table 43: Distribution capital expenditure ($ million real as at 30 June 2009)

Expenditure category	05/06	06/07	07/08	08/09	09/10	10/11	11/12
GROWTH							
Capacity expansion	44.76	81.67	63.23	89.20	77.78	90.59	97.30
Customer access	171.81	194.8	195.15	131.89	149.16	151.93	157.61
Gifted assets	18.54	23.67	20.91	94.30	97.92	99.74	103.47
Estimating Risk (3.5%)	*0*	*0*	*0*	*0*	*11.37*	*11.98*	*12.54*
ASSET REPLACEMENT & RENEWAL							
Asset replacement	15.68	29.37	39.65	61.14	71.48	84.26	128.83
State undergrounding power program (SUPP)	15.48	22.66	22.66	29.29	35.32	38.41	22.69
Metering	13.07	11.52	12.77	12.60	45.63	46.06	47.69
Estimating Risk (3.5%)	*0*	*0*	*0*	*0*	*5.34*	*5.91*	*6.97*
IMPROVEMENT IN SERVICE							
Reliability driven	6.17	5.90	19.16	28.78	44.41	54.41	67.40
Rural power improvement program (RPIP)	7.32	10.35	23.69	22.00	8.41	5.40	3.13
SCADA & communications	2.61	2.41	2.16	2.57	5.91	5.93	5.93
Estimating Risk (3.5%)	*0*	*0*	*0*	*0*	*2.06*	*2.30*	*2.68*
COMPLIANCE							
Regulatory compliance	27.72	36.54	35.74	65.57	88.53	103.14	135.10
Estimating Risk (3.5%)	*0*	*0*	*0*	*0*	*3.08*	*3.62*	*4.73*
CORPORATE							
IT	10.82	19.35	34.99	24.58	27.30	21.90	13.34
Business support	6.44	9.77	9.35	13.55	34.91	33.00	13.59
Total (M)	**340.44**	**448.03**	**481.29**	**575.47**	**708.60**	**758.55**	**823.00**

Further details of the forecast capital expenditures are set out in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

3.4 Expenditure deliverability and risk assessment

3.4.1 Capability to deliver the proposed works

Section 5 of Part A explained Western Power's plans for delivering increased expenditure over the forthcoming access arrangement period in light of resource constraints. As noted in that section, to ensure the delivery of the planned increases in both operating and capital expenditure, Western Power has developed a long-term Strategic Delivery Framework. Under that framework, Western Power proposes to deliver the planned distribution capital works through the following arrangements:

- All customer-funded distribution capital works (including subdivision interface works, as developers undertake the installation of distribution networks in new developments) will be delivered through program alliance arrangements.

- Preferred vendors and suppliers engaged under AS 4000 series contracts will deliver works such as:

    - cable laying;

    - State underground power program works;

    - replacement of PVC service connections; and

    - pole base reinforcements.

- New commercial agreements (performance-based contracts) will be established with a number of key distribution contractors, with a view to maintaining competitive tension in the market. These arrangements reduce the risk of any particular contractor not being able to meet recruitment targets. To assist contractors to improve their resource planning, Western Power will provide forecasts of work to be allocated to the contracting market via regular industry briefings.

- The internal workforce will be increased through targeted recruitment initiatives. Internal resources, along with Performance Base Contractors, will be delivering:

    - capacity expansion works;

    - asset replacement works;

    - reliability programs; and

    - capital works associated with safety and regulatory compliance.

3.4.2 Risks arising if proposed works are not undertaken

In addition to ensuring the deliverability of its proposed distribution capital expenditure program, Western Power has also undertaken an analysis of the risks that would arise if distribution capital expenditure were to be reduced from the levels proposed for the forthcoming access arrangement period.

As already noted in section 3.2.3, Western Power's ability to deliver improved distribution system reliability is limited because of resource limitations and competing business priorities. In prioritising its proposed works program in light of these resource constraints and its risk assessments, Western Power has reduced the following categories of expenditure below the level that would be economically justifiable in a world where resources are not constrained:

- asset replacement;

- capacity expansion; and

- reliability-driven works.

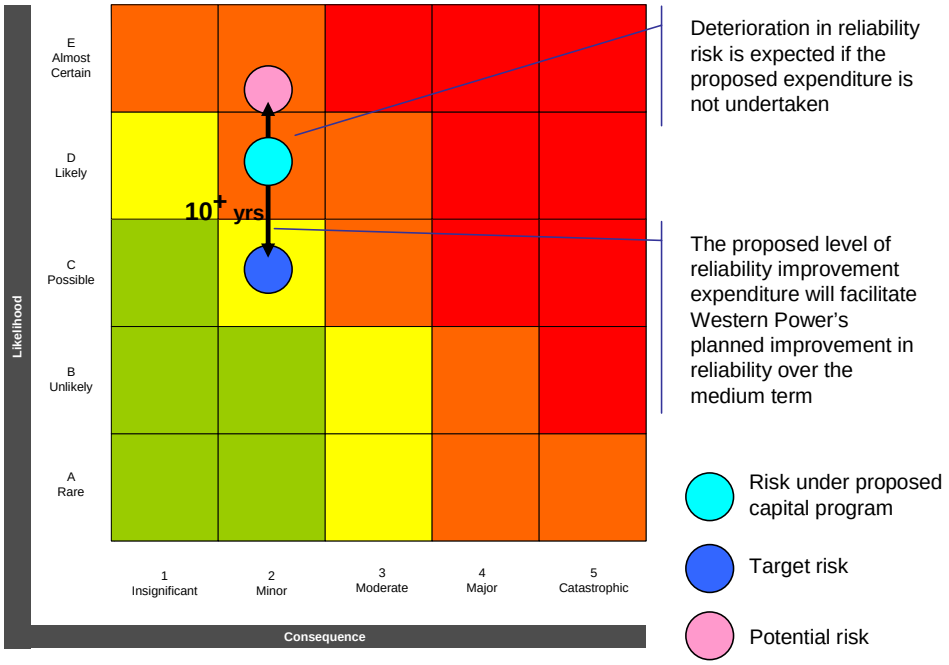
In determining the proposed level of expenditure in the face of resource constraints and risk assessment Western Power has adopted the following approaches:

- In relation to network performance improvement works, the available resources will be allocated to those projects that maximise SAIDI improvement per dollar of capital investment. As a result, economically justified programs with the lowest SAIDI improvement per dollar of investment have been deferred. This results in Western Power's ability to deliver SAIDI improvements over the forthcoming access arrangement period being limited to 29 minutes.

- In relation to capacity expansion works, the available resources will be concentrated on the capacity 'hot spots' in the distribution network. As a consequence of the resource constraints, feeder utilisation levels are expected to trend back to 2006/07 levels.

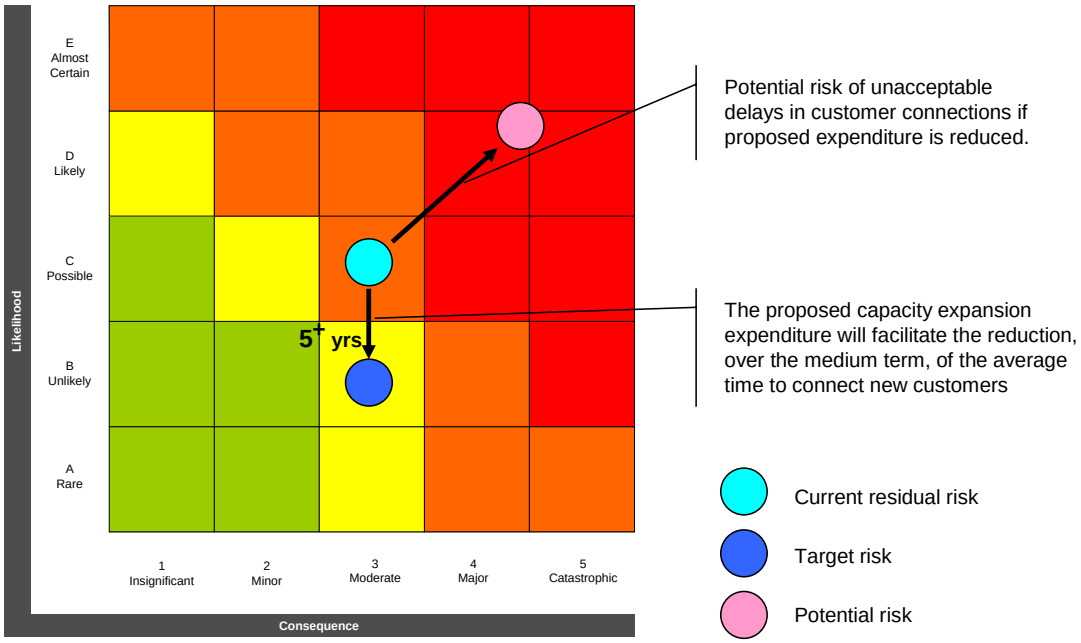
Western Power's analysis indicates that reductions in distribution capital expenditure to levels below those proposed for the forthcoming access arrangement period would lead to an unacceptable increase in the risk of failing to achieve target reliability improvements. This is depicted diagrammatically in Figure 36 below.

Figure 36: Risk analysis matrix - Achievement of target reliability



Western Power's analysis also indicates that any reduction in the proposed distribution network capacity expansion expenditure would increase the risk of unacceptable delays in new customer connections, as shown in Figure 37 below.

Figure 37: Risk analysis matrix - Customer connections



Western Power has also assessed the risks associated with reductions in its proposed distribution capital expenditure programs in terms of public safety. It has been found that reductions in the level of proposed distribution capital expenditure would result in an unacceptable increase in risk exposure in this critical area.

3.5 Concluding comments

In the first access arrangement period, Western Power delivered a distribution capital works program involving substantially increased levels of expenditure, compared to previous years. In the forthcoming access arrangement period, Western Power proposes further substantial increases in distribution capital expenditure, noting that this equates to approximately 80% of the identified "unconstrained" distribution capital works requirements. The key drivers of the proposed increases are:

- the unprecedented growth in electricity demand, the accompanying increase in the level of utilisation of the existing distribution asset base and the associated need to increase the capacity of the distribution network to ensure the maintenance of present levels of reliability;
- the need to replace aging distribution infrastructure, to ensure the maintenance of present levels of reliability;
- the need to undertake reliability performance improvement works, to the extent that resource constraints and other work priorities permit;
- the on-going impacts of previously constrained expenditure;
- more onerous health, safety and environmental regulations; and
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

Western Power has undertaken a careful assessment of the capability of the company to deliver the proposed works program, taking into account the limited availability of suitable resources to undertake the work. The company has developed a detailed resourcing plan to ensure that it is capable of delivering the planned increases in expenditure. Whilst Western Power recognises that delivery of the planned expenditure program will be a challenge, the company is confident that it has the plans and arrangements in place to deliver the proposed works.

Western Power has also undertaken an assessment of the risks associated with reducing distribution capital expenditure to levels below those proposed, and it has found that such reductions would result in unacceptable increases in risk exposure in relation to the achievement of planned reliability improvements, public safety and new customer connection rates.

The information presented in this document and the supporting appendices:

- provides detailed substantiation of Western Power's proposed distribution capital expenditure for the forthcoming access arrangement period, in accordance with the requirements of the Code and the Authority's *Guidelines for Access Arrangement Information;* and

- demonstrates that Western Power's forecast distribution capital expenditure can be reasonably expected to satisfy the requirements of the new facilities investment test, and can therefore be included in Western Power's forward looking efficient cost of providing reference services for the forthcoming access arrangement period in accordance with section 6.51 of the Code.

4 Distribution operating and maintenance expenditure

4.1 Introduction

This section describes and substantiates the operating expenditure forecasts for the distribution network. The operating expenditure requirements of the distribution network must be determined in light of the need to 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, as far as practicable; and
- facilitating the minimisation of total life-cycle costs by optimising operations and maintenance, and capital expenditures.

The remainder of this section is structured as follows:

- section 4.2 summarises the drivers of increased operating expenditure in the forthcoming access arrangement period, focusing on the principal activities planned by Western Power;
- section 4.3 presents Western Power's distribution network operating expenditure proposals;
- section 4.4 presents an overview of Western Power's assessment of the deliverability of the proposed operating expenditure program, as well as a risk assessment of the proposed program; and
- section 4.5 presents concluding comments.

4.2 Drivers of increased distribution operating expenditure

Section 4.2 of Part B explained that in relation to transmission capital expenditure, there are four principal drivers of increased investment from historic levels. These are:

- the unprecedented growth in electricity demand and the connection of additional generation capacity and new loads;
- the on-going impact of previously constrained expenditure;
- more onerous safety, health, and environmental regulations; and
- the continuing increase in unit costs, particularly in light of the resources boom in Western Australia.

These factors remain highly relevant in explaining the required increase in distribution operating expenditure for the forthcoming access arrangement period. However, rather than repeating the description of these factors in relation to distribution operating expenditure, Table 44 highlights the principal distribution operating activities planned by Western Power in the forthcoming access arrangement period.

Table 44: Principal operating expenditure activities for the forthcoming access arrangement period

Recurrent preventative maintenance	During the next access arrangement period Western Power proposes to align all preventative routine maintenance with the relevant asset mission statement which will substantially increase the forecast expenditure on these works. In addition, increasing inspections and testing will result in increased volumes of remedial maintenance being identified with a corresponding increase in associated expenditures.
Pole maintenance	This distribution maintenance cost category relates to the remedial work arising from a new inspection regime which combines pole ground line inspections with pole top and line inspections. Recent data has been used to determine the link between these new inspections and the quantity of remedial conditions identified.
Power pole bundled inspections	Western Power has bundled the ground line inspection and treatment of poles with above ground pole inspection and line inspections. This has resulted in efficiency savings but it has also necessitated the use of trained linespersons to carry out the inspections. In addition, it is proposed to enhance the pole ground line inspection process to include either full excavation of the soil around the base of the pole to a depth of approximately 500 mm (in line with current Australian practice) or to introduce ultrasonic pole strength testing. These changes are necessary to improve the current rate of pole failures to the industry average.
Ground-mounted switchgear / substation inspection and maintenance	Historic budget constraints have resulted in only minimal expenditures on the inspection and maintenance of ground mounted substations and switchgear. Western Power proposes to commence an inspection and maintenance regime of these assets in accordance with current asset mission statements.
Emergency response generators	Western Power has a requirement under the *Electricity Industry (Network Quality and Reliability of Supply) Code 2005*, where practicable, to supply generators for customer supplies if planned outages are expected to exceed 6 hours or 4 hours on days where the temperatures are expected to exceed 30 degrees. Additional expenditures have been included for generator deployment in the forthcoming access arrangement period.
Vegetation management	Vegetation management in the SWIS is governed by a vegetation management strategic plan. The latest edition of this plan adopts a risk-based approach, under which high fire risk zones and urban areas were inspected and cut on an annual basis, moderate fire risk zones on a two yearly cycle and low fire risk zones on a three yearly cycle. Previously, moderate risk zones were inspected and cut on a 3 yearly cycle but this was found to deliver inadequate performance because regrowth into the clearance area was occurring prior to the next inspection, resulting in an unacceptable number of fires occurring. The reduced time between cutting cycles in moderate risk fire zones from three years to two accounts for a significant proportion of the additional proposed expenditure over the next regulatory period.

Bulk globe replacement	A four year bulk globe replacement program was commenced during the current access arrangement period based on results of similar bulk globe replacement trials carried out within Australia. These trials indicated that bulk globe replacement programs are more efficient than replacing lamps on failure. A further study carried out by Western Power has indicated that the increase in costs to reduce the bulk globe replacement cycle from four years to three would be offset by the increase in customer safety resulting from the reduced luminaire outages; increased lumen output (achieved because lamps would be replaced prior to their lumen output falling below 70% of their initial value); and reduction in corrective fault repairs.
Energy Solutions Research and Development	As noted in section 4.2 of Part A of this document, Western Power has established a customer vision, which is to develop further as an energy solutions business. In order to achieve this goal Western Power needs to investigate and invest in alternative and emerging technologies. This new program covers feasibility investigations and the development of innovative electrical engineering solutions including: • advanced techniques for measuring peak reductions and efficiency savings; • advanced technology for power grid sensing, communications, analysis and power flow control; • low carbon generation (distributed generation) which removes the need for additional towers and infrastructure, enabling efficient capital expenditure deferral and significant environmental gains; • wide-area measurement and control networks including data mining, visualization, advanced computing, and communications in a highly distributed environment; • new reliability techniques, including communications network capabilities relating to outage and blackout scenarios; and • research into customer behaviour modification and energy efficiency education.

4.3 Western Power's forecast distribution operating expenditure

Western Power's total distribution operating expenditure forecast by category for the next access arrangement period is shown in Figure 38 and Table 45 below.

The forecast operating expenditure represents a real increase of approximately 60% over the total actual and forecast expenditures in the current period.

Figure 38: Distribution operating expenditure ($ million real as at 30 June 2009)

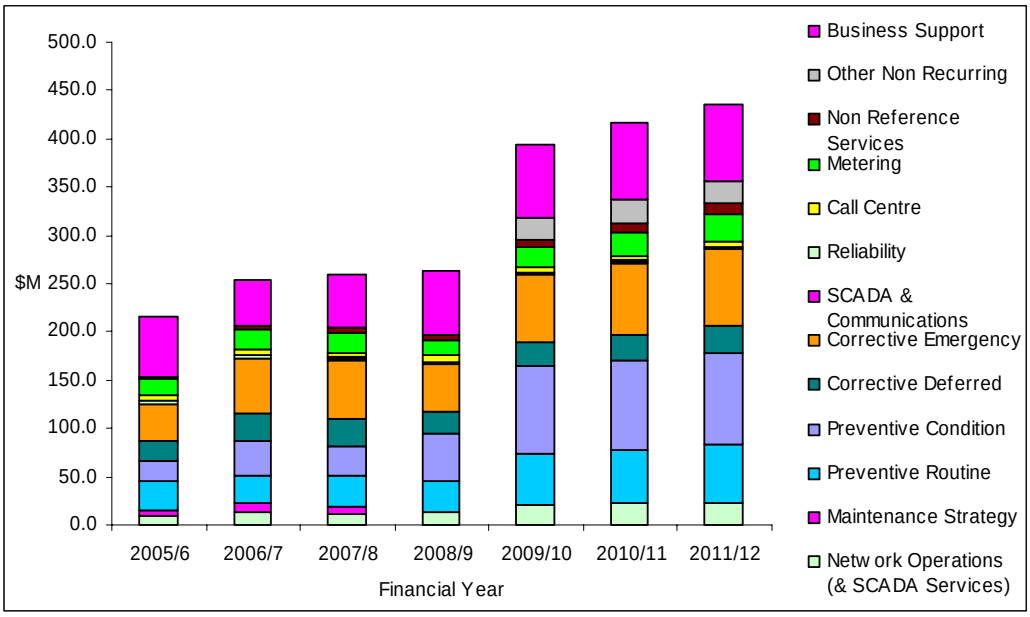


Table 45: Distribution operating expenditure ($ million real as at 30 June 2009)

Item	05/06	06/07	07/08	08/09	09/10	10/11	11/12
Maintenance strategy[31]	5.80	9.58	8.86	0	0	0	0
Preventive routine	30.89	28.95	30.90	31.74	54.11	56.33	59.36
Preventive condition	20.56	35.62	31.82	49.52	91.22	93.07	95.91
Corrective deferred	20.18	27.66	28.11	22.82	23.33	25.71	28.45
Corrective emergency	38.29	56.50	60.45	48.83	71.03	74.31	78.45
Reliability	2.31	3.77	1.55	1.95	1.06	1.08	1.11
SCADA & communications	0.87	1.40	1.24	1.08	1.39	1.43	1.62
Non reference services	2.18	4.84	6.13	5.30	7.42	8.61	9.82
Network operations[32]	9.34	13.33	10.77	13.56	20.03	21.83	23.20
Other (non recurring)	0	0	0	0.03	22.24	25.47	23.05
Call Centre	6.26	5.26	5.12	6.40	5.37	5.47	5.55
Metering	17.48	20.11	19.23	15.9	20.21	24.46	29.07
Business support	61.68	46.95	55.35	65.82	76.58	78.70	80.80
Total (M)	**215.84**	**253.97**	**259.53**	**262.95**	**393.99**	**416.47**	**436.39**

The operating expenditure forecasts include the impacts of:

- labour, contract services and material cost escalation expected over the forthcoming access arrangement period;

[31] Maintenance strategy activities are treated as a component of the direct overhead cost from 08/09 onwards

[32] Includes SCADA Services costs that support NOCC and SOCC mainframe SCADA systems etc.

- growth-related distribution capital expenditure on operating expenditure requirements;

- the proposed increase in preventative routine and condition maintenance, and non-recurrent operating expenditure over the period; and

- the operating expenditure efficiencies expected from Western Power's proposed distribution replacement and refurbishment capital expenditure.

In relation to the last point, Western Power's operating expenditure forecast reflects the reductions in operating expenditure that are expected to result from the replacement or refurbishment of assets at or near the end of their operational lives. Operating expenditure savings relate primarily to avoidance of condition maintenance works as new assets do not require any condition maintenance expenditure over the initial years of their lives. This reduction has been estimated by PB to be 18% of the costs of maintaining and operating assets with approximately half their service lives remaining.

Further details of the forecast operating expenditures are set out in the report prepared with the assistance of consultants PB, titled *Capital and Operating Expenditure: 2009/10 to 2011/12*, which is included as Appendix 1 to this document.

4.4 Expenditure deliverability and risk assessment

4.4.1 Capability to deliver the proposed works

Section 5 of Part A explained Western Power's plans for delivering increased expenditure over the forthcoming access arrangement period in light of resource constraints. Under Western Power's Strategic Delivery Framework, the company proposes to deliver the planned distribution operating and maintenance expenditures through the following arrangements:

- Internal resources and performance-based contracts will together undertake 85% of the proposed work in key areas including:

    - preventative condition-based maintenance;

    - routine maintenance;

    - corrective emergency maintenance; and

    - reliability driven maintenance.

- The remaining 15% of distribution operations and maintenance work over the next access arrangement period will be undertaken by preferred vendors and suppliers engaged under stand-alone AS 4000 series contracts. Work to be delivered via these mechanisms includes:

    - siliconing;

    - vegetation management; and

    - pole base and pole top inspections.

4.4.2 Risks arising if proposed works are not undertaken

In addition to ensuring the deliverability of its proposed distribution operating expenditure program, Western Power has also undertaken an analysis of the risks that would arise if distribution operating expenditure were to be reduced from the levels proposed for the forthcoming access arrangement period.

Over the forthcoming access arrangement period, Western Power proposes to undertake 100% of the unconstrained distribution operating expenditure program. This program has been assessed by Western Power (with the assistance of consultants PB) as being the minimum operations and maintenance works required to enable Western Power to maintain an acceptable level of compliance with applicable regulatory obligations, having regard to the associated risks.

As noted in section 4.3 of Part A, Western Power recognises that 100% compliance with all obligations remains a stretch target for the company as it plans for the forthcoming access arrangement period. Western Power's risk analysis indicates that reductions in distribution operating expenditure to levels below those proposed for the forthcoming access arrangement period would lead to:

- unacceptable increases in the risk of deterioration in the reliability performance of the distribution network over the medium term (that is, after the end of the forthcoming access arrangement period);
- increases in the risk of unacceptable delays in new customer connections during the next access arrangement period; and
- unacceptable increases in public safety risks during the next access arrangement period and beyond.

4.5 Concluding comments

The total forecast distribution operating expenditure for the next access arrangement period represents a real increase of approximately 60% over the total actual and forecast expenditures of the current period. It is noteworthy that the actual expenditure in the current period is expected to exceed the regulatory allowance for the period by some 23%. This increase - funded entirely by Western Power - provides an indication of the substantial upward pressures on operating expenditures being faced by the company.

The proposed further increases in operating expenditure for the next access arrangement period are driven primarily by substantial increases in preventative routine and condition maintenance and associated support functions, additional non-recurrent distribution operating expenditure projects, and significant further increases expected in labour, contracts and materials prices. Western Power is taking all possible steps to mitigate and manage input price increases, however these price rises are substantially beyond the company's control.

Western Power has undertaken a careful assessment of the capability of the company to deliver the proposed operating expenditure program, taking into account the limited availability of suitable resources to undertake the work. The company has developed a detailed resourcing plan to ensure that it is capable of delivering the planned increases in expenditure. Whilst Western Power recognises that delivery of the planned expenditure program will be a challenge, the company is confident that it has the plans and arrangements in place to deliver the proposed works.

Western Power has also undertaken an assessment of the risks associated with reducing distribution operating expenditure to levels below those proposed, and it has found that such reductions would result in unacceptable increases in risk exposure in relation to the maintenance of adequate network reliability over the medium term, public safety and new customer connection rates.

The information presented in this document and the supporting appendices provides detailed substantiation of Western Power's proposed distribution operating expenditure for the forthcoming access arrangement period, in accordance with the requirements of the Code and the Authority's *Guidelines for Access Arrangement Information.*

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[33] and depreciation.

Western Power's approach to establishing the value of the distribution capital base is consistent with that applied in relation to the transmission capital base, as described in Section 6 of Part B of this document.

The remainder of this section is structured as follows:

- section 5.2 describes valuation of the distribution capital base as at 30 June 2009 in light of the Code provisions and the applicable provisions contained in Western Power's approved access arrangement for the period from 1 July 2006 to 30 June 2009;

- section 5.3 summarises Western Power's approach to depreciation for the distribution capital base; and

- section 5.4 provides details of the calculations of the distribution capital base value from 1 July 2009, and for each subsequent year of the forthcoming access arrangement period.

5.2 The valuation of the distribution capital base as at 30 June 2009

Sections 6.2 and 6.3 of Part B provide an overview of the Code provisions relating to the capital base, and Western Power's approach to valuation of the transmission capital base; as noted above, Western Power has applied the same approach in the valuation of the distribution capital base.

In accordance with the requirements of the Code, Western Power has determined the distribution capital base at 30 June 2009 by:

- "rolling forward" the capital base value at the commencement of the previous access arrangement period (30 June 2006) as set out in section 6.1 of Western Power's approved access arrangement for the period 1 July 2006 to 30 June 2009;

- applying the consumer price index to the rolled-forward capital base value;

- adding all new facilities investment incurred during the first access arrangement period; and

- deducting depreciation.

In accordance with the requirements of section 6.52 of the Code, new facilities investment undertaken during the first access arrangement period has been added to the capital base. To demonstrate that Western Power's capital expenditure satisfies

[33] 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.

the new facilities investment test (NFIT), Western Power commissioned consultants PB to undertake a review. The report from PB titled, *Assessment of AA1 Capex – NFIT Submission*, is provided as Appendix 5 to this document.

Table 46 below sets out the approved distribution capital base value as at 30 June 2006, expressed in real dollars as at 30 June 2009.

Table 46: Approved distribution capital base value at 30 June 2006 ($ million real as at 30 June 2009)

Asset Group	Value
Distribution lines - wood poles	519.2
Distribution lines - steel poles	0.0
Distribution underground cables	588.0
Distribution transformers	223.8
Distribution switchgear	119.3
Street lighting	5.8
Distribution meters and services	184.8
Distribution IT&T	16.9
Distribution SCADA & communications	14.1
Distribution Other, non-network	56.3
Distribution Land & Easements	23.5
TOTAL	**1,751.7**

Table 47 below lists the new facilities investment undertaken during the first access arrangement period which will be added to the capital base.

Table 47: New facilities investment to be added to the distribution capital base ($ million real as at 30 June 2009)

Asset Group	Year of expenditure		
	2006/07	2007/08	2008/09
Distribution lines - wood poles	96.8	117.7	163.0
Distribution lines - steel poles	0.0	0.0	0.0
Distribution underground cables	183.8	175.5	205.6
Distribution transformers	59.9	57.7	66.9
Distribution switchgear	46.3	53.0	65.5
Street lighting	18.1	17.9	20.8
Distribution meters and services	11.5	12.8	12.6
Distribution IT&T	19.3	35.0	24.6
Distribution SCADA & communications	2.5	2.4	3.0
Distribution Other, non-network	9.8	9.3	21.0
Distribution Land & Easements	0.0	0.0	0.0
TOTAL	**448.0**	**481.3**	**582.9**

Details of the calculation of the distribution capital base value as at 30 June 2009 are set out in Table 48 below.

Table 48: Derivation of Distribution Capital Base as at 30 June 2009 ($ million real as at 30 June 2009)

Financial year ending:	30 June 2006	30 June 2007	30 June 2008	30 June 2009
Opening capital base value		1,751.7	2,088.7	2,454.1
less Depreciation		-106.8	-111.9	-121.4
plus New Facilities Investment		448.0	481.3	582.9
less Redundant Assets		-4.2	-4.0	-3.9
Closing capital base value	**1,751.7**	**2,088.7**	**2,454.1**	**2,911.7**

It is noted that the capital base value as at 30 June 2009 reflects a forecast of capital expenditure (new facilities investment for the year ending 30 June 2009). At the time of preparing this document, actual capital expenditure data for the whole of the 2008/09 year are not available. Western Power therefore proposes that at the next access arrangement review:

- the capital base value at the commencement of the next access arrangement period will be adjusted (in real terms) for any difference between the forecast and actual capital expenditure for the year ending 30 June 2009; and

- an adjustment to the target revenue in the next access arrangement period will be made to compensate Western Power (or users) for the return on assets revenue foregone (or additional revenue recovered) over the forthcoming access arrangement period in respect of the 2008/09 financial year capital expenditure forecast error.

It is noted that under these arrangements:

- the target revenue for the forthcoming access arrangement period will not be adjusted for any differences between actual capital expenditure and the forecast of capital expenditure for the 2008/09 year used to establish the opening capital base value at 30 June 2009; however

- adjustments made at the next access arrangement review will have the effect of ensuring that the present value of the total revenue recovered by Western Power over the forthcoming access arrangement period and subsequent access arrangement periods will be equivalent to the amount that would be recovered if actual capital expenditure for 2008/09 had been forecast with 100% accuracy; and

- Western Power and users are therefore held economically neutral in the event that there are any differences between the actual capital expenditure and the forecast of capital expenditure for the 2008/09 year used to establish the opening capital base value at 30 June 2009.

5.3 Western Power's approach to depreciation – distribution assets

Under the approach to calculating target revenue set out in Subchapter 6.2 of the Code[34], 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.

Table 49 sets out the economic lives for distribution assets for regulatory purposes.

Table 49: Distribution asset groupings and economic lives for depreciation purposes

Asset group	Economic Life (years) for depreciation purposes
Distribution lines - wood poles	41 years
Distribution lines - steel poles	50 years
Distribution underground cables	60 years
Distribution transformers	35 years
Distribution switchgear	35 years
Street lighting	20 years
Distribution meters and services	25 years
Distribution IT&T	10.16 years
Distribution SCADA & communications	10.16 years
Distribution Other, non-network	10.16 years

Western Power generally adopts a straight-line approach to depreciation over the life of assets. However, accelerated depreciation will be applied in respect of those existing distribution assets that will be decommissioned as a result of the retrospective undergrounding project undertaken by Western Power on behalf of the Western Australian government.

Table 50 below provides details of accelerated depreciation by asset category.

[34] "Calculation of Service Provider's Costs".

Table 50: Distribution redundant capital by asset class ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012
Distribution lines - wood poles	2.8	2.8	2.8
Distribution lines - steel poles	0.0	0.0	0.0
Distribution underground cables	0.0	0.0	0.0
Distribution transformers	0.8	0.7	0.7
Distribution switchgear	0.2	0.2	0.2
Street lighting	0.0	0.0	0.0
Distribution meters and services	0.0	0.0	0.0
Distribution IT&T	0.0	0.0	0.0
Distribution SCADA & communications	0.0	0.0	0.0
Distribution Other, non-network	0.0	0.0	0.0
Distribution Land & Easements	0.0	0.0	0.0
TOTAL	**3.8**	**3.7**	**3.6**

5.4 Proposed distribution capital base and depreciation values

As noted in section 5.2 above, Western Power has adopted a distribution capital base of $2,911.7 million as at 30 June 2009.

Table 51 below provides details of the composition of the distribution capital base as at 30 June 2009, by asset group.

Table 51: Distribution Initial Capital Base as at 30 June 2009 ($ million real as at 30 June 2009)

Asset Group	Value
Distribution lines - wood poles	776.1
Distribution lines - steel poles	0.0
Distribution underground cables	1,099.1
Distribution transformers	363.4
Distribution switchgear	254.6
Street lighting	54.8
Distribution meters and services	160.7
Distribution IT&T	84.9
Distribution SCADA & communications	17.2
Distribution Other, non-network	77.3
Distribution Land & Easements	23.5
TOTAL	**2,911.7**

Table 52 below shows the distribution depreciation by asset class.

Table 52: Distribution depreciation by asset class
($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012
Distribution lines - wood poles	44.4	48.3	52.9
Distribution lines - steel poles	0.0	0.0	0.0
Distribution underground cables	25.4	27.5	29.7
Distribution transformers	18.4	19.5	20.8
Distribution switchgear	13.5	15.1	16.9
Street lighting	2.9	3.5	4.1
Distribution meters and services	21.6	23.5	25.4
Distribution IT&T	9.7	12.3	14.5
Distribution SCADA & communications	2.2	2.8	3.5
Distribution Other, non-network	8.8	12.2	15.5
Distribution Land & Easements	0.0	0.0	0.0
TOTAL	**146.8**	**164.7**	**183.2**

Table 53 below provides an overview of the forecast distribution capital base values for each year of the forthcoming access arrangement period.

Table 53: Assessment of distribution asset values
($ million real as at 30 June 2009)

Financial year ending:	30 June 2009	30 June 2010	30 June 2011	30 June 2012
Opening capital base value		2,911.7	3,282.0	3,679.8
less Depreciation		-146.8	-164.7	-183.2
plus Capital Expenditure		520.9	566.3	636.2
less Redundant Assets		-3.8	-3.7	-3.6
Closing capital base value	2,911.7	3,282.0	3,679.8	4,129.2

The forecast capital expenditure shown in Table 53 is net of forecast distribution capital contributions in the same years, as shown below:

Table 54: Forecast Distribution Capital Contributions (includes both cash and vested assets) by expenditure type ($ million real as at 30 June 2009)

	2009/10	2010/11	2011/12
GROWTH			
Customer Driven	62.7	63.9	66.3
Customer Driven – Vested Assets	97.9	99.7	103.5
ASSET REPLACEMENT AND RENEWAL			
State Undergrounding Power Program (SUPP)	26.5	28.8	17.0
IMPROVEMENT IN SERVICE			
Rural Power Improvement Program (RPIP)	0.0	0.0	0.0
Distribution Total ($M)	**187.1**	**192.4**	**186.8**

6 The cost of capital

6.1 Introduction

As noted in section 7, Part B of this document, 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 SWIN. Therefore, the analysis and findings presented in section 7, Part B of this document are equally applicable to this section. For ease of reference, Western Power's principal conclusions from section 7, Part B of this document are summarised below.

KPMG was commissioned by Western Power to provide specialist advice on the WACC, and KPMG's report is provided as Appendix 6 to this document. KPMG's detailed analysis demonstrates that a reasonable estimate of Western Power's WACC lies in the range of 8.5% to 11.1% real pre-tax (given the interest rates prevailing over the 60 trading day period to 23 June 2008).

Western Power proposes to apply a real pre-tax WACC of 8.95% for the purpose of determining its target revenue for the forthcoming access arrangement period. This value will be subject to revision to reflect the prevailing interest rates and the corresponding 10-year inflation outlook over a sampling period to be agreed (on a confidential basis) between the Authority and Western Power.

It is noted that the proposed WACC point value of 8.95% real pre-tax lies towards the lower end of the reasonable range estimated by KPMG. In selecting this point estimate, Western Power notes that:

- Western Power's proposal is consistent with principles espoused by the MCE's Expert Panel, and codified in the National Electricity Rules, regarding the need for regulatory decision-making on the WACC to be both consistent and predictable through time.

- Whilst it is toward the lower bound of the reasonable range estimated by KPMG, the proposed point estimate of the WACC is consistent with maintaining the financial viability of Western Power.

- Western Power's proposal is based on a thorough and robust analysis of the individual parameter values that must be combined to form a point estimate of the WACC that satisfies the requirements of the Code.

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*."

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 revenue requirements relating to the efficient forward-looking costs of a regulated company is often referred to as the "building block" approach.

The purpose of this section of the document is to explain how each cost element discussed in the earlier sections of this Part C are combined, along with other elements (namely, those listed in section 6.4 of the Code and in sections 5.43 and 5.48 of Western Power's approved access arrangement), 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 document 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 forward-looking efficient costs for the distribution network; and
- section 7.3 provides details of the composition of the target revenue, including figures showing the trend of distribution revenue and average prices to the end of the forthcoming access arrangement period.

7.2 Overview of "Building Block" Revenue Determination Method

The revenue requirements relating to the forward-looking efficient costs of providing reference services are calculated as the sum of a series of "building blocks" which are described briefly in Table 55, below. As already noted, the earlier sections of this document provide detailed analysis of each building block element.

Table 55: Summary of the building block components of forward-looking efficient costs of providing reference services

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

The forward-looking efficient cost of providing reference services is calculated using a model which adopts an end of year timing assumption for modelling revenues and expenses[35] in real terms. That model calculates the forward-looking efficient cost of providing reference services for each year of the access arrangement period in accordance with the following formula:

$$FC_t = r.RAB_{t,open} + Dep_t + O\&M_t$$

where

FC_t = forward-looking efficient cost of providing reference services in year t.

r = WACC (in real pre-tax terms).

$RAB_{t,open}$ = opening value of the regulatory asset base (which takes into account forecast new facilities investment over the access arrangement period).

Dep_t = depreciation in year t (which takes into account forecast new facilities investment over the access arrangement period).

$O\&M_t$ = forecast of operating and maintenance costs for year t.

[35] The calculations assume that all forecast capital expenditure occurs at the end of each relevant year. The effect of this assumption is to align the timing of forecast capital expenditure with that of all other costs and revenues, which are assumed to occur at the end of each relevant year.

A copy of the revenue model outputs is provided in Appendix 7.

7.3 Forecast target revenue for the distribution network

Western Power's forecast target revenue for the forthcoming access arrangement period is calculated in accordance with section 6.4 of the Code, which provides that the price control in an access arrangement must have the objectives of, amongst other things, giving Western Power an opportunity to earn revenue ("target revenue") for the access arrangement period from the provision of covered services.

Section 6.4 defines "target revenue" as 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, plus:

- any amount to reward Western Power for efficiency gains and innovation beyond the efficiency and innovation benchmarks in a previous access arrangement period (determined in accordance with any gain sharing mechanism in place); plus

- an amount (if any) relating to the recovery of costs of unforeseen events in a previous access arrangement period, determined under section 6.6; plus

- an amount (if any) relating to the recovery of costs of technical rule changes in a previous access arrangement period, determined under section 6.9; plus

- an amount (if any) determined under an investment adjustment mechanism in accordance with sections 6.13 to 6.18; plus

- an amount (if any) determined under a service standards adjustment mechanism in accordance with see sections 6.29 to 6.32; plus

- an amount (if any) relating to a requirement for Western Power to pay a tariff equalisation contribution to the Tariff Equalisation Fund in accordance with section 6.37A of the Code.

Of the various elements listed above, Western Power's target revenue for the distribution network for the forthcoming access arrangement period contains an amount relating to the investment adjustment mechanism, determined in accordance with sections 5.49 to 5.53 of Western Power's approved access arrangement for the period from 1 July 2006 to 30 June 2009.

In addition, Western Power's approved access arrangement for the period from 1 July 2006 to 30 June 2009 provides for the following matters to be taken into account in the determination of target revenue for the forthcoming access arrangement period:

- Section 5.43 of Western Power's approved access arrangement provides for an adjustment, termed the capital contributions adjustment mechanism to be made to the target revenue for the second and, if appropriate, subsequent access arrangement periods to reflect any difference between the deemed capital contributions in respect of the distribution network and the actual capital contributions received during the first access arrangement period.

- Section 5.48 of the approved access arrangement provides for the correction factor, DK_t, to apply in the first year of the forthcoming access arrangement

period to adjust for any difference between maximum regulated distribution network revenue and actual distribution network revenue, in relation to the financial year commencing on 1 July 2008.

Table 56 below shows the composition of distribution network revenue for the forthcoming access arrangement period.

Table 56: Composition of distribution network revenue ($ million real as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012	Present Value
Operating Costs	394.0	416.5	436.4	1,049.9
plus Depreciation	146.8	164.7	183.2	415.2
plus Redundant Assets	3.8	3.7	3.6	9.3
plus Return on Assets	260.6	293.7	329.3	741.3
plus Return on Working Capital	4.4	4.9	5.2	12.2
Forward-looking efficient costs	**809.5**	**883.5**	**957.8**	**2,228.0**
less Non-Reference Services Revenue	-4.7	-5.6	-6.4	-13.9
Distribution Reference Service Revenue	804.9	878.0	951.4	**2,214.0**
Deferred Distribution Reference Service Revenue				**177.3**
Smoothed Reference Services Revenue - DR_t	**640.7**	**800.8**	**1,001.0**	**2,036.7**
Unforeseen events revenue adjustment	0.0			0.0
plus technical rule change revenue adjustment	0.0			0.0
plus investment adjustment mechanism amount	32.9 (Forecast)			30.2
plus capital contribution adjustment mechanism amount	-91.6 (Forecast)			-84.1
Adjustments in accordance with previous access arrangement	**-58.8 (Forecast)**			**-53.9 (Forecast)**
Smoothed adjustments in accordance with previous access arrangement – $AA\#1_t$	**-17.0 (Forecast)**	**-21.2 (Forecast)**	**-26.5 (Forecast)**	**-53.9 (Forecast)**
Tariff Equalisation Contribution – TEC_t	**0.0**	**0.0**	**0.0**	**0.0**
Correction factor from 2008/09 – TK_t	**0.0 (Forecast)**			
Maximum distribution reference service revenue – MTR_t	**623.7 (Forecast)**	**779.6 (Forecast)**	**974.5 (Forecast)**	**1,982.8 (Forecast)**

Following advice from economic consultants, Western Power proposes to revert to the conventional regulatory treatment of capital contributions in the forthcoming access arrangement period. In the first access arrangement period, Western Power

adopted the so-called Queensland Method, which had the effect of artificially depressing price increases in the first access arrangement period. NERA's recommendations will have the effect of creating a one-off increase in Western Power's revenue requirements in the forthcoming access arrangement period.

To effect a transition to the conventional approach to capital contributions and also to manage the price increase in the forthcoming access arrangement period as a result of Western Power's increased expenditure needs, Western Power has deferred the recovery of $177.3 million ($ real as at 30 June 2009) for the distribution network to the third or subsequent access arrangement periods. In determining the price increases over the forthcoming access arrangement period and the consequential revenue deferral amount, Western Power has had regard to optimising the anticipated price increases at the commencement of, and during, the third access arrangement period.

The deferred amount of revenue is expressed in present value terms as at 30 June 2009. The deferral of revenue in this way is an extraordinary step which aims to further manage the price impacts on customers in the forthcoming access arrangement period.

Figure 39 and Figure 40 show the trend in distribution tariff revenues and average distribution tariff prices in real dollars for the year ending 30 June 2002 to the end of the first access arrangement period.

Figure 39: Trend in Distribution Tariff Revenue in Real Dollars at 30 June 2009

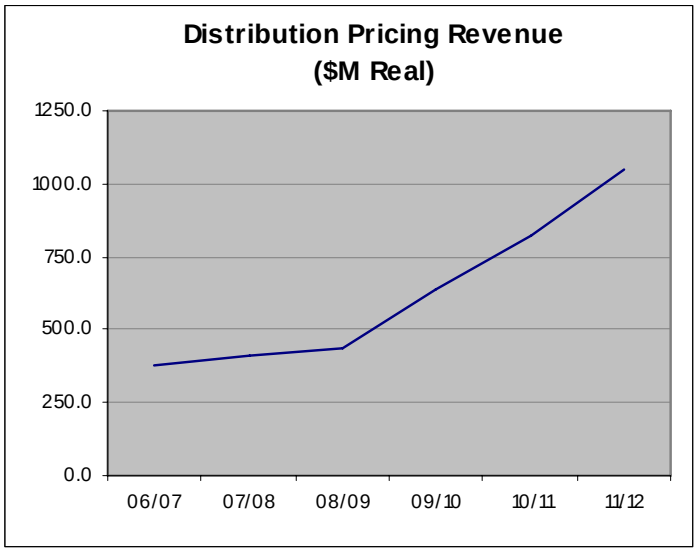
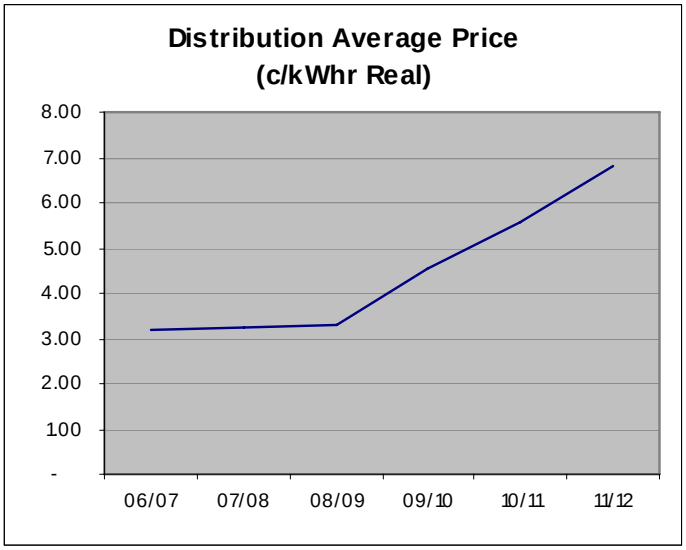


Figure 40: Trend in Distribution Average Price in Real Dollars at 30 June 2006



PART D: REGULATORY FRAMEWORK

1 Introduction to Part D

This Part D provides information that describes and explains the overall regulatory framework that will apply to Western Power's transmission and distribution networks for the forthcoming access arrangement period.

Part D is structured as follows:

- section 2 examines the Code provisions relating to the definition of reference services, and develops an appropriate definition of reference and non-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 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

The purpose of this section of the access arrangement information is:

- to outline the 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 proposes to provide to its customers for the forthcoming access arrangement period.

2.2 Code provisions

This document 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:

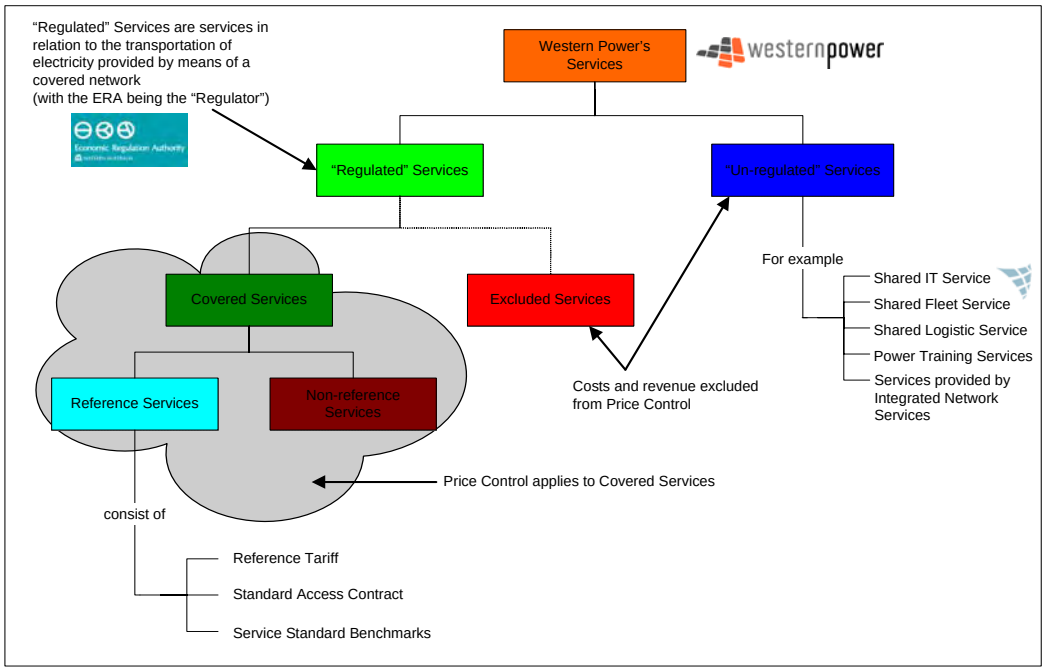
> "*covered service* means a *service* in relation to the *transportation* of electricity provided by means of a *covered network*, including:
>
> (a) a *connection service*; or
>
> (b) an *entry service* or *exit service*; or
>
> (c) a network use of system service; or
>
> (d) a *common service*; or
>
> (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 41 below depicts these service categories and their relationships:

Figure 41: 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)).

Western Power interprets the above Code provisions (particularly matters (b), (c) and (d)) 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 or an excluded service.

2.3 Western Power's reference and non-reference services

In the first access arrangement period, Western Power offered 11 *reference services* at *network exit points*:

1. Anytime Energy (Residential) Exit Service A1
2. Anytime Energy (Business) Exit Service A2
3. Time of Use Energy (Residential) Exit Service A3
4. Time of Use Energy (Business) Exit Service A4
5. High Voltage Metered Demand Exit Service A5

6. Low Voltage Metered Demand Exit Service A6
7. High Voltage Contract Maximum Demand Exit Service A7
8. Low Voltage Contract Maximum Demand Exit Service A8
9. Streetlighting Exit Service A9
10. Un-Metered Supplies Exit Service A10
11. Transmission Exit Service A11

Western Power also offered two entry services as *reference service*:

1. Distribution Entry Service B1
2. Transmission Entry Service B2

Western Power's experience during the first access arrangement period strongly suggests that no material changes are required to the definitions of these references services. However, the eligibility criteria and off-peak times for A3 and A4 have been modified to better suit existing metering capabilities.

Appendix 7 of the access arrangement includes the following information in relation to each reference service:

- a detailed description of the reference service;
- user eligibility criteria;
- the applicable reference tariff; and
- the applicable service standard benchmark.

Table 57 below provides a list of Western Power's non-reference services for the forthcoming access arrangement period compared to the first access arrangement period.

Table 57 - Non-reference Services

Non-Reference Service	Availability	
	First access arrangement	Revised access arrangement
Quotations for relocation of Transmission assets at the request of a user	✓	✓
Quotations for relocation of Distribution assets at the request of a user	✓	✓
Electricity Network Planning Studies	✓	✓
Re-inspection of a customer's facilities and equipment by a Western Power* Inspector	✓	✓
Rental of properties (including commercial & residential) that are in the capital base	✓	✓
Profit on sale of assets	✓	✓
Establishment and removal of a Temporary Builders Supply	✓	✓
Planning for and providing an escort for movement of high loads	✓	✓
Temporary removal of overhead service lead for work at a customer's premises	✓	✓
Insulate and make safe aerial conductors	✓	✓
Disconnection/Reconnection of overhead service leads or underground consumer mains at a customer's request	✓	✓
User Network Switching Services at the request of a user (on Western Power's* asset)	✓	✓
Jointly Owned Asset works	✓	×
Provide expertise to enable work to be undertaken in the vicinity of power lines	✓	✓
Sale of network schematics	✓	×
Services fees for Access Applications & Access Contracts	✓	✓
Costs recovered from asset damage due to a car accident, graffiti or vandalism	✓	✓
Extended metering services provided under the Metering Code Service Level Agreement	✓	✓
Access Billing Services Fees	✓	×
Transition Access Services	✓	×
Standby Access Services (Backup capacity)	✓	✓
Capital Works Application Fees	✓	×

The reasons for the removal of some non-reference services for the forthcoming access arrangement period are set out in Table 58 below:

Table 58: Reasons for removal of certain non-reference services from the revised access arrangement

Non reference service offered in first access arrangement	Reason for removal from revised access arrangement
Jointly owned asset works	The assets that this service relates to are jointed owned by Horizon Power and Alinta Gas (following the disaggregation of Western Power Corporation). As Western Power no longer has an interest in the jointly owned asset works this non-reference service is not required.
Sale of network schematics	Western Power does not sell network schematics and therefore this non-reference service is not required.
Transition Access Services	Western Power has offered transition tariffs to a number of customers since July 2001. Sufficient time has now passed to allow customers to transition to the standard tariffs. Customers currently paying transition tariffs will be offered a reference service in AA#2.
Access Billing Service Fees	Historically, the billing service fee was collected to cover the running costs of the TOAPPS system. The introduction of NetCIS as the single billing system for Western Power removes the historic reason for this fee. The costs of running NetCIS will be included within Western Power's operating expenditure forecasts and will recovered via reference tariffs.
Capital works applications fees	The proposed capital works applications fee ($340) was not implemented and therefore this non-reference service is not required.

Table 59 below sets out the forecast of annual revenue from the provision of non reference services for each year of the forthcoming access arrangement period. These revenue forecasts have been taken into account in the calculation of Western Power's target revenue for the forthcoming access arrangement period.

Table 59: Forecast of transmission non-reference services revenue ($ million real per annum as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012
Quotation for relocation of Transmission assets at the request of a user	1.1	0.6	0.6
Electricity Network Planning Studies	1.6	1.7	1.8
Rental of properties (including commercial & residential) that are in the capital base	1.5	1.5	1.6
Services fees for Access Applications & Access Contracts	1.6	1.7	1.8
Costs recovered from asset damage due to a car accident, graffiti or vandalism	0.0	0.0	0.0
Standby Access Services (Backup capacity)	0.5	0.5	0.5
Total Non Reference Services Revenue	6.3	6.0	6.3

Table 60: Forecast of distribution non-reference services revenue ($ million real per annum as at 30 June 2009)

Financial year ending:	30 June 2010	30 June 2011	30 June 2012
Quotation for relocation of Distribution assets at the request of a user	0.1	0.1	0.1
Planning for and providing an escort for movement of high loads	1.4	1.7	2.0
Temporary removal of overhead service lead for work at a customer's premises	0.2	0.3	0.3
Insulate and make safe aerial conductors	0.7	0.8	1.0
Provide expertise to enable work to be undertaken in the vicinity of power lines	0.4	0.5	0.6
Costs recovered from asset damage due to a car accident, graffiti or vandalism	1.5	1.7	1.9
Extended metering services provided under the Metering Code Service Level Agreement	0.1	0.1	0.1
Standby Access Services (Backup capacity)	0.3	0.3	0.3
Total Non Reference Services Revenue	**4.7**	**5.6**	**6.4**

2.4 Identification of Excluded Services

As at the time of lodging this document:

- 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 under section 6.35, Western Power may at any time request the Authority to determine under section 6.33 that one or more services provided by means of the SWIN are excluded services.

3 Service standard benchmarks

3.1 Introduction

Section 5 of Part A explained Western Power's recent service performance and the company's service delivery plans for the forthcoming access arrangement period, given the resourcing and work prioritisation challenges ahead. The Code requires Service Standard Benchmarks to be included in the access arrangement. The purpose of this section, therefore, is to outline the Code requirements and explain any proposed changes in Service Standard Benchmarks to those that were approved for the first access arrangement period.

This section is structured as follows:

- section 3.2 presents the Code provisions relating to service standard benchmarks;
- section 3.3 describes Western Power's service standard benchmarks for each transmission reference service;
- section 3.4 describes Western Power's service standard benchmarks for each reference service provided to users connected to the distribution network;
- section 3.5 briefly describes Western Power's other commitments and obligations regarding service delivery that do not form part of the service standard benchmarks; and
- section 3.6 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*."

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 Service standard benchmarks for transmission reference services

3.3.1 Proposed performance measures

In the first access arrangement period, Western Power applied System Minutes Interrupted (for meshed and radial circuits) and Circuit Availability as the measures of the service standard benchmarks for transmission reference services under the access arrangement.

Circuit Availability is the most commonly used indicator for transmission service standards in Australia, and therefore Western Power believes that it is appropriate to continue to apply this measure for the forthcoming access arrangement period.

System Minutes Interrupted measures performance from the end customer's perspective. This measure is calculated as MWh of electricity not supplied times 60, divided by the system peak demand in MW. Western Power proposes to continue to apply this performance measure during the forthcoming access arrangement period 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

- reliable historical records exist.

For System Minutes Interrupted, Western Power will continue to apply separate benchmarks for radial and meshed networks. It should be noted, however, that 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[36]) somewhat challenging.

In summary, Western Power proposes to use System Minutes Interrupted (for meshed and radial circuits) and Circuit Availability as the measures of the service standard benchmarks for transmission reference services under the access arrangement.

3.3.2 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 as defined in Table 61 and Table 62 below.

[36] Details of the service standards adjustment mechanism are set out in section 4.8 of this Part D.

Table 61: Definition of Circuit Availability

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:	• Non-transmission primary equipment (primary equipment operating at voltages less than 66 kV, including zone substation power transformers) • 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. • Duration of planned outages for major construction work, including periods where availability is temporarily restored, is to be capped at 14 days in calculating transmission line availability.
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.

Table 62: Definition of System Minutes Interrupted

Performance Indicator:	System Minutes Interrupted (for both Meshed and Radial Transmission Network)
Unit of measure:	Minutes
Source of data:	SCADA and System Operation Databases
Definition/Formula:	$\sum \frac{\text{MW Minutes of Unserved Energy}}{\text{System Peak MW}}$ (for both Meshed and Radial Transmission Network separately) Definition: System Minutes Interrupted (Meshed)- The summation of MW Minutes of unserved energy at substations which are connected to the meshed transmission network divided by the system peak MW. System Minutes Interrupted (Radial)- The summation of MW Minutes of unserved energy at substations which are connected to the radial transmission network divided by the system peak MW.
Exclusions:	• 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.

The above definitions include only two minor changes to the definitions that applied for the first access arrangement period:

- Western Power has implemented changes to its reporting systems which facilitate reporting on teed circuits. As a result, the proposed definitions no longer exclude teed circuits from the availability measure; and

- For an extended outage on a major construction program, the definition has been modified to clarify that the exclusion should continue to apply if the circuit is made temporarily available.

These modifications to the definitions are not considered to be material or controversial. Marked-up changes to the definitions are set out in the access arrangement.

3.3.3 Service standard benchmarks – transmission reference services

The service standard benchmarks applying to transmission reference services for the forthcoming access arrangement period are:

- consistent with customers' reasonable expectations 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 forthcoming access arrangement period.

Each of the service standard benchmarks for each year of the forthcoming access arrangement period is set out in Table 63 below. For further information on the rationale for these benchmarks, please refer to section 5 of Part A of this submission.

Table 63: Service standard benchmarks for transmission reference services

	Second access arrangement period		
	Year ending June 2010	**Year ending June 2011**	**Year ending June 2012**
Circuit Availability (% of total time)	98.0	98.0	98.0
System Minutes Interrupted (meshed network)	9.3	9.3	9.3
System Minutes Interrupted (radial network)	1.4	1.4	1.4

3.4 Service standard benchmarks: Reference services for users connected to the distribution network

3.4.1 Proposed performance measures

In the first access arrangement period, Western Power reported its distribution network performance for the following feeder classifications:

- CBD;
- Urban;
- Rural Short;
- Rural Long; and
- SWIN total

The feeder classification definitions are consistent with the Steering Committee on National Regulatory Reporting Requirements (SCNRRR). Western Power's earlier

feeder classifications were based on geographical area whereas the SCNRRR definitions relate to load density and high voltage carrier length.

For the purpose of Western Power's first access arrangement, performance has been monitored against the following indicators:

- SAIDI; and
- SAIFI.

Western Power proposes to continue to adopt these measures of distribution network performance for the forthcoming access arrangement period.

3.4.2 Definition of SAIDI and SAIFI performance indicators

The SAIDI performance indicator is defined as shown in Table 64 below:

Table 64: Definition of SAIDI

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). • Planned Outages. • Single Customer Interruptions. • *Force majeure* events.

The SAIFI performance indicator is defined in Table 65 below.

Table 65: Definition of SAIFI

Performance Indicator:	System Average Interruption Frequency Index (SAIFI)
Unit of measure:	Supply interruptions per annum
Definition:	Over a 12 month period, the total number of sustained (greater than 1 minute) customer interruptions (number) 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 with 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). • Planned Outages. • Single Customer Interruptions. • *Force majeure* events.

The above definitions have been amended from those that applied in the first access arrangement period to exclude planned outages and single customer interruptions. These additional exclusions:

- provide a better measure of network performance; and
- result in the application of definitions that are consistent with the SCNRRR Normalised Unplanned methodology.

3.4.3 Service standard benchmarks: reference services for users connected to the distribution network

As discussed in Section 5, Part A of this document, Western Power's overall service performance objective is to target a modest but achievable improvement in reliability during the forthcoming access arrangement period. The proposed SAIDI service standard benchmarks shown in Table 66, and the SAIFI service standard benchmarks shown in Table 67 below:

Table 66: SAIDI service standard benchmarks (expressed as system minutes per annum)

SAIDI	SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2010	225	38	161	253	599
Year ending June 2011	210	38	150	233	567
Year ending June 2012	201	38	142	222	548

Table 67: SAIFI service standard benchmarks (expressed as supply interruptions per annum)

SAIFI	SWIN total	CBD	Urban	Rural Short	Rural Long
Year ending June 2010	2.44	0.24	1.88	3.05	4.89
Year ending June 2011	2.29	0.24	1.76	2.83	4.64
Year ending June 2012	2.18	0.24	1.67	2.70	4.47

In respect of *reference service* A9 ("Streetlighting Exit Service"), where Western Power is responsible for the repair of faulty streetlights, the service standard benchmarks shown in Table 68 will apply in relation to repair times for reported faults.

Table 68: Repair times for Streetlighting

	Second access arrangement period		
	Year ending June 2010	Year ending June 2011	Year ending June 2012
Perth Metropolitan area	5 days	5 days	5 days
Major regional towns	5 days	5 days	5 days
Remote and rural towns	9 days	9 days	9 days

3.5 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 document.

- *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.

- *Western Power's Extended Outage Payment Scheme.* Under this scheme 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 has a wide range of environmental and health and safety obligations that must be met[37]. 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 the company's service delivery commitments must be included in Western Power's expenditure plans.

3.6 Concluding comments

The proposed suite of service standard benchmarks for reference services build on the arrangements for the first access arrangement period. The information presented above demonstrates that the proposal satisfies the Code requirements.

The proposed service standard benchmarks are also commensurate with the company's expenditure programs for the forthcoming access arrangement period and the modest 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 (discussed in section 4 below) will, along with other measures proposed in the access arrangement, provide a clear discipline on the company to achieve its service performance targets.

[37] Section 5.4 of Part A provides an overview of Western Power's key compliance obligations.

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);
- the service standards adjustment mechanism (provided for in sections 6.30 to 6.32 of the Code); and
- a proposed "D factor" scheme.

Appendix 8 of Western Power's access arrangement provides further explanation of the proposed revenue cap arrangements, the associated correction factor, the investment adjustment mechanism and the D factor scheme set out in the access arrangement. It is intended that the explanatory notes provided in Appendix 8 of the access arrangement will assist in the interpretation of the price control arrangements set out in section 5 of the access arrangement should the need for such assistance arise.

4.2 Form of price control

4.2.1 Code provisions

Section 6.1 of the Code states:

> "Subject to section 6.3, an *access arrangement* may contain any form of *price control* provided it meets the objectives set out in section 6.4 and otherwise complies with this Chapter 6."

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)."

In relation to section 6.2(b), it is noted that *tariffs* is defined as:

"for a *covered service*, means the criteria that determine the *charge* that is payable by a *user* to the *service provider*."

4.2.2 Interpreting the Code provisions

In accordance with the requirements of section 6.3, the form of price control for Western Power's first access arrangement was established with reference to Western Power's approved total costs (i.e. section 6.2(a)). The basic form of control adopted was revenue capping, although the control also allowed for various adjustments to revenue, through mechanisms such as the Investment Adjustment Mechanism. The operation of these adjustment mechanisms provided an appropriate balance of risks and incentives for Western Power to achieve outcomes consistent with the Code objective.

For this and subsequent access arrangement periods, sections 6.1 and 6.2 of the Code provide that Western Power can propose *any* form of price control (providing that it meets the Code objective) that sets target revenue:

(a) by reference to the service provider's approved total costs; or

(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; or

(c) using a combination of the methods described in (a) and (b).

Target revenue is defined as the revenue to be earned by the service provider in respect of covered services, where covered services means reference and non-reference services. Section 6.2(b) therefore appears to contemplate a price control that applies to reference and non-reference services, where the control allows (at least some) tariffs to be increased according to changes in electricity industry costs and productivity.

It is important to note that the term "tariff" is not defined narrowly in the Code to mean a published price (as might be the ordinary meaning of the word), but instead it is defined more broadly as: "the criteria that determine the charge that is payable". As

noted above, section 6.2 of the Code allows all or part of Western Power's target revenue to be subject to the price control arrangements described in section 6.2(b).

In considering whether the form of control provided for by section 6.2(b) of the Code could be adopted for the forthcoming access arrangement period, it is noted that clause 5.1(b) of Western Power's access arrangement sets out the following criteria for determining charges for non-reference services:

> Charges for *non-reference services* will be:
>
> (i) negotiated in good faith;
>
> (ii) consistent with the *Code objective*; and
>
> (iii) reasonable

In light of the above discussion, it follows that:

- Section 6.1 of the Code enables Western Power to adopt any form of price control, providing that it satisfies the Code objective;
- Section 6.2 of the Code enables Western Power to adopt a price control based on either (a) cost of service; or (b) existing tariffs or charging criteria; or (c) a combination of (a) and (b); and
- Western Power's charging criteria for non-reference services in its access arrangement requires that the charges are: consistent with the Code objective; reasonable; and subject to good faith negotiations. It therefore appears that the method of control described in section 6.2(b) of the Code is appropriate to apply to non-reference services.

4.2.3 Designing the price control

In light of the Code provisions noted above, the first decision for Western Power to consider is whether the price control should based on a cost of service approach; existing tariffs or charging criteria; or a combination of the two.

Western Power's recent and planned expenditure indicates that the company continues to face unprecedented increases in both the required quantity of covered services and the costs of those covered services. Against this backdrop, the case for applying a price control to the whole of covered services based on tariffs or charging criteria is limited. This is because such price control methods are most appropriate in circumstances where the company's costs are in a "steady state".

However, setting a separate price control for non-reference services based on the charging criteria for non-reference services is more attractive for the following reasons:

- The charging criteria include provisions that the charges must be reasonable, negotiated in good faith and consistent with the Code objective. In effect, these charging criteria ensure that costs and revenues will be broadly matched, and that service levels will also be closely aligned with each customer's requirements.
- The current price control arrangement in which non-reference services are subject to revenue capping is less effective in meeting the Code objective. As

noted earlier, this is because the present arrangement exposes Western Power and its customers to possible windfall gains and losses if the actual costs of providing non-reference services are different to the forecast costs.

In summary, the Code objective would be better satisfied by a price control arrangement that better matches the costs and revenues for the provision of non-reference services. This would be best achieved by basing the price control on the charging criteria for non-reference services. A cost of service form of control would continue to apply to reference services in the same way as current practice.

The effect of this approach would be to remove the costs and revenues associated with the provision of non-reference services from the cost of service based price control that applies to reference services. It is worth noting that such an approach is in accordance with good regulatory practice adopted in other jurisdictions, where non-reference services are typically referred to as "excluded services."[38] As noted in section 4.2.1, the Code is sufficiently flexible (or can be interpreted sufficiently broadly) in relation to the price control provisions to enable the company to adopt such an approach in respect of the access arrangement period.

Western Power notes the requirements in section 4.1 of the Authority's *Guidelines for the Access Arrangement Information* to provide information on cost projections and productivity growth if a price control is proposed in accordance with section 6.2(b)(ii) of the Code. It is difficult, however, to estimate how the costs of non-reference services will increase over the forthcoming access arrangement period, given that the scope of non-reference services is determined to some extent by customers. The detailed escalation factors provided by Access Economics (contained in Appendix 2 of this document), however, are nevertheless relevant to the future costs of non-reference services. At this stage Western Power believes that these input cost increases will only be partly offset by productivity improvements. Overall, therefore, Western Power believes that the costs of non-reference services will tend to increase faster than the CPI over the forthcoming access arrangement period.

In relation to the cost of service control that would apply to reference services, it is noted that there are three basic forms of price control. These are:

1. a "tariff basket" (or weighted price cap);

2. a pure revenue cap; and

3. a revenue yield control.[39]

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 networks are presently subject to a revenue cap;

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38 For example, ESCOSA, 2005-2010 Electricity Distribution Price Review, Statement of Reasons, April 2005, section 2.5.7.

39 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.

- ActewAGL is currently subject to an average revenue yield form of control;

- electricity distributors in Victoria and NSW are presently subject to a "tariff basket" form of control;

- electricity distribution price controls for 2005 to 2010 in South Australia apply an average revenue yield form of control; and

- electricity transmission companies that are regulated by the AER under the National Electricity Rules are subject to a revenue cap form of control.

Over recent years, there has been a good deal written about the merits of different forms of price controls.[40] 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.

In its August 2005 access arrangement submission, Western Power initially proposed that a revenue yield form of control should apply to the transmission and distribution businesses. The Authority's Draft Decision required Western Power to adopt a revenue cap.

In responding to the Authority's required amendments in the Draft Decision[41], Western Power noted that it did not accept some of the Authority's reasoning for its decision. However, Western Power accepted the Authority's Draft Decision that a revenue cap should be adopted. Western Power's first access arrangement therefore includes a revenue cap for the transmission and distribution networks.

Western Power has considered carefully whether it should continue to adopt a revenue cap control or, alternatively, adopt either a revenue yield or tariff basket. A key consideration is that a revenue cap form of control may not provide Western Power with protection against cost increases that result from (unexpectedly high) sales growth, nor does it provide any incentive to grow the business. Whilst the Investment Adjustment Mechanism may protect Western Power against the financial consequences of additional capital expenditure, no such mechanism applies in relation to operating expenditure.

Western Power's recent experience indicates that there are numerous and varied sources of increases in operating expenditure, quite apart from unexpected sales growth. For example, the following factors may create operating expenditure risk for Western Power:

- changes in material costs (including base metal prices or equipment costs);

- changes in labour costs (including internal and contractor costs);

- estimating errors in the work programme, including the scope for network support services;

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40 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.

41 Western Power, Response to the Required Amendments, May 2006.

- uncertainty regarding the scope and future costs of efficient demand-side initiatives;

- changes in technical standards; and

- errors in project cost estimation.

Compared to errors in forecast sales growth, Western Power's analysis indicates that the above factors are likely to be much more significant in their impact on operating expenditure.

On this basis, Western Power believes that it is appropriate to maintain the existing form of control, being revenue cap, and to address the operating expenditure risk identified by:

- improving Western Power's estimation processes, which have been described in Parts B and C of this access arrangement information;

- continuing to make effective use of the Code provisions in relation to the recovery of cost increases associated with force majeure events, as discussed later in this Part D; and

- proposing a new D-factor scheme to provide Western Power with an opportunity to recover the efficient costs of network support and demand-side initiatives, which is also discussed later in this section.

As noted in Parts B and C of this document, to manage the price increases in this access arrangement period, Western Power has deferred the recovery of $177.3 million ($ real as at 30 June 2009) for the distribution network and $14.6 million ($ real as at 30 June 2009) for the transmission network, until the start of the third access arrangement period. The amounts of $177.3 million and $14.6 million should be added to the target revenue in the third access arrangement period. The amounts have been calculated to include the time value of money, assuming that the amount is recovered at the start of the third access arrangement period. The deferral of revenue in this way is an extraordinary step which aims to further manage the price impacts on customers in the forthcoming access arrangement period.

4.3 Cost impacts of unforeseen events

4.3.1 Code provisions

Sections 6.6 to 6.8 of the Code allow Western Power, in certain circumstances, 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.

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:

- 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; and/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.

For the forthcoming access arrangement period, Western Power proposes to continue to rely on the Code provisions relating to unforeseen events to recover these costs. 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 manage all of its risk exposures efficiently and proactively.

The proposed provisions are substantially unchanged from the first access arrangement period, with the only change being the addition of the following provision:

> "For the avoidance of doubt, a *force majeure event* includes but is not limited to any costs arising from the introduction of an emissions trading scheme; full retail contestability; and the roll-out of Advanced Interval Meters to the extent that such costs were not included in the calculation of *target revenue* for the *access arrangement period* or otherwise addressed through the Trigger Event provisions in section 8 of this access arrangement."

The above provision makes it clear that the introduction of an emissions trading scheme; full retail contestability; or the roll-out of Advanced Interval Meters could be matters that lead to unexpected, significant cost increases in the forthcoming access arrangement period. The above provision also recognises that the cost impact could alternatively be addressed as a Trigger Event, which would involve a re-opening of the revenue control. Western Power envisages that a Trigger Event would be more appropriate if the change had a major impact on Western Power from an operational and cost perspective.

For further details of Western Power's proposed approach to unforeseen costs please refer to Section 5 of the access arrangement. The arrangements for Trigger Events are set out in section 10 of this Part D.

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 technical rule 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

Western Power's proposed capital and operating expenditure for the forthcoming access arrangement period reflects the costs associated with meeting the requirements for asset and system performance under the technical rules that are expected to be in effect at the time of the Authority's approval of the access arrangement.

If the technical rules are amended over the course of the forthcoming access arrangement period, then Western Power will, as part of its proposed access arrangement for the next access arrangement period, provide a report to the Authority setting out:

(a) a description of the nature and timing of the impact of the technical rule change on Western Power's operating and capital costs for the first access arrangement period; and

(b) a fair and reasonable estimate of the additional costs (or cost savings) accruing to Western Power as a result of that technical rule change.

The Authority will then determine an adjustment to Western Power's target revenue for the third access arrangement period, to compensate for any change in costs during the forthcoming access arrangement period, in accordance with the provisions contained in sections 6.9 to 6.12 of the Code.

For further details of Western Power's proposed approach please refer to Section 5 of this document and Appendix 8 of the access arrangement. It is noted that this provision is unchanged from the first access arrangement period.

4.5 Investment adjustment mechanism and capital contributions adjustment mechanism

4.5.1 Code provisions and other relevant considerations

Section 6.13 defines investment adjustment mechanism (IAM) 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
>
> (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*."

Section 6.18 of the Code states:

> "An *investment adjustment mechanism* in an *access arrangement* applies at the next *access arrangement review*."

4.5.2 Western Power's proposed approach

Western Power's proposed approach to the IAM is unchanged from the first access arrangement period. In particular, Western Power's view is that an effective price control arrangement should:

- 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 investment.

There is, however, a trade-off between providing incentives for efficiency on the one hand, and certainty of cost recovery on the other. In essence, the design of the IAM should appropriately balance this trade-off.

Western Power's current access arrangement includes an IAM and a capital contributions adjustment mechanism, that:

- adjust Western Power's target revenue in the forthcoming (and subsequent) access arrangement periods in a manner that leaves Western Power economically neutral as a result of any differences between actual and forecast

transmission and distribution capital expenditure and capital contributions in each year of the first access arrangement period, with the exception that:

- the investment adjustment mechanism will not have regard to any differences between actual and forecast capital expenditure with respect to the refurbishment or renewal of the distribution or transmission network; or information technology assets in the first access arrangement period.

Western Power proposes to continue to apply the same investment adjustment mechanism in the forthcoming access arrangement period. The rationale for this approach is that uncertainties regarding Western Power's future capital expenditure continue to be significant.

However, Western Power is proposing to discontinue its current approach to capital contributions. In particular, following a report from economic consultants NERA, Western Power proposes to discontinue the application of the so-called Queensland method for capital contributions. The Queensland Method treated the capital contribution as revenue in the year in which it was received, whilst the costs are amortised over the life of the asset. The effect of the Queensland Method is therefore to reduce revenue requirements from network tariffs today, but to require higher network tariffs in the future to compensate.

Instead, Western Power is proposing to apply the conventional method for the treatment of capital contributions for the forthcoming access arrangement period. Under this approach, the costs and revenues associated with assets funded via capital contributions are excluded from the target revenue building block calculations, and the revenue cap. The price control arrangements for the forthcoming access arrangement period (as described in this section 4) therefore obviate the need for a capital contributions adjustment mechanism. This is because under the proposed revisions to the access arrangement, the price control revenue is unaffected if forecast errors occur in relation to capital contributions. Therefore, whilst the adjustments necessary to give effect to the capital contributions adjustment mechanism from the first access arrangement will apply, the capital contributions adjustment mechanism itself will not apply in future access arrangement periods. These matters are discussed in more detail in Appendix 8 of the access arrangement.

It also should be noted that Western Power does not believe that the Code provisions relating to the New Facilities Investment Test necessitate after-the-event reviews of capital expenditure. In accordance with the approach adopted by the Essential Services Commission in Victoria in applying the National Gas Code (which contains provisions that are identical to the New Facilities Investment Test), Western Power believes that strong financial incentives to minimise capital expenditure would obviate the need for the Authority to conduct an after-the-event "prudency" review.

In this context, Western Power notes that in the medium term it would prefer that a more narrowly-defined IAM be applied, as this would provide stronger incentives on the company to minimise capital expenditure. Western Power will be working with the Authority during the forthcoming access arrangement period to ensure that future after-the-event prudency reviews will be scoped to match the coverage of the IAM. If Code changes are required to achieve this outcome, Western Power will work with the Authority and other stakeholders accordingly.

Further details of the operation of the IAM are provided in section 5 of the access arrangement.

4.6 Gain sharing mechanism and efficiency and innovation benchmarks

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's current access arrangement does not contain a gain sharing mechanism. In proposing this outcome, Western Power noted that the design and implementation of such mechanisms is not a straightforward matter and, arguably, developing and implementing a gain sharing mechanism at the time could inappropriately divert management resources away from service delivery imperatives. Nevertheless, Western Power acknowledged the important role that such incentive mechanisms have to play in fostering efficient behaviour within established regulatory regimes.

For this forthcoming access arrangement period, therefore, Western Power proposes to adopt a gain sharing mechanism in accordance with the Code. Western Power notes that the Code provisions in this area are novel and somewhat complex. In brief, the gain sharing mechanism is defined as follows:

- The Code defines a surplus (section 6.23), from which an above benchmark surplus must be derived (section 6.27).

- The above benchmark surplus identifies how much (if any) of the surplus results from efficiency gains or innovation by the service provider (section 6.27).

- The above benchmark surplus is calculated with respect to efficiency and innovation benchmarks (section 6.25) which must provide an objective standard

for assessing the service provider's efficiency and innovation during the access arrangement period (section 5.26(b)).

- An above-benchmark surplus does not exist to the extent that a service provider achieved efficiency gains or innovation in excess of the efficiency and innovation benchmarks during the previous access arrangement period by failing to comply with service standard benchmarks (section 6.26).

In view of the Code requirements, Western Power's proposed gain sharing mechanism has the following features:

- The gain sharing mechanism only applies to operating expenditure, not capital expenditure.

- The above benchmark surplus is measured in aggregate over a whole access arrangement period, and is defined as the difference between the sum of the Authority's forecast annual operating expenditures (which is the efficiency and innovation benchmark) and the sum of Western Power's actual operating expenditure over the access arrangement period. The above benchmark surplus cannot be negative.

- An adjustment is made to the Authority's forecast operating expenditure to include the effects of inflation and any additional amount allowed by virtue of a trigger event, unforeseen event or technical rule change. This ensures that comparisons between aggregate actual and forecast operating expenditure are made on a like-for-like basis.

- The above benchmark surplus is subject to a further adjustment to ensure that Western Power does not receive any efficiency gain reward in respect of operating expenditure reductions that have occurred at the expense of service levels.

- The amount to be added to target revenue in the next and subsequent access arrangement periods will be the average annual above benchmark surplus. This amount will be added to target revenue for a total of five years immediately after the last year of the access arrangement period in which the relevant efficiency gains were achieved.

- The use of an average annual efficiency gain in the calculation addresses any regulatory concern that Western Power might engage in strategic cost shifting within the access arrangement period.

- The gain sharing mechanism provides an equitable sharing of the calculated efficiency gains between Western Power and its customers, in accordance with the requirements of the Code.

A worked example is presented in Table 69 below for illustrative purposes only.

Table 69: Illustration of proposed gain sharing mechanism

	2nd AA period				3rd AA period			4th AA period		
	1	**2**	**3**	**Total**	**4**	**5**	**6**	**7**	**8**	**9**
Authority's unadjusted O&M Forecast	100	100	100	300						
Adjustments for inflation and any additional allowance for trigger events	10	12	14	36						
Efficiency and innovation benchmark	**110**	**112**	**114**	336						
Western Power's actual O&M expenditure	103	113	104	320						
Above benchmark surplus *(Can be negative in any one year, but not in total)*	**7**	**-1**	**10**	**16**						
Adjustment for any SSAM penalty	-2	0	0	-2						
Efficiency gain attributed to management effort	5	-1	**10**	14						
Average annual efficiency gain				4.7						
Average annual actual opex over AA#2				**106.7**						
5 year carry over of annual average efficiency gains from AA#2					4.7	4.7	4.7	4.7	4.7	
Amount to be added to target revenue in next and subsequent AA					**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	

Western Power strongly believes that the introduction of a gain sharing mechanism is consistent with the furtherance of the Code objective. In particular, it provides a sharper incentive on Western Power to achieve operating expenditure efficiencies, which will ultimately benefit customers.

Further details of the operation of the gain sharing mechanism are provided in section 5 of the access arrangement.

4.7 Service standards adjustment mechanism

4.7.1 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*.

4.7.2 Principles guiding the design of the mechanism

Western Power's view is that the service standard adjustment mechanism (SSAM) should be designed:

- 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 regulatory regime.

Ideally, Western Power believes that the following matters should be considered in developing the operational features of SSAM:

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 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 broadly 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 regulators in other jurisdictions. It is noted, however, that these principles can only provide a broad guide to the design of the SSAM.

4.7.3 Developing the service standard adjustment mechanism

A key factor for the forthcoming access arrangement period is that Western Power's proposed expenditure plans are significantly affected by resourcing issues. Consequently, as explained in section 5 of Part A of this document, Western Power is planning to deliver relatively modest improvements in service performance. The limited scope to improve performance beyond the target levels also needs to be taken into account in designing the SSAM. In these circumstances the function of the SSAM is to provide a means of ensuring that Western Power makes a tangible financial commitment to delivering the target level of performance, as opposed to driving further service improvements.

With these factors in mind, Western Power is proposing a modest scheme that places ½% of revenue at risk. A SSAM will apply to the transmission and distribution networks. For illustrative purposes, ½% of reference service revenues for 2009/10 equates to revenue at risk of $2.7 million and $4.6 million for the transmission and distribution networks respectively. It is noted that the SSAM for the forthcoming access arrangement period will not be based on the value that customers attribute to reliability improvements, but the scheme may be enhanced in this regard in future access arrangement periods. It is noted that the proposed SSAM is similar to the types of schemes that were initially adopted in other jurisdictions (and continue to be applied in several instances).

A dead-band sets a performance tolerance around the service standard benchmarks 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. A dead-band is determined with reference to historic data.

As explained in section 3 of this Part D, Western Power is proposing the following service performance measures for the transmission network:

- Circuit Availability, and

- System Minutes Interrupted (for meshed circuits and radial circuits).

The SSAM for the transmission network will apply to these measures of performance as follows:

- It is considered that the two performance indicators are of similar significance and should be weighted equally in the SSAM. Therefore the revenue at risk shall be allocated 50:50 to Circuit Availability and System Minutes Interrupted.

- The revenue at risk for System Minutes Interrupted shall be allocated for meshed and radial networks based on the numbers of customers connected to each type of network.

- The lower boundary of the dead-band for Circuit Availability is set at 0.5% less than the service standard benchmark (which in turn, is based on historical average performance).

- The limits of the dead-band for System Minutes Interrupted correspond to the lowest and highest performance reasonably expected, based on recent history.

As explained in Section 3 of this Part D, Western Power has proposed SAIDI and SAIFI performance measures for reference services for users connected to the distribution network, for the following categories:

- CBD;

- Urban;

- Rural Short;

- Rural Long; and

- SWIN total.

For the forthcoming access arrangement period, Western Power proposes the following allocation of revenue at risk:

- Allocation between SAIDI and SAIFI is on a 2/3 and 1/3 basis, respectively.

- Allocation of the distribution revenue at risk between the Urban and Rural categories reflects the respective customer numbers in each category.

- Equal incentives and penalties should apply for CBD and Urban; and Rural Short and Rural Long categories.

- The total SWIN SAIDI and SAIFI indicators will not feature in the SSAM.

- The limits at which a full reward or penalty would be applied are set at a further 10% above and below the dead-band limits.

The SSAM is set out sections 5.24A and 5.24B of the access arrangement.

4.8 D Factor Scheme

This access arrangement information has explained that Western Power is focused on further developing its role as an energy solutions business. In this regard, Western Power believes that a D factor scheme should form part of the revenue cap. The purpose of the D factor scheme is to allow Western Power to recover the efficient costs incurred in undertaking demand management initiatives and in providing network support.

The rationale for a D factor scheme arises from the following observations:

1. Western Power's proposed expenditure for the forthcoming access arrangement period in pursuing further development as an energy solutions business is uncertain. In particular:

    - Smart grid developments depend on the roll-out of advanced interval meters, which in turn is uncertain in terms of scope and timing;

    - Technological developments are difficult to anticipate; and

    - Business cases for a number of specific initiatives or pilot schemes will be developed and costed during the forthcoming access arrangement period (and cannot be known with certainty in time for inclusion in the proposed revisions for the forthcoming access arrangement period).

2. A broadly defined Investment Adjustment Mechanism (IAM) adjusts future revenue so that Western Power is financially neutral if actual capital expenditure (excluding replacement and IT capital expenditure) is higher or lower than forecast. A similar adjustment mechanism does not apply to operating expenditure. It follows from these regulatory arrangements that Western Power will be financially disadvantaged if it incurs additional operating expenditure during an access arrangement period in order to efficiently defer or avoid capital expenditure.

3. From an environmental perspective, Western Power should have a regulatory incentive to encourage the company to further develop as an energy solutions business for a sustainable future. Western Power is aware that the electricity and gas market regulator in the UK, Ofgem, has introduced an incentive mechanism that remunerates electricity distribution companies at a rate of £2 per kW for each kW of new connection capacity provided to distributed generation. It may be appropriate to consider a similar arrangement for Western Power at some future date.

4. Western Power is aware that the Australian Energy Regulator (AER) has developed a D-factor incentive scheme in accordance with the requirements of the National Electricity Rules. However, the AER's D-Factor scheme provides weak incentives to undertake demand management initiatives and the detailed review of projects by the regulator under that scheme is considered unnecessarily detailed and intrusive. In particular, Western Power's view is that the AER's scheme would be inconsistent with the Code objective.

Western Power therefore proposes that a D factor scheme applies in the forthcoming access arrangement period, with the following features:

- It applies to both transmission and distribution expenditure.

- It provides for the recovery in the third access arrangement period of:

    - any additional operating expenditure incurred by Western Power as a result of deferring or avoiding a capital expenditure project during the forthcoming access arrangement period; and

    - any additional operating or capital expenditure incurred by Western Power in the forthcoming access arrangement period in relation to demand management initiatives.

The recovery of costs should be subject to a test for efficiency and prudency. Given the importance of promoting a broader approach to energy solutions (consistent with the Code objective), Western Power believes that a relatively low cost approach should be applied to scrutinising the expenditure incurred. Therefore, Western Power proposes that costs are only recoverable if there is an approved business case for the relevant expenditure, and this business case is made available to the Authority.

Further details of the D factor scheme are provided in section 5 of the access arrangement.

5 Pricing methods

5.1 Introduction and background

In accordance with the requirements of section 4.3 (b) of the Code this section of the access arrangement information sets out information detailing and supporting the pricing methods in the access arrangement.

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 price 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[42].

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 the side constraint each year and, over time, consumers on the transition tariffs have migrated to the reference tariffs as these become more cost-effective. As noted in section 2.3 of this Part D, Western Power now intends to remove the transition tariffs for the forthcoming access arrangement and to transfer the remaining customers to reference tariffs.

[42] 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.

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 description of Western Power's pricing methods in this section sets out the kind of explanatory information that is contemplated by chapter 7 of the Code.

A complicating factor for the forthcoming access arrangement period is that (as noted earlier in this document) Western Power has deferred the recovery of some revenue to the third or subsequent access arrangement periods. To give effect to this deferral, the reference tariffs for 2007/08 have been scaled to recover the appropriate amount of revenue from reference services. The effect of this scaling is to preserve the cost allocations that were established in the first access arrangement period. In accordance with the Code requirements, the price list information provided as Appendix 6 to the access arrangement explains the pricing method that underpinned the development of these tariff prices in 2007/08, which, in turn, forms the basis of the reference tariffs for the forthcoming access arrangement period.

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;
- section 5.4 outlines the principles applied by the company to guide the development of its pricing methods and the design of network tariffs;
- section 5.5 sets out information demonstrating that Western Power's pricing methods comply with the relevant Code provisions;
- section 5.6 sets out Western Power's policy relating to prudent discounting; and
- section 5.7 sets out Western Power's policy relating to discounts for distributed generation.

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 transfer 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.

Section 7.12 requires that the tariff equalisation contribution must: be included in the reference tariffs for distribution network users; be equitable in its effect as between those users; and otherwise be consistent with the Code objective.

5.3 Western Power's network pricing objectives

In accordance with section 7.3 (a) of the Code, reference tariffs are designed to recover forward-looking costs of providing reference services. It is recognised that the total forward-looking costs for the provision of covered services relate to the provision of reference and non-reference services.

Non-reference service revenue is recovered on a fee-for-service basis and reflects that component of the forecast costs related to the provision of non-reference services.

Capital contributions are charged in accordance with Western Power's contributions policy. In general terms, capital contributions seek to recover in net present value terms any shortfall between the expected revenue from reference tariffs and the costs of connection.

Western Power's reference tariffs are 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).

As described in the access arrangement information for the first access arrangement period, Western Power's objectives in setting tariffs are consistent with the Code requirements. Those objectives are:

- 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 costs of providing reference services 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 reference service 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.[43] As noted in section 5.1, further information is provided in the Price List Information, Appendix 6 to the access arrangement.

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 in Table 70 below.

Table 70: Western Power's Reference Services

Reference tariffs for users connected to the distribution network	RT1	Anytime energy residential
	RT2	Anytime energy business
	RT3	Time of use energy residential
	RT4	Time of use energy business
	RT5	High voltage (HV) metered demand
	RT6	Low voltage (LV) metered demand
	RT7	HV Contract maximum demand (HV CMD)
	RT8	LV Contract maximum demand (LV CMD)
	RT9	Street lights
	RT10	Unmetered supplies
	RT11	Distribution connected generation tariffs
Transmission-reference tariffs	TRT1	Transmission nodal tariff (loads)
	TRT2	Transmission nodal tariff (generators)

The following sections discuss the Code requirements regarding pricing objectives and the structure of tariffs.

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

[43] 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.

component, while reference tariffs RT1 to RT11 also contain a distribution network tariff component.

As noted in Parts B and C of this document, 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 through reference tariffs.

Reference tariffs are designed to recover the costs of providing reference services in each year, based on forecast energy volumes. However, 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 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[44] and tariffs ensure 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. As noted in section 5.1, further information is provided in the Price List Information, Appendix 6 to the access arrangement.

5.5.3 Reference tariffs should be between incremental and stand-alone cost

In accordance with sections 7.3 (b)(i) and (ii) of the Code, reference tariffs are set to at least recover the incremental cost, but to be less than the stand-alone cost of service provision. Western Power understands that these Code provisions are intended to ensure that reference tariffs are set to be cost-reflective, and to avoid cross subsidies within reference tariffs, and between reference tariffs. Further information regarding Western Power's compliance with this provision is provided in the Price List Information, which is included as Appendix 6 to the access arrangement.

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.

[44] As explained in section 8 of Part B and section 7 of Part C of this document, Western Power's target revenue is determined in accordance with section 6.4(a)(i) of the Code.

For transmission, location specific prices are derived for each electrical node. 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.

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. Western Power notes that its consideration of this issue is unchanged from the first access arrangement period.

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:

- the forecast tariff revenue has been smoothed across the access arrangement period so that transmission and distribution reference tariff price movements will be smoothed across each year of the access arrangement period, and

- side constraints apply on all tariff component adjustments to limit annual price movements.[45]

On this basis, Western Power considers that the requirements of section 7.4(c) of the Code are met. Western Power notes that its consideration of this issue is unchanged from the first access arrangement period.

5.5.7 Management 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 managed by the measures described below.

- As noted earlier in this submission, Western Power has deferred the recovery of some revenue for the transmission and distribution networks until the third (or subsequent) access arrangement period(s). The deferral of revenue in this way is an extraordinary step which aims to manage the customer impacts of price increases in the forthcoming access arrangement period.

- In accordance with section 7.4(d) of the Code, the structure of reference tariffs is designed to minimise tariff rebalancing, principally by the imposition of side constraints on annual price movements for each tariff. In addition, as already

[45] Further details of the price control are set out in section 4 of this Part D.

noted in section 5.5.6, the forecast reference service revenue has been smoothed across the access arrangement period, having regard to the likely price levels at the start of the third access arrangement period. The revenue smoothing process only affects the profile of price movements, and does not impact the total revenue in present value terms over the access arrangement period.

In light of the above comments, 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 tariffs have been designed to recover the cost of service provision in a cost reflective manner. Section 7.6 of the Code requires the incremental cost of service provision to be recovered by tariff components that vary with usage, and the costs in excess of the incremental costs to be recovered through tariff components that do not vary with usage.

This requirement has been achieved through the method described in the Price List Information (contained in Appendix 6 of the access arrangement), in which, subject to section 7.7 of the Code price components have been derived to recover the cost of service provision using a cost reflective approach consistent with the requirements of sections 7.3 and 7.4 of the Code.

On the basis described in the Price List Information, usage related charges reflect the incremental costs to Western Power of providing reference services, and tariff components that do not vary with usage reflect the costs in excess of the incremental costs of service provision.

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 SWIN, irrespective of location. On this basis, Western Power considers that the requirements of section 7.7 of the Code are satisfied. This approach is unchanged from the first access arrangement period.

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

This policy is unchanged from the first access arrangement period.

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; and

- 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.

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

This policy is unchanged from the first access arrangement period.

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.

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. The applicable sections of the Code include proposed Electricity Networks Access Code Amendments (No 2) 2008.

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 any *required work* needs to be undertaken in order for the *service provider* to provide the *covered services* sought:

      A. operational and technical details of the *required work*; and

      B. commercial information regarding the likely cost of the *required work*; 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 document is structured as follows:

- section 6.2 cites the remaining Code provisions in relation to the applications and queuing policy; and
- section 6.3 explains Western Power's proposed amendments to its current applications and queuing policy, which has been approved by the Authority.

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.

5.9A If:

(a) an *access application* (the **"first application"**) seeks modifications to any *contract for services*; and

(b) the modifications, if implemented, would not materially impede the *service provider's* ability to provide a *covered service* sought in one or more other *access applications* (each an **"other application"**) compared with what the position would be if the modifications were not implemented,

then the *first application* is not, by reason only of seeking the modifications, a *competing application* with the *other applications*.

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*."

For the current access arrangement period, Western Power made a number of modifications to the *model applications and queuing policy*, which were approved by the Authority. In section 6.3 below, Western Power explains the rationale for further changes to the approved policy in accordance with the Code requirements.

6.3 Proposed revisions to the current approved applications and queuing policy

In accordance with the Code provisions described in this section, Western Power proposes a number of revisions to the current applications and queuing policy

approved by the Authority on 26 April 2007[46]. An explanation of these proposed revisions is provided in Appendix 10 of this document.

[46] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007.

7 Contributions policy

7.1 Introduction

Section 5.1(h) of the Code states that an access arrangement must include a contributions policy under sections 5.12 to 5.17D. The applicable sections of the Code – cited below - include proposed Electricity Networks Access Code Amendments (No 2) 2008.

Broadly speaking, the contributions policy applies where it is necessary for Western Power to undertake *required work*, or 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 contribution policy describes the circumstances in which a *contribution* will be payable by the *applicant* and the method for calculating the *contribution*.

The remainder of this section is structured as follows:

- section 7.2 cites the Code provisions in relation to the contributions policy; and
- section 7.3 explains Western Power's proposed amendments to its current capital contributions policy, which has been approved by the Authority.

7.2 Code provisions

This section provides details of the relevant Code provisions in relation to the contributions policy.

"5.12 The objectives for a *contributions policy* must be that:

(a) it strikes a balance between the interests of:

i. *contributing users*; and

ii. other *users*; and

iii. *consumers*;

and

(b) it does not constitute an inappropriate barrier to entry.

5.13 A *contributions policy* must facilitate the operation of this Code, including:

(a) sections 2.10 to 2.12; and

(b) the *new facilities investment test*; and

(ba) sections 5.14 and 5.17D; and

(c) the *regulatory test*.

5.14 Subject to section 5.17A and *a headworks scheme*, a *contributions policy*:

(a) must not require a *user* to make a *contribution* in respect of any part of *new facilities investment* which meets the *new facilities investment test*; and

(b) must not require a *user* to make a *contribution* in respect of any part of *non-capital costs* which would not be incurred by a *service provider efficiently minimising costs*; and

(c) may only require a *user* to make a *contribution* in respect of *required work*; and

(d) without limiting sections 5.14(a) and 5.14(b), must have the objective that there be no double recovery of *new facilities investment* or *non-capital costs*.

5.15 A *contributions policy* must set out:

(a) the circumstances in which a *contributing user* may be required to make a *contribution*; and

(b) the method for calculating any *contribution* a *contributing user* may be required to make; and

(c) for any *contribution*:

i. the terms on which a *contributing user* must make the *contribution*; or

ii. a description of how the terms on which a *contributing user* must make the *contribution* are to be determined.

5.16 A *contributions policy* may:

(a) be based in whole or in part upon the *model contributions policy*, in which case, to the extent that it is based on the *model contributions policy*, any matter which in the *model 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 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 contributions policy* and is not required to reproduce, in whole or in part, the *model contributions policy*.

5.17 The *Authority*:

(a) must determine that a *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 contributions policy*; and

(b) otherwise must have regard to the *model contributions policy* in determining whether the *contributions policy* is consistent with sections 5.12 to 5.15 and the *Code objective*."

5.17A Despite section 5.14, Electricity Networks Corporation may require a *contribution* for *Appendix 8 work* of up to the maximum amount determined under Appendix 8 for the relevant type of *Appendix 8 work.*

5.17B From 1 July 2007 until the first *revisions commencement date* for the *Western Power Network access arrangement*, section 5.17A prevails over any inconsistent provision of the *Western Power Network access arrangement*.

5.17C Despite section 5.14, the ERA may approve a *contributions policy* that includes a **"headworks scheme"** which requires a *user* to pay a *charge* to the *service provider* in respect of the *user's* capacity at a *connection point* on a *distribution system* because the *user* is a member of a class, whether or not there is any *required work* in respect of the *user.*

{Example: In 2008 Electricity Networks Corporation adopted a headworks scheme under which new users in certain rural parts of the SWIS who connect more than 25 km along the wires from a zone substation, were required to pay a headworks charge in respect of reinforcement of the 3 phase HV distribution network, whether or not the user's connection made any such reinforcement necessary.}

5.17D A *headworks scheme* must:

(a) identify the class of *works* in respect of which the scheme applies, which must not include any *works* on a *transmission system* or any *works* which effect a geographic extension of a *network*; and

(b) not seek to recover *headworks charges* in an *access arrangement period* which in aggregate exceed [1]% of the target revenue for the *distribution system* for the *access arrangement* period; and

(c) identify the class of *users* who must pay a charge under the scheme; and

(d) set out the method for calculating the *headworks charge,* which method:

(i) must have the objective that *headworks charges* under the *headworks scheme* will, in the long term, and when applied across all relevant *users*, recover no more than the *service provider's* costs (such as would be incurred by a *service provider efficiently minimising costs*) of any *headworks*; and

(ii) must have the objective that the *headworks charge* payable by one *user* should differ from that payable by another *user* as a result of material differences in the users' capacities and the locations of their *connection points*, unless the *Authority* considers that a different approach would better achieve the *Code objective*; and

(iii) may use estimates and forecasts (including long term estimates and forecasts) of loads and costs; and

(iv) must have the objective that, in the long term, there be no double recovery of *costs* in all the circumstances, including the manner of calculation of other *contributions* and *tariffs*; and

(v) may exclude a rebate mechanism (of the type contemplated by clauses A4.13(d) or A4.14(c)(ii) of Appendix 4) and may exclude a mechanism for retrospective adjustments to account for the difference between forecast and actual values.

For the current access arrangement period, Western Power made a number of relatively minor but important modifications to the model capital contributions policy. In section 7.3 below, Western Power explains the rationale for further changes to the approved policy in accordance with the Code requirements.

7.3 Proposed revisions to the current approved capital contributions policy

In accordance with the Code provisions described in this section, Western Power proposes a number of revisions to the current capital contributions policy approved by the Authority on 26 April 2007[47]. An explanation of these proposed revisions is provided in Appendix 11 of this document.

[47] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007.

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. The remainder of this section is structured as follows:

- section 8.2 cites the Code provisions in relation to the *standard access contract*; and
- section 8.3 explains that Western Power's amendments to the standard access contract set out in the Code.

8.2 Code provisions

This section cites the relevant Code provisions relating to the 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*."

For the current access arrangement period, Western Power made a number of modifications to the standard access contract. In section 8.3 below, Western Power explains the rationale for further changes to the approved policy in accordance with the Code requirements.

8.3 Proposed revisions to the current approved standard access contract

In accordance with the Code provisions described in this section, Western Power proposes a number of revisions to the current standard access contract approved by the Authority on 26 April 2007[48]. An explanation of these proposed revisions is provided in Appendix 12 of this document.

[48] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007.

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. The remainder of this section is structured as follows:

- section 9.2 cites the Code provisions in relation to the *transfer and relocation policy*; and
- section 9.3 explains Western Power's proposed changes to the *transfer and relocation policy* noting the policy's compliance with the relevant provisions in the Code.

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."

The Authority approved Western Power's transfer and relocation policy for the first access arrangement period as being consistent with the requirements of sections 5.18 to 5.24 of the Code and the Code objective. Section 9.3 below explains the rationale for changes to the approved policy for the forthcoming access arrangement period.

9.3 Proposed revisions to the current approved transfer and relocation policy

In accordance with the Code provisions described in this section, Western Power proposes a number of revisions to the current transfer and relocation policy approved by the Authority on 26 April 2007[49].

The proposed revisions address the following matters:

- the definition of 'network' now picks up the new definition for 'Western Power Network' proposed for the Code;
- the definition of 'contracted capacity' has been amended to make it consistent with the definition for that term used in the other polices;
- the interpretation section has been deleted and replaced with the interpretation provisions used in the other policies, so that the transfer and relocation policy is consistent with the other polices; and
- the definitions of 'contribution' and 'contributions policy' have been deleted as they were not referred to in any of the clauses of the transfer and relocation policy.

[49] ERA, Further Final Decision on the Proposed Access Arrangement for the South West Interconnected Network, 26 April 2007.

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 Proposed revisions to trigger events

In considering how Western Power might define trigger events for the forthcoming access arrangement period, it is important to consider how the Code addresses other aspects of risk and uncertainty. In particular, the Code also provides for the recovery of costs arising from:

- unforeseen events (in section 6.6)
- technical rule changes (section 6.9); and
- the investment adjustment mechanism, which corrects for differences between forecast and actual capital expenditure in particular expenditure categories (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 duplicate cost recovery that might be achieved through the mechanisms covering unforeseen events; technical rule changes; and investment adjustments.

As noted in respect of the Unforeseen Events provisions (in section 4.3 of this Part D), it is important to recognise the potentially significant impact that the introduction of an emissions trading scheme; full retail contestability; or the roll-out of Advanced Interval Meters may have on Western Power's future expenditure. Without knowing the scope and impact of these potential changes, it is impractical to decide at this stage whether the cost impacts should be addressed through the Unforeseen Events or Trigger Events provisions. To address this issue, the access arrangement has been amended to provide an option for these matters to be addressed through either provision.

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).

The relevant drafting change to give effect to Western Power's proposal is set out in section 8 of the access arrangement for the forthcoming access arrangement period.

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 Proposed revisions to supplementary matters

Western Power is not proposing any revisions to the supplementary matters provisions set out in the first access arrangement.

Appendices