ASSESSMENT OF AA1 CAPEX – NFIT SUBMISSION

Prepared for

***PB** Quality System:*

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NOMENCLATURE

Table 1-1 defines the abbreviations and nomenclature used in this report.

Throughout the report, text in *italics* denotes direct quotes from either Western Power documents or the Electricity Networks Access Code 2004.

Table 1-1 – Abbreviations and nomenclature

AWP	Approved Works Program
DAMP	Distribution Asset Management Plan
DFA	Delegated Financial Authority
DMS	Document Management System
ERA	Economic Regulation Authority
NFI	*New facilities investment* has the meaning defined in the Electricity Networks Access Code 2004
NFIT	*New facilities investment test* has the meaning defined in the Electricity Networks Access Code 2004
IMO	Independent Market Operator
PWP	Proposed Works Program
SAMP	Strategic Asset Management Plan
SCI	Statement of Corporate Intent
SOO	Statement of Opportunities (Produced annually by the IMO)
SWIS	South West Interconnected System
TAMP	Transmission Asset Management Plan
WEM	Wholesale Electricity Market

1. INTRODUCTION

The Network Access Code 2004 ("the Code") establishes a framework for third-party access to electricity transmission and distribution networks. The Code promotes the economically efficient investment in, and operation of, networks and services in Western Australia to promote competition. In accordance with the Code, the ERA has approved Western Power's first Access Arrangement for the period from July 2006 to June 2009 and Western Power is now submitting proposed revisions to its access arrangement covering the period from July 2009 to June 2012.

The following sections outline the purpose of this report, describe the structure of the new facilities investment test in the Code and explain Western Power's approach to applying this test to its capital expenditure incurred during the first access arrangement period.

1.1 PURPOSE OF REPORT

The purpose of this report is to demonstrate that Western Power's capital expenditure during the first Access Arrangement period[1] aligns with the requirements of new facilities investment test as defined in the Code.

1.2 THE NEW FACILITIES INVESTMENT TEST

This section describes the purpose and characteristics of the new facilities investment test.

1.2.1 Inclusion of New Facilities Investment in the Capital Base

Western Power is responsible for maintaining and upgrading the electricity network to meet the needs of electricity users on the SWIS. In order for the relevant amount of Western Power's capital expenditure to be added to the capital base, and therefore earn a regulated return on investment, it must meet the requirements of the new facilities investment test (NFIT) as set out in clause 6.52 of the Code or meet clause 6.56 of the Code.

The NFIT is essentially a test of whether capital expenditure is efficient and prudent. Capital expenditure to which the NFIT is applicable is termed new facilities investment (NFI) in the Code, as per the following definitions:

> *"**new facilities investment**", for a new facility, means the capital costs incurred in developing, constructing and acquiring the new facility.*
>
> *"**new facility**" means any capital asset developed, constructed or acquired to enable the service provider to provide covered services including assets required for the purpose of facilitating competition in retail markets for electricity.*

The wording of the NFIT in Clause 6.52 of the Code is repeated below:

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

[1] The first access arrangement period, referred to as the "AA1" period is from 1 July 2006 to 30 June 2009.

(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.

Both part (a) and part (b) of the test must be met. Part (a) essentially requires that the NFI is prudent and efficient, while part (b) describes a number of supplementary tests that relate to the purpose of the investment as well as its prudence and efficiency.

Leg (i) of part (b) also includes the option to utilise a "modified test". However, Western Power has not included a modified test in the current Access Arrangement, so this element is not considered further.

The ERA's NFIT Issues Paper[2] explains that the portions of NFI for a particular project that satisfy different legs of part (b) of the NFIT, can be aggregated to determine the total NFI that may be added to the capital base.

The alternative method by which NFI may be added to the capital base is via Clause 6.56 of the Code. This clause allows customer-funded portions of NFI to be added to the capital base provided that certain conditions, including part (a) of the NFIT, are met. The wording of clause 6.56 of the Code is repeated below:

[2] Issues Paper on the New Facilities Investment Test for a 330 kV Transmission Line and Associated Works in the Mid-West Region of Western Australia, 23 May 2008, Economic Regulation Authority.

Despite section 6.52, if:

(a) a capital contribution has been, or is expected to be, provided to the service provider; and

(b) the new facilities investment in respect of which the capital contribution is made meets the requirements of section 6.52(a); and

(c) an amount in respect of the capital contribution is deducted from the service provider's target revenue, then an amount of new facilities investment in respect of the capital contribution may be added to the capital base

Therefore, part (a) of the NFIT is applicable to all new facilities investment including customer funded works.

1.2.2 Actual and Forecast New Facilities Investment

This report covers all new facilities investment during the three-year AA1 period from 1 July 2006 to 30 June 2009. Therefore, part of the NFI considered in this report is actual expenditure and part is forecast expenditure.

1.2.3 Difference to the Regulatory Test

For clarity, it is useful to compare the new facilities investment test and the regulatory test provisions of the Code.

The regulatory test is required to be undertaken on forecast capital expenditure for major augmentation projects greater than $5 million (CPI adjusted) for wholly distribution projects or $15 million if the project includes any transmission assets.

The regulatory test is applied to these major augmentations in addition to the new facilities investment test. The regulatory test's focus is on the maximisation of net benefits of the project to network users. It is noted that this provides similar practical outcomes to the NFIT's focus on the efficient minimisation of costs. In practice therefore, any investment that satisfies the regulatory test is likely to satisfy the NFIT, and vice versa.

2. EXPENDITURE APPLICABLE TO THE NFIT

Western Power has engaged consultants Harding-Katz to provide advice relating to the application of the NFIT to the categories of Western Power's capital expenditure. PB has been provided with this advice, agrees with it's conclusions and has incorporated it into its assessment as presented in this report. The advice from Harding-Katz is reproduced here.

> "As described in section 1, the NFIT requires Western Power to invest in an economically efficient manner. The principle is that if an investment does not satisfy the NFIT, it cannot be added to the capital base and the service provider is denied an opportunity to earn a reasonable return on its investment. There is an obvious parallel with competitive markets, where competition and commercial pressures ensure that only efficient investments are remunerated. It is also noted, however, that competitive markets do not apply an "after-the-event" or "ex post" administrative mechanism such as an NFIT test to determine whether an investment decision was efficient. The question arises, therefore, as to whether and in what circumstances an administrative mechanism such as an "after the event" NFIT test needs to be applied to regulated companies, or alternatively, whether commercial incentives similar to those in competitive markets could instead be brought to bear.
>
> In this context, it is instructive to examine the approach that has been applied by another Australian regulator (the Essential Services Commission, Victoria, or ESCV) to determine the amount of new capital investment that is to be included in the capital base, where provisions similar to those contained in clause 6.52 of the Code apply.
>
> The Code's NFIT provisions are very similar to those contained in sections 8.15, 8.16 and 8.17 of the National Gas Code[3]. In particular, section 8.15 of the National Gas Code provides that the capital base can only be increased by the value of new investment that meets a test which is virtually identical to the NFIT set out in clause 6.52 of the Code.
>
> In applying these provisions to gas distributors in Victoria, the ESCV has interpreted the National Gas Code as allowing the regulator to rely on the incentive properties of the regulatory framework to provide assurances that the actual capital expenditure incurred by a regulated company can be assumed to be efficient. In particular, the Office of the Regulator-General (the ESCV's predecessor) has made the following comments in relation to the National Gas Code[4]:
>
> > *"[The] Gas Code requires capital expenditure to pass a number of tests for it to be included in the distributors' regulatory asset bases and reflected in regulated charges. These include that the amount reflects an efficient (least-cost) means of providing the relevant service...*
> >
> > *The Office has noted that there are at least two approaches that it could adopt to form an opinion as to whether these requirements have been satisfied. One option would be for the Office to obtain information on the projects that have been undertaken, and to form its own view as to whether such projects are adequately justified and reflect efficient technologies and practices…*
> >
> > *An alternative option would be to analyse the commercial incentives that may have influenced distributors' expenditure decisions over the regulatory period,*

[3] Whilst the National Gas Code will shortly be replaced by the National Gas Rules and the National Gas Law, these provisions are nevertheless instructive in examining how they have been applied in practice by other regulators.

[4] Office of the Regulator-General, *2003 Review of Gas Access Arrangements: Position Paper*, September 2001, pages 31-33.

> *and to infer the efficiency of their investment decisions from the operation of these incentives…*
>
> *These incentives – and the inferences that they would permit to be drawn – include the following:*
>
> - *the incentive to minimise expenditure – under a price cap regime, lower expenditure implies higher profits. In turn, this suggests that a distributor would be likely to adopt a least-cost approach…*
>
> *Accordingly, the Office [considers] that it may not be unreasonable to infer that the distributors' capital expenditure over the period has met the Gas Code's requirements…"*

Following consultation, the approach outlined above was adopted by the regulator, as noted in the following statement:[5]

> *"The Office has to form a view about the extent to which the capital expenditure undertaken by distributors over the first regulatory period meets the requirements of the National Gas Access Code, and hence can be included in the regulatory asset base.*
>
> *Amongst other things, this requires the Office to form a view as to whether the expenditure incurred was prudent and efficient. The Office has noted in its previous consultation papers that it considers it appropriate to draw inferences from the distributors' commercial incentives with respect to capital expenditure when applying this test. It has analysed these incentives, and concluded that it is appropriate to draw an inference that the distributors' capital expenditure would meet the National Gas Access Code requirements."*

Harding-Katz considers that the approach adopted by the ESCV provides useful guidance in considering the practical application of clause 6.52 of the Code to assess the value of NFI to be added to Western Power's capital base at the commencement of the next access arrangement period. In particular, it is considered reasonable to infer that Western Power's actual and forecast capital expenditure during the first access arrangement period is prudent and efficient - and therefore can be added to the capital base - where Western Power has a commercial incentive to invest in a prudent and efficient manner. In this context, it is noted that in relation to those categories of capital expenditure that are *not* subject to the Investment Adjustment Mechanism[6]:

- Western Power will not be compensated if its level of actual capital expenditure exceeds the allowance provided in its revenue cap;
- similarly, under its revenue cap, Western Power retains the benefits of any savings that arise if its actual capital expenditure is less than that provided in its revenue cap;
- Western Power therefore faces strong incentives to minimise its capital expenditure in all expenditure categories that are not subject to the Investment Adjustment Mechanism; and
- it is therefore reasonable to infer that all actual and forecast capital expenditure for the first access arrangement period in those categories not subject to the Investment Adjustment Mechanism is efficient and prudent, and meets the requirements of the NFIT. Furthermore, the costs of conducting a regulatory review of these investment decisions would not be offset by any benefits of

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5 Office of the Regulator-General, *2003 Gas Access Arrangements Review: Further guidance to gas distributors*, December 2001, page 32.

6 See clauses 5.49 to 5.53 inclusive of Western Power's access arrangement.

> improved investment decision making. In effect, any regulatory review of these investment decisions would simply expose Western Power to unnecessary stranded asset risk.
>
> On this basis, the scope of this report is limited to examining the application of the NFIT to those capital expenditure categories that are subject to the Investment Adjustment Mechanism, as listed in clause 5.53 of Western Power's access arrangement."

The scope of this report is consequently limited to examining the application of the NFIT to those capital expenditure categories that are subject to the Investment Adjustment Mechanism as listed in clause 5.53 of Western Power's access arrangement. Consequently, the capital expenditure categories that are specifically addressed in this report are the growth related networks categories that include:

- Capacity Expansion (Transmission and Distribution)
- Customer Access (Transmission and Distribution)
- Generation Driven (Transmission)
- Gifted Assets (Distribution)

3. APPROACH

This section of the report outlines the approach taken in the assessment of new facilities investment in the first access arrangement period (AA1) against the requirements of the new facilities investment test. In particular the structure of the assessment is presented and the method by which investment is aggregated into regulatory categories is discussed.

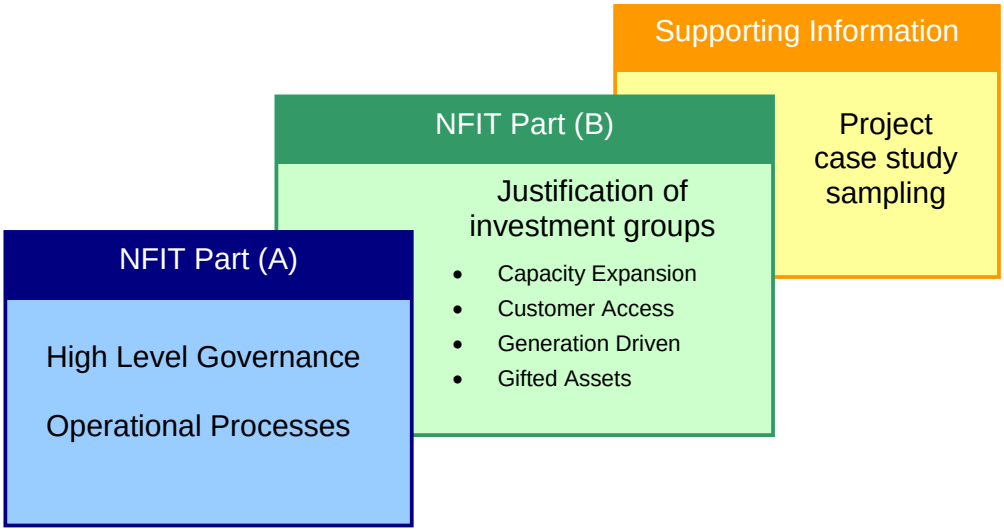
3.1 STRUCTURE OF NFIT ASSESSMENT

The general approach adopted for the assessment of growth related new facilities investment during the AA1 period against the new facilities investment test is structured into three layers as shown in Figure 3-1. The assessment flows from high-level considerations, through detailed qualitative justifications, to a sampling of projects to demonstrate compliance.

Under the proposed approach, Western Power's governance arrangements and procedures will be used to show that certain requirements of the NFIT are met. This will be supported by case study examples of projects to demonstrate that the procedures are put into practice and result in outcomes that satisfy the NFIT.

The approach also aggregates capital expenditure into investment groups based on regulatory categories. The aggregation of investment is consistent with the ERA NFIT Issues Paper[7] which indicates that there may be a need to aggregate expenditures into categories for the purpose of applying the NFIT.

Figure 3-1 Approach for structuring the NFIT submission



Each stage of the assessment is presented in the following sections of this report.

[7] Clause 20 of "Issues Paper on the New Facilities Investment Test for a 330 kV Transmission Line and Associated Works in the Mid-West Region of Western Australia", 23 May 2008, Economic Regulation Authority.

3.2 GOVERNANCE AND PROCEDURES

In order to provide a complete overview of the efficiency of new facilities investment, the treatment of high level governance and operational processes follows the progression of investment from the strategic level through to implementation. Figure 3-2 presents this progression as a series of stages. Each stage along this progression is described in detail in Sections 4.1 and 4.2 of this report.

Figure 3-2 The coverage of investment by high-level governance and operational processes

	High-level governance	Operational processes
Investment Conception ↓	Corporate Objectives	
	Optimisation & Risk Assessment	
	Strategic Planning	Detailed planning
	Internal Processes	Business case process
	Works Program Process	
	Resourcing Strategy	
Investment implementation		Project Estimation
		Project Implementation

Western Power is continuing a process of structural reorganisation as well as the updating of systems and procedures in order to align with the regulatory framework under which it operates. The timeline below in Figure 3-3 shows how the first Access Arrangement was handed down 1 year into the AA1 period, and coincides with the start of a wide-ranging update of Western Power's procedural documentation. Therefore, the degree to which Western Power's procedural documentation aligns with its regulatory requirements varies across the AA1 period to date and will continue to mature throughout the remainder of the AA1 period.

Figure 3-3 Timeline of events that impact on procedural documentation

Prior to AA1	AA1		
2005-2006	**2006-2007**	**2007-2008**	**2008-2009**
Apr 2006 - Disaggregation	**May 2007** - AA1 approved	**Second half 2007** - Update to WP documentation and procedures commenced	**July 2008** - AA2 Access Arrangement submission drafted - AA1 NFIT assessment completed

3.3 GROUPING OF INVESTMENT

The assessment of NFI against the requirements of the NFIT is conducted using the approach of aggregating NFI according to the regulatory categories of capital expenditure. This approach is described in the ERA NFIT Issues Paper and is considered by PB to be appropriate. The benefit of this approach is in the resource efficiency of the assessment. To apply the NFIT to all individual facilities or projects would be impractical and highly resource intensive due to the volume of projects undertaken by Western Power. The exception to this is where pre-approval of large projects against the NFIT is specifically sought.

The regulatory categories that have been used for the aggregation of transmission & distribution growth new facilities investment are as follows:

1. Capacity Expansion (Transmission & Distribution)
2. Customer Access (Transmission & Distribution)
3. Generation Driven (Transmission)
4. Gifted Assets (Distribution)

The total value of all actual and forecast new facilities investment for the AA1 period is **$2,503.1 million**. The breakdown of total expenditure into each regulatory category is presented in Table 3-1.

Table 3-1 New facilities investment during the AA1 period (actual and forecast)

Investment Group & Regulatory Category	Value [$m]			
	06/07 Actual	07/08 Actual	08/09 Forecast	Total
1 Growth Transmission	**249.0**	**267.5**	**375.6**	**892.1**
Capacity Expansion (CE)	118.4	106.0	188.3	412.6
Customer Access (CA)	17.9	73.4	47.8	139.1
Generation Driven (GD)	112.7	88.1	139.5	340.3
2 Growth Distribution	**278.9**	**271.2**	**315.4**	**865.5**
Capacity Expansion (CE)	75.9	61.4	89.2	226.5
Customer Access (CA)	181.0	189.5	131.9	502.4
Gifted assets	22.0	20.3	94.3	136.6
3 Non Growth Networks	**137.5**	**179.1**	**274.4**	**591.0**
AR - Asset Replacement Transmission	12.9	11.4	26.8	51.1
AR - Asset Replacement Distribution	27.3	39.4	61.1	127.8
RC - Regulatory Compliance Transmission	3.9	5.7	19.0	28.6
RC - Regulatory Compliance Distribution	34.0	34.7	65.6	134.2
RD - Reliability Driven Transmission	4.8	5.1	2.0	11.9
RD - Reliability Driven Distribution	5.5	18.9	28.8	53.2
SC - SCADA & Comms Transmission	5.5	3.8	4.7	14.1
SCADA & Comms Distribution	2.2	2.1	2.6	6.9
Metering (Distribution)	10.7	12.4	12.6	35.7
SUPP (Distribution)	21.1	22.0	29.3	72.3
RPIP (Distribution)	9.6	23.6	22.0	55.2
4 Corporate	**36.1**	**57.4**	**61.1**	**154.6**
IT (Incl Market Reform) Transmission	6.0	11.3	8.5	25.8
IT (Incl Market Reform) Distribution	18.0	34.0	24.6	76.5
Support Transmission	3.0	3.0	7.0	13.1
Support Distribution	9.1	9.1	21	39.2
TOTAL INVESTMENT	**701.4**	**775.2**	**1,026.6**	**2,503.1**

3.4 PROJECT DOCUMENTATION

To support the assessment of NFI within each of the investment groups outlined in Section 3.3, specific project documentation has been sourced and assessed. A sample of projects across the investment groups has been selected according to the materiality of investment during the AA1 period and with a view to covering a range of different regulatory categories. The intention of the project documentation assessment is to provide case studies that demonstrate how the Western Power governance and procedures result in outcomes that are consistent with the requirements of the NFIT.

4. NEW FACILITIES INVESTMENT TEST – PART (A)

This Section of the report describes how Western Power's new facilities investment meets the requirements of Part (a) of the NFIT as set out in clause 6.52(a) of the Code.

Part (a) of the NFIT requires that for new facilities investment to be added to the capital base:

> *the new facilities investment does not exceed the amount that would be invested by a service provider efficiently minimising costs.*

This can be summarised by the requirement that new facilities investment is efficient. For new facilities investment to be considered efficient, it should be evident that the investment satisfies a number of criteria as listed below:

- the right option (lowest sustainable cost) has been selected for implementation at the right time
- the evaluation of project costs is accurate and considers the long-term forecast change in load and sales as well as any economies of scale and scope that are available
- the labour and materials are procured using a strategy for least-cost
- the project is implemented using rigorous cost-control and project management techniques.

Western Power covers these criteria using a range of internal processes that form the capital investment governance framework. The higher level elements of the capital investment governance framework are discussed in Section 4.1. These higher level processes then set the direction for the operational processes discussed in Section 4.2. Section 4.3 covers the specific requirements of Part (a) of the NFIT as set out in 6.52 (a)(i) and (ii).

Table 4-1 lists the Western Power processes and elements of governance that directly address the efficiency criteria.

Table 4-1 Western Power processes that address the NFIT efficiency criteria

Efficiency Criteria	Western Power Process
The lowest sustainable cost option has been selected for implementation at the right time	Planning process Business case process
The evaluation of project costs is accurate and considers the long-term forecast change in load and sales as well as any economies of scale and scope that are available	Planning process Business case process Estimating process
The labour and materials are procured using a strategy for least-cost	Resource planning Materials procurement process
The project is implemented using rigorous cost-control and project management techniques	Project implementation

4.1 HIGH-LEVEL GOVERNANCE

This section demonstrates that the principles of efficiency and prudence of investment, in line with Part (a) of the NFIT, are in place at the highest levels of governance and act to drive efficient and prudent capital investment. The hierarchy of governance is followed from the top level down through the more detailed and specific policies and operational procedures that are addressed in Section 4.2.

The discussion of governance covers the following main items:

- Corporate Objectives
- Risk Assessment and Optimisation
- Strategic Planning
- Internal Processes
- Works Program Process
- Resourcing Strategy
- Regulatory Framework

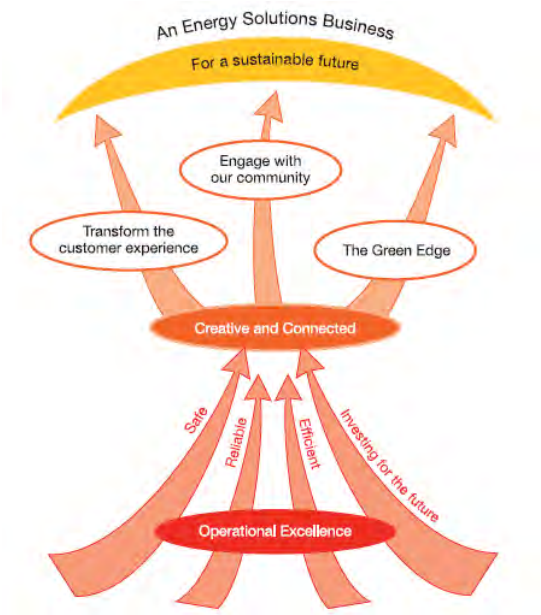
4.1.1 Corporate Objectives

On 1 April 2006, Western Power Corporation was restructured into four new corporations. The Networks Business Unit of the original integrated Western Power Corporation became the current Western Power.

Subsequently, Western Power established a vision to re-position itself as an energy business that delivers and supports sustainable energy solutions for customers.

Objectives arising from the vision, and from information provided by stakeholders and regulatory obligations, have been developed. The key objectives of Western Power, to be “safe”, “reliable”, “efficient” and “investing for the future”, now drive the strategic direction of the company, as illustrated in the following diagram.

Figure 4-1 Western Power Strategic Direction[8]



The high level objectives of Western Power are presented in the Statement of Corporate Intent (SCI). The latest version of this document is the Statement of Corporate Intent 2007/08, 13 June 2007[9]. Western Power's corporate requirements include a set of commercial requirements described as follows:

> *"Western Power is required to act in accordance with prudent commercial principles and endeavour to make a profit consistent with maximising its long-term value."*

Western Power's strategic direction is represented by strategic themes, one of which is operational excellence. The aim of the operational excellence theme is to deliver "*continuously improving, timely, efficient, sustainable, quality service*". Timeliness and efficiency are at the root of good commercial practice.

As part of its investment program, the SCI states that the following outcome should be achieved:

> *"the life-cycle costs of providing services should be minimised by appropriately balancing operating and capital expenditure"*

This outcome is closely aligned to the requirements of NFIT in that investment costs are to be minimised (6.52(a) "*efficiently minimising costs*") and that the costs in question are treated over the long term rather than the short term (6.52(a)(ii) "*lowest sustainable cost*").

These high-level principles of investment efficiency flow throughout the remainder of the governance documents as described in the following sections.

8 Source: Western Power 2007 Annual Report, p.7

9 www.westernpower.com.au/ subContent/aboutUs/ourProfile/Statement_of_Corporate_Intent.html

4.1.2 Risk Assessment and Optimisation

A key factor that facilitates efficient investment is risk assessment and subsequent optimisation of investment based on consideration of these risks in the context of corporate strategic objectives. Western Power aims to manage its business risks effectively and efficiently, and is continuing to develop its risk assessment and optimisation function. There are a number of procedures in place and under development that cover risk assessment and optimisation.

Risk Management Policy – 1.5.1 (DMS# 3842495)

The Risk Management Policy is the top-level document that sets the direction and importance of risk management within Western Power. From the policy document:

> *"Risk management is integral to the successful achievement of Western Power's goals and a key requirement of effective corporate governance.*
>
> *Western Power's policy is to ensure that risk management…is embedded throughout the business and managed in a structured and systematic manner, which assists personnel to make informed decisions and achieve successful business outcomes."*

The intended outcomes of the policy include assurance to the Board that risks are being managed effectively and that business performance is improved through informed decision making.

Western Power Risk Management Framework (DMS# 3017083)

Western Power has developed a project risk management framework that is consistent with the standard AS/NZS 4360:2004. It consists of a Capital Project Risk Management process and an Investment Optimisation Planning Tool.

The Capital Project Risk Management Process aids the effective management of individual project risks. The process provides a systematic framework for planning, identifying, analysing, responding to, and monitoring, project risks. Three risk 'tiers' are used to classify project options.

- **Tier 1 (Low Risk)** is for projects with routine activities and can be considered to be extensions to current operations e.g. extension of existing networks, selection of least cost options for minor capital expenditure and maintenance.
- **Tier 2 (Medium Risk)** is for projects where the nature of the project represents a higher level of risk to the business e.g. provision of secured funding of customer assets, co-generation projects.
- **Tier 3 (High Risk)** is for projects with a significant departure from the core activities of the organisation. Characteristics include a high level of expenditure, long timeframes or uncertain success of the project e.g. new business venture other than electricity, acquisition/construction of long life generating plant.

In assessing project risk, different aspects are assigned to particular risk tiers in order to determine the overall project/option risk. Examples of characteristics include: technology, project scale, payback duration, regulatory environment and management experience.

The project team completes the risk management plan and the risk register. The team updates the register regularly in each subsequent lifecycle component and continues to monitor and control risks throughout the life of the project.

Other Risk Management and Optimisation Governance

The Investment Optimisation Planning Tool (described in DMS# 4340994) seeks to identify and select treatments that offer the best risk mitigation value across the network risk portfolio. Using the efficient frontier analysis approach, the tool is used as an input

into the efficient sequencing of the capital and operational works programs. The tool currently provides broad outcomes and is being further developed.

Western Power has considerable further governance arrangements that cover risk assessment and optimisation including policies, procedures, systems and guidelines as listed:

- Project Risk Management Presentation (DMS# 2051371)
- Western Power Risk Management Framework (DMS# 3861477)
- Capital Project Risk Management process (DMS# 4873093)
- SWIS NETWORK Asset Risk Management - Detailed Requirements for Investment Optimisation System (DMS# 3860519)

4.1.3 Strategic Planning

Strategic planning processes form an important high-level function in that they draw together the detailed plans from separate areas of the company, provide an overview of investment for management, provide stakeholder information and facilitate stakeholder feedback. Each of these outcomes is aligned with maximising the efficiency of Western Power's planned investment.

The key governance documents relating to the efficient strategic planning of network investment are the:

- Strategic Asset Management Plan 06/09
- Annual Asset Management Plans (Transmission, Distribution)
- Annual Planning Report

Strategic Asset Management Plan (DMS# 2362422)

The Strategic Asset Management Plan (SAMP) is produced every three years to coincide with the regulatory periods.

The SAMP sets out the overriding principles used to plan and manage both new investment and existing assets. It outlines the asset management strategies and processes employed by Western Power in order to meet the numerous business requirements such as safety, customer service, regulatory, environmental other statutory requirements. The SAMP also summarises the prudent and efficient management principles employed by Western Power in undertaking network related investment.

For investment in new assets, the SAMP describes how Western Power's network planning process is strongly focussed on balancing networks costs against the impact of supply reliability on its customers. Risk management is applied when considering options to develop the network including the Shareholder Value Add (SVA) toolkit. In order to cover the prudence and efficiency of investment, during the planning phase, a number of options are identified. Detailed studies including steady state load-flow, transient and contingency analysis are undertaken to develop various network development options to meet key objectives and performance outcomes. This process results in selection of least cost alternatives and optimal timing of development works.

As well as meeting required service and safety levels, some of the key objectives of the management of existing network assets are to reduce operating costs, extend the economic life of the assets and to increase the economic return on the assets.

Transmission and Distribution Asset Management Plans

The Transmission Asset Management Plan (TAMP) and the Distribution Asset Management Plan (DAMP) provide a more detailed view of the management of existing assets than is provided in the SAMP. The TAMP and DAMP set out methodologies for asset management, specific asset issues and requirements and presents forecast capital and operating expenditure for a 10 year horizon. The TAMP and DAMP aim to facilitate:

- effective performance assessment and efficient asset maintenance
- ongoing and long term asset performance/risk management (through asset management strategy)
- maximum returns on the assets and improvement of their value

Annual Planning Report (DMS# 4678963)

The Annual Planning Report (APR) for transmission and distribution is an important tool that Western Power uses to inform current and prospective users of the SWIS about the changes and proposed developments in the network. The APR aligns to the demand forecasts of the IMO Statement of Opportunities (SOO) and adds additional layers of detail in terms of identifying demand forecasts for individual substations and for all load areas. The APR identifies the specific augmentation, expansion, and reinforcement projects that are proposed for each load area. The APR takes a 10 year timeframe, but provide more detailed information for a 5 year horizon including tabulated substation load forecasts and fault levels.

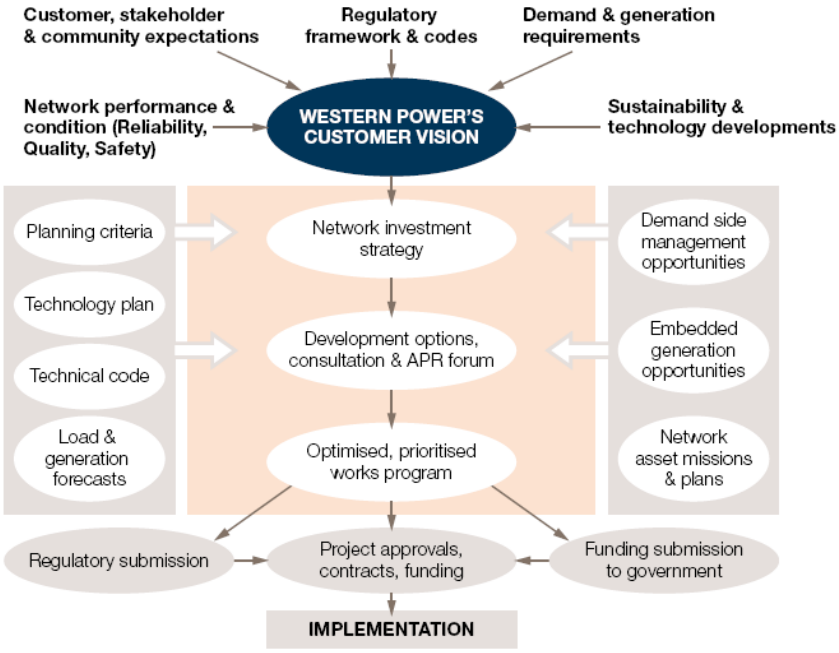
The APR is a strategic tool in that it is designed to increase the overall efficiency of network investment of Western Power and network users, which is of benefit to all parties. By providing information about network planning, network users are best able to:

- plan investment (such as local generation or demand-side management) that reduces current or forecast network constraints
- determine whether a planned investment by the user could delay network investment by Western Power
- determine whether a planned investment by the user could bring forward network investment by Western Power

In any of the above cases, the sharing of information and plans between parties will result in the ability to develop a more efficient response to changes in the network.

The APR also summarises the Western Power's network development planning process. At the highest level, the APR distils the planning process as the need to "*balance network costs against the impact of unreliable supply*". The regulatory framework under which Western Power operates sets the bounds by which this balance can be reached. In particular, the regulatory framework is seen by Western Power as one of five key inputs in the process of planning for investment as shown in Figure 4-2.

Figure 4-2 Overview of Western Power planning process[10]



APRs have been produced across the AA1 period, and all investment undertaken during the AA1 period will have had the opportunity to benefit from an APR. The 2007 APR covers network development plans from 2006 to 2016. The latest APR (2008) covers network development plans from 2008 until 2017.

4.1.4 Internal Processes

Western Power employs internal governance processes to strengthen the rigour of decision making and to help reach optimum commercial and technical solutions. Two key processes are the:

- Delegated Financial Authority
- Internal Relationship Plans

Delegated Financial Authority

The delegated financial authorities within Western Power provide a structured framework for investment approval and work to strengthen the rigour of decisions regarding new facilities investment. The use of delegated financial authorities is also intended to minimise the risks of fraud, corruption and financial loss.

The use of delegated financial authorities is set at the top-level of governance by the Delegated Financial Authority Policy (DMS# 3435391) and is put into practice through the Delegated Financial Authority Guidelines (DMS# 3435202). The guidelines are presented in detail and set the levels of authority for all types of financial decision making within Western Power.

[10] 2007 Transmission and Distribution Annual Planning Report, p.15

Internal Relationship Plans

For operational efficiency, the structural division of activities such as network expansion planning and asset management is beneficial as the objectives and processes used for such activities can be distinctly different. However, to optimise the efficient use of assets, there needs to be a coordination of all activities. A general example of the need for coordination is where a capacity expansion requires the upgrading (and therefore replacement) of equipment. The asset management division therefore needs to know about this plan so that the management strategy for those assets can be optimised, such as extending the life of the assets until the upgrade, or if the assets require replacement in the interim, replacing them with the higher capacity specifications as required by the expansion plan.

Where this coordination is critical to efficient asset investment, internal relationships have been formalised in Western power through the development of internal relationship plans. These plans identify the overlaps, synergies and best methods for ensuring efficient communication between the divisions in question.

A specific example of such a plan is that for Asset Investment & Risk – Transmission System Capacity (DMS# 3681782).

4.1.5 Works Program Process

The Works Program is an important aspect of the governance surrounding new facilities investment. For NFI to be undertaken it must be part of the Approved Works Program (AWP). The AWP is formed when the works program submitted to the regulator, as part of an access arrangement, is approved. In between the three-year regulatory period access arrangements, changes to the AWP are closely controlled by annual resets that require Board approval. The annual resets are reported in The Works Program Annual Submission documents. The latest of these submissions is the 07/08 submission (DMS# 4180458). In between the annual board approved re-sets, changes to the AWP are closely controlled by the Change Control process. This structure provides a high level of rigour to the consideration of expenditure that forms part of the AWP, including all new facilities investment.

The Works Program Manual (WPM) (DMS# 3565515) sets out the process by which the works program is developed and approved from the Unconstrained Works Program (25 year horizon), to the Proposed Works Program (10 year horizon), to the Approved Works Program (3 year horizon). The development and approval of the works program is overseen by the Program Performance Committee (PPC) and the Works Program Committee (WPC). The PPC focuses on program delivery and has a lower level of delegated financial authority than the WPC which focuses more on program performance.

The AWP and Change Control process is governed by a series of procedures:

- Works Program Committee and Program Performance Committee Charter and Terms of Reference (DMS# 3137631)
- Works Program Estimation Procedure (DMS# 3508445)
- Works Program Development and Approval Process Overview (DMS# 3093706)
- CSD – Investment Strategy and Work Programs (DMS# 3093706)
- CSD AWP Criteria for Change Control (DMS# 3606882)
- Change Control Procedure (DMS# 3508495)
- Change Control Work Instruction (DMS# 3507960)
- Program Delivery Change Control Work Instruction (DMS# 3508552)
- Project Contingency Management Process (DMS# 3279516)
- Change Control Register (DMS# 3396299)

- Works Program Change Control Submission Form (DMS# 3298469)

4.1.6 Resourcing Strategy

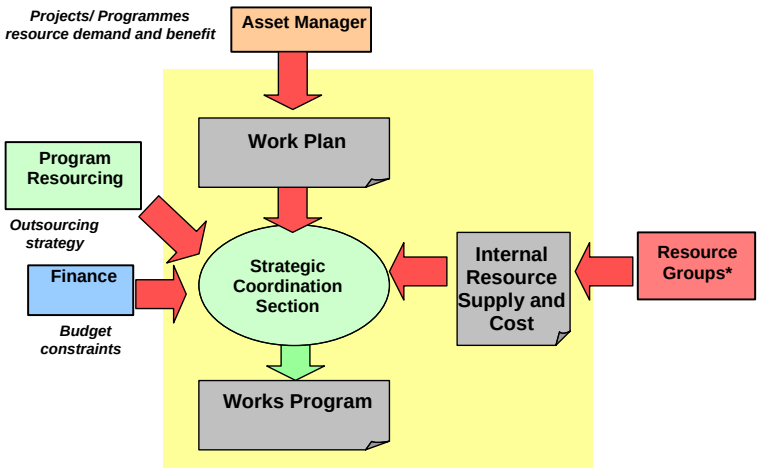
Efficient investment requires that the optimum resource is chosen for a particular work package and that equipment and services are obtained at or below current market rates. Resourcing at Western Power is achieved through a mixture of in-house and out-sourced resources.

High-level resource planning and work scheduling (DMS# 3228356)

The coordination of resources and the interaction between the program of works that is planned and the program of works that is achievable is undertaken by the Works and Resource Planning Branch.

The Works and Resource Planning Branch is responsible for the high-level resource planning and work scheduling within Western Power. In practice this means that the Branch is responsible for providing a strategic view of the work that the company believes needs to be undertaken, together with the resources (people, materials and equipment) and durations needed to deliver that work, and determining a viable works program taking into account the priority of the work, resource availability and budget constraints. This process is illustrated in Figure 4-3.

Figure 4-3 Works and Resource Planning Branch resource planning process



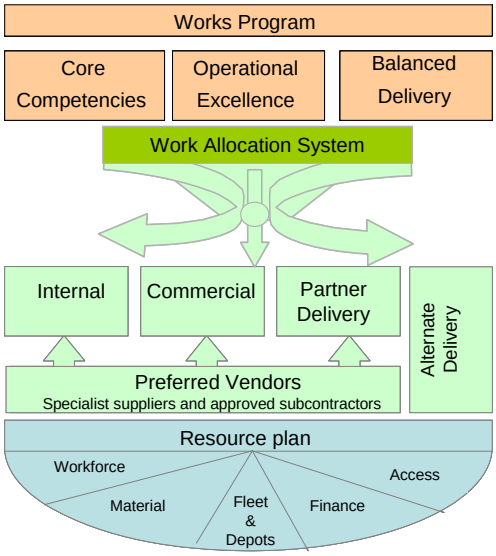
Strategic Delivery Framework

Due to the industry restructuring and the tightening of the equipment and skilled labour markets in Western Australia, Western Power has begun a process to change the way it resources and delivers projects. Western Power has developed a long-term Strategic Delivery Framework with respect to the delivery and resourcing of the forecast works program. The focus of this framework is to establish a balanced 'portfolio' of service delivery options to maximise Western Power's flexibility to change with changing needs and demands as well as reduce the long term cost of service delivery.

The core of the framework, as shown in Figure 4-4, consists of a work allocation system that was first developed in 2008. It assesses the delivery risk of each type of work type and allocates high risk work to internal resources and lower risk work to Western Power's

contractors. An outcome of this approach is the allocation of a greater portion of work types to contractors than previously.

Figure 4-4 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 Program is critical for successful delivery.
2. Below the Works Program are the links to the corporate objectives as defined under Operational Excellence, i.e. 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

In the pursuit of efficient resourcing, Western Power takes a detailed consideration of the most appropriate contractor arrangements:

- alliance partners
- partner delivery agreements
- commercial contracts
- preferred vendors
- alternate delivery mechanisms.

In addition to Western Power's own internal delivery capability, each of these delivery mechanisms is discussed below. Of particular importance is the aim to increase resources under each delivery strategy, so as to provide an adequate work force to meet the increased works program proposed for the current and next regulatory periods.

Internal delivery

Western Power's internal operational workforce has core competencies in delivering most areas of the works program, including maintenance, overhead and underground distribution services, new sub stations and upgrades, and transmission line upgrades. A major strength of the internal workforce is in planning and design, which Western Power supplements with external designers during peak workload periods.

Alliance partners

Western Power has recently put in place a multi partner alliance with Downer EDI and Tenix and a single partner alliance with Transfield Services. These alliance partners will be responsible for the end-to-end delivery of new and upgraded transmission substations,

new transmission lines and customer-funded distribution programs. Western Power has undertaken discussions with its alliance partners about increasing resourcing to meet the future works program. Both alliance partners have indicated an ability to increase resourcing through a combination of overseas recruitment, interstate transfers of current employees, and targeted recruitment from eastern states of Australia.

Western Power's strategy through alliance arrangements is to develop long term relationships with resource companies based on co-operation and collaborative effort to provide greater certainty of supply in return for greater certainty of work and lower margins than would be expected in tender negotiations. Further, the alliance arrangements include:

- a pain/gain share arrangement to drive all parties to achieve cost, quality and timeliness targets
- provision for an independent estimator to review the cost estimates developed jointly by Western Power and the non-owner participants to ensure they are market reflective
- 'open book' accounting.

Under the alliance arrangement, Western Power is not absolutely committed to allocation of any parcel of work to the alliance until the cost estimate is accepted. Thus, in the event that a cost estimate is unsatisfactory, Western Power retains the right to explore alternative resourcing arrangements, such as via a tender process.

It is important to note that Western Power's alliance arrangements have been discussed with the State Supply Commission and no issues have been raised. It is also noteworthy that alliance arrangements have been successfully deployed by the Main Roads Department and Water Authority in Western Australia. They have also been used successfully by energy utilities in the National Electricity Market with endorsement by the relevant regulators.

Commercial contracts

Contracting of work using the AS 4000 series contracting standards has been a key component of Western Powers traditional delivery strategy. It will continue to be used for engaging industry in specific work assignments such as transmission customer-funded work, minor transmission line projects and for specialised services. Western Power has good relationships with many exiting companies in WA and continually scans the market for new entrants to WA to assist with its expanding program of works.

Preferred vendors

Western Power has established a panel through a competitive tendering process of pre-qualified contractors/suppliers and allocates work on an ad-hoc basis. The preferred vendor model is well established and will be used to supply specialist services and to provide support to the internal workforce and other prime delivery mechanisms. Being essentially non-industry specific, preferred vendors are able to adjust resources readily to suit the Western Power works program.

Alternate delivery

An alternate delivery option currently being considered is to allow customers to build parts of the network, which Western Power will ultimately own and operate. This is usually via Western Power's pre-qualified contractors; however Western Power does not fund or manage the work.

4.1.7 Regulatory Framework

The regulatory framework itself provides incentives for Western Power to invest prudently and efficiently in new capital assets.

The Code requires that all new facilities investment satisfies the NFIT and, in addition, that those projects classified as “major augmentations” also pass the regulatory test. In particular, PB understands that Western Power is not permitted to commit to major augmentations until the ERA has determined that the requirements of the regulatory test are satisfied.

In most cases, assessment of new facilities investment against the NFIT will occur “ex-post”. However, the Code also provides an option for Western Power to seek pre-approval of new facilities investment from the ERA. As a general policy, PB has been advised that Western Power seeks pre-approval of new facilities investment for major augmentations (i.e. those projects subject to the regulatory test) due to their high value and in order to mitigate the risk of the full value of the proposed investment not being approved at a later date.

4.2 OPERATIONAL PROCEDURES

Supporting the high level governance arrangements, as described in Section 4.1, are a number of operationally focussed procedures that put the governance arrangements into practice. The operational procedures that are relevant to a range of project types and categories across Western Power are discussed collectively in this section.

The procedures covered in this section include:

- Business case process
- Project Planning
- Project Estimation
- Project Implementation

4.2.1 Business case process

The business case is the key tool used to control the planning and approval of capital expenditure (including new facilities investment) within the corporate aims of efficiency and prudence of investment. The business case process is designed to facilitate commercially disciplined decision making and to ensure that value is created for all Western Power stakeholders within acceptable risk levels.

A central element of the business case is the assessment of multiple options in order to minimise costs while meeting all other requirements of the project. Costs are taken as an input from the estimating process and are used to conduct financial analysis. The results of the financial analysis are then used to select the option with lowest sustainable cost. The business case also tracks the approval of the project by the sponsoring group, by other engineering groups with an interest in the project and by management. In some cases, only one viable option exists (apart from the “do-nothing” option), however the business case is still valuable in this situation as it provides a structured framework to the review and approve the expenditure.

A second key element of the business case is that it summarises the rationale for the expenditure and identifies the risks that would exist if the project was not undertaken.

The business case process is governed by the Business Case Policy (DMS# 4958778) and is controlled by the Business Case Guidelines (DMS# 3198881).

4.2.2 Transmission Planning Process

The planning process employed for new facilities investment in transmission growth projects is designed to develop the best option at the right time in response to an identified need for augmentation of the transmission system. Multiple options are developed and assessed and the most relevant options are documented and presented in the business case.

The planning process takes into account the multiple potential interests in the assets in question, such as asset management interests & capacity expansion interests.

Western Power plans and develops its transmission network in accordance with the Technical Rules. Western Power has developed and employs a range of planning procedures and documentation aligned with industry best practice that cover the different stages of the planning of transmission growth investment. Key elements include:

- Technical Rules (as approved by the ERA under the Code)
- Transmission Network Planning Criteria (DMS# 1195855)
- Process of Planning the System (DMS# 3001186)
- Guidelines On Preparing Load Area Long Term Development (DMS# 1773882)
- Process of Creating A Generation Forecast And Generation Plan (DMS# 3000304)
- Process of Load Area Planning (DMS# 3000609)
- Process of Reviewing the 20 Year Budget (DMS# 3357625)
- Business Case Financial Evaluation Model (DMS# 3253766)
- Procedure Manual for Performing System Studies (DMS# 1538257)

The transmission system is broadly divided into the bulk transmission network, the sub-transmission network, radial networks and substations. The planning criteria for the transmission network are based on a risk analysis that takes into account:

- the size, extent and sensitivity of load or generation which may be affected
- the physical location of various components of the network and their exposure to damage risk
- the relative merits of other alternatives
- the efficient use of capital

Bulk transmission network

The bulk transmission network operates at 330 kV, 220 kV and 132 kV. It consists of the power station switchyards, major terminal switchyards and the interconnecting transmission lines.

In accordance with the Technical Rules and Western Power's planning criteria, the bulk transmission network is designed to withstand a single unplanned outage without loss of load. It is also designed to withstand one forced outage and one planned outage at 80% of forecast peak load (assuming generation rescheduling after the first outage).

The bulk transmission network requires this level of security given the high capacity of the bulk transmission network where outages may affect many customers.

Sub transmission networks

The sub-transmission network operates at 132 kV and 66 kV. It consists of zone substations and the interconnecting lines.

The sub-transmission network is generally designed to withstand a single unplanned outage without loss of load. When there is more than one outage at the same time, there may not be sufficient network capacity to meet all demand. Sometimes, there may be limited back-up capacity available via the distribution network. The Perth CBD has a higher level of security requiring continuous supply following two coincident outages.

Radial networks

Radial networks operate at 220 kV, 132 kV and 66 kV and generally supply loads of less than 20 MW. The 132 kV and 66 kV radial networks generally supply regional townships in Western Australia's South-West region.

Radial networks take into account analysis of network reliability, risk and economics. In a radial network, backup may be provided by other parts of the transmission network, the distribution network, local generation or not at all, depending on this analysis.

It is not always economically efficient to provide full redundancy on the radial networks due to the large line-lengths, geographically dispersed loads and generally smaller loads (when compared to urban areas).

Substations

Substations interconnect the sub-transmission network with the distribution network. Each substation is designed to meet planning criteria that depend on the substation's location and the type of load it supplies:

- substations in the Perth CBD are designed to provide the highest level of security due to the relative importance of the load supplied by these substations

- regional substations are designed to provide the next highest level of security recognising the long travelling times required before plant can be repaired or replaced, although there are some remote substations designed to provide a relatively low level of security

- substations in the Perth metropolitan area are designed to accept a higher level of risk of load shedding (loss of load) than in the CBD or regional areas, as they are more readily accessible for plant repairs or replacement. The designs of the various types of substation recognise the need to optimise security of supply and capital expenditure.

CBD substations are designed to withstand the failure of a single item of plant without any sustained loss of customer load. They are also designed to withstand the failure of either two items of plant or both lines that supply the substation with only a temporary interruption to customer load.

Most regional substations are designed to withstand the failure of a single item of plant without sustained loss of any customer load. A small number of regional substations are designed to withstand the failure of a single item of plant with a small risk that up to 10% of the load may need to be shed. This risk only applies for one percent of the time throughout a year and is based on the availability of suitable spares.

A small number of regional substations are not able to continue to supply customer load for a failure of a single item of plant. These substations have usually been established for the purpose of supplying a single customer and where the customer has accepted the risk of loss of supply. If nearby loads then take the opportunity to be supplied by these substations, it is often not economic to provide higher supply security.

Most substations supplying the Perth metropolitan area are designed to withstand the failure of a single item of plant (about a one in twenty-year event), accepting that some customer load may be shed, on a rotational basis, for up to nine hours. In line with commercial objectives, since 1996, Western Power has accepted the risk of short-duration load-shedding to maximise the utilisation of substation capacity.

4.2.3 Distribution Planning Process

The planning process employed for new facilities investment in distribution growth projects is designed to develop the best option at the right time in response to an identified need for a change to the distribution system. For larger projects, multiple options are developed and the most relevant options are documented and presented in the business case. The planning process takes into account the multiple potential interests in the assets in question, such asset management interests & capacity expansion interests. For smaller projects such as connections, Western Power has developed standardised designs in order to efficiently plan the investment.

Western Power develops its distribution network in accordance with the Technical Rules, published in April 2007. The distribution network operates at 33 kV, 22 kV, 11 kV, 6.6 kV and 415 V and is broadly separated into the CBD, urban and rural networks. Western Power has developed and employs a range of planning procedures, planning criteria and documentation aligned with industry best practice that cover the different stages of the planning of distribution growth investment. Key elements include:

- Design Manuals (on intranet)
- Design Guidelines (on intranet)
- Metro & Country Regional Planning & Development Processes (DMS# 3771462)
- Planning Standards for Country Distribution Capacity Expansion Projects (DMS# 4504167)
- Planning Standards for Metro Distribution Capacity Projects (DMS# 4489792)
- Distribution Network Planning Manual (DMS# 2149218)

The distribution planning requirements and criteria that drive new facilities investment in distribution growth projects are summarised below.

Western Power's distribution system is generally designed to operate radially. Normally, the loss of a network element will result in loss of supply to a number of customers. There are a number of factors that mitigate the length of interruption for customers.

Connections between feeders provide back-up for when the normal supply to a portion of a feeder is unavailable. Reclosers and sectionalisers are used to facilitate resupply to

sections of feeders. Western Power also uses fault indicators, load-break switches and remote-control pole-top switches to improve the speed of fault location and isolation. This facilitates rapid restoration of supply.

CBD

The CBD distribution network is an open-meshed and remotely-switched design. This facilitates rapid restoration of supply to healthy sections of the network after faults. In addition, CBD zone substations automatically reconfigure feeders after the loss of step-down transformers. The total loss of a single-zone substation requires manual network reconfiguration to restore supplies within four hours. CBD feeders are normally limited to 50 percent of their maximum rated capacity. This provides flexibility to remotely reconfigure the network and to restore load after a feeder outage.

Urban

Urban distribution networks in metropolitan areas and regional towns are open-meshed networks with radial feeders and inter-feeder ties that can be switched into service as required. This moderate level of interconnection between feeders and a planned maximum feeder loading of up to 80 percent allows for the transfer of load between feeders after a fault. In contrast to the CBD, this transfer of customer load may require a number of manual-switching operations.

This feeder arrangement minimises fault levels and simplifies technical and operational requirements. With multiple open points, improved supply restoration times are possible, although the initial loss of supply will still occur.

Rural

The distribution networks in rural areas are radial and are much longer than urban feeders, with limited inter-feeder ties due to the dispersed nature of these networks. As a result, supply restoration after a network fault can take longer. Some distribution feeders can be very long, with no interconnection to facilitate supply restoration.

Users requiring a level of supply security above that achieved through the standard design philosophy may be provided with an alternative (backup) supply or other network solution where practicable. Customer-side solutions, however, such as on-site standby generation may be more economic. Investment to provide additional security of supply is normally undertaken at the customer's expense.

4.2.4 Power quality requirements

Aside from the extensive planning criteria described above, Western Power applies technical requirements to ensure that the quality of electricity supplied to customers is acceptable. These requirements affect the design of the network and its elements. They include characteristics such as flicker, voltage limits, waveform distortion and waveform imbalance. Broadly speaking, the requirements are found in various national and international codes of practice and standards. They are widely accepted by electricity utilities and by electrical equipment manufacturers.

Western Power also has quality of supply obligations established by legislation. The Electricity (Supply Standards and System Safety) Regulations 2001 contain various quality-related benchmarks while the Technical Rules also set out technical requirements.

4.2.5 Project Estimation

Accurate estimation of project costs is an important factor in the efficient planning of projects and selection the least-cost option. The output of the estimation function is input to the business case process and is used for economic analysis of the project return.

Works Program Estimation Procedure (DMS# 3508445)

This procedure documents the high-level decision process involved in managing the estimation of a project for inclusion in the approved works program. The procedure tracks the work flow and decision points through the Western Power internal stakeholder groups from the identification of the need for an estimate through to the provision of the estimate

Cost Estimating of Engineering Projects (DMS# 4515944)

This manual describes how estimation fits within the Project Approval Process and provides detail around the development of an estimate. In particular, the concepts of accuracy and confidence in estimates are defined and the project approval stages of A0, A1 and A2 are aligned with increasingly strict tolerances on the accuracy and confidence level of the required estimates. This is summarised in Table 4-2. The risk assessment conducted as part of the estimating process also increases in scope and detail as the project approval stages advances. This is also reflected in Table 4-2.

Table 4-2 Required increase in accuracy and confidence of project cost estimates

Estimate Level	Scope Definition Detail	Comment	Accuracy	Risk Allowance	Risk Assessment
A0	Desktop design	Project Creation May look at 7-10 options to help develop short list	30%	P80 Risk[11]	Cost risk
A1	Proof of concept	Approval in Principle May look at 1-3 options for analysis in a business case	20%	P80 Risk	Cost risk & time risk
A2	Design Brief	Approval to proceed	10%	P50 Risk	Cost risk & time risk (incl. mitigation)

Large value capital expenditure projects would typically pass through the three stages of estimation. Higher volume and smaller value projects would typically pass through stages A1 and A2.

Estimates comprise a base cost estimate and a risk allowance. The risk allowance is developed with the aid of “risk workshops” and includes inherent risks and contingent risks. Uncertainty analysis is conducted on the expected ranges of all risks in order to arrive at the risk allowance of either P80 or P50 depending on the estimate level.

[11] P80 means that there is an 80% probability that the actual project cost will not exceed the estimate, including the assigned risk allowance.

To ensure accuracy, estimates undergo an increasing level of review as the estimate level increases. A1 estimates go through the Estimating Scoping Committee. A decision is made during the A1 stage on how the project will be sourced, either internally by Western Power or via one of the Western Power alliances.

The Estimating Scoping Committee consists of four standing members representing Estimating, Network Performance, Engineering and ELMS as well as the Project Manager for the particular project and, if sourced via alliance, a representative of the alliance. The Estimating Scoping Committee passes the estimate request to the Concept Estimator.

The A1 Estimate Report Template (DMS# 4273393) incorporates a quality assurance review process that is undertaken by the Concept Estimator on all inputs to the A1 estimation process.

The A2 estimate is conducted on the selected preferred option. The estimating centre requires specific inputs from the following groups.

- Construction
- ELMS
- Procurement
- Commissioning
- Alliance Contractors

These inputs undergo a quality assurance process that is undertaken by the estimating group according to the A2 Estimate Report Template (DMS# 4134159). A further review is conducted by the Project Manager before incorporation into the final business case.

4.2.6 Project Implementation

To avoid cost overruns during project implementation it is important that the project has been costed accurately (as discussed in the previous sections) and that costs are tightly controlled during construction. The latter requires project management and contract management processes to track and control costs and payments as the project is constructed or installed. Project implementation is undertaken by the Works and Resource Planning Branch and is subject to the Project Management Framework.

Works and Resource Planning Branch - Project Management Framework (DMS# 3358907v10)

The Project Management Framework for the Works and Resource Planning Branch sets out a detailed and comprehensive process for the planning, execution and closure of new facilities investment projects. The Project Management Framework contains a step-by-step guide to the methods, tools, systems and procedures available to project managers throughout all stages of the project implementation phase. By providing a comprehensive assembly of such elements and defining the use of a standardised but flexible approach, the Project Management Framework is intended to ensure that:

- all projects are conducted in a consistent, disciplined manner
- overall project risk to Western Power is reduced
- projects are completed on time and on budget.

The Project Management Framework covers all stages of project implementation, specifically:

- project initiation / start-up
- project planning
- project execution / controlling
- project completion / closure

Western Power has considerable additional governance arrangements that cover project management including policies, procedures, systems and guidelines as listed:

- Distribution Project Management Strategy and Procedures (DMS# 1594628)
- Project Management Methodology (DMS# 3182965)
- Project Management Handbook Issue 1 (DMS# 611207 & 612677)
- Project Management Procedures (DMS# 905702)

4.3 SPECIFIC REQUIREMENTS OF PART A

The Electricity Networks Access Code stipulates in Part (a) of the NFIT that for new facilities investment to be considered not to exceed the amount that would be invested by a service provider efficiently minimising costs, consideration should be given (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.

Therefore, these required considerations form specific criteria for efficient investment in addition to the general criteria discussed above. These specific criteria are considered below.

4.3.1 Lowest Sustainable Cost

For both transmission and distribution NFI, the economic life of network assets means that the planning of growth projects necessarily covers a “reasonable period” of time. These factors in turn drive the time period over which the financial modelling of the project is conducted and mean that a forecast of sales over a “reasonable period” will be included in the selection of the least-cost option as required by Part (a) of the test.

4.3.2 Economies of scale and scope

The consideration of economies of scale and scope form part of the natural project development process for growth NFI.

Economies of scope can be considered as the alignment or aggregation of otherwise separate projects for the purpose of cost efficiency. Either of these actions will impact the scope of projects as compared to the case where they are considered separately.

One of the key methods by which economies of scope are realised is in the prudent and efficient coordination of augmentation and replacement works. As discussed in Section 4.1 this function is formalised in Western Power's range of strategic planning activities (such as the Strategic Asset Management Plan and the Transmission and Distribution Annual Planning Report) and is facilitated by specific initiatives such as the internal relation plans. The strategic planning documents aim to bring together the various needs of the network over a reasonable length time period for the purpose of identifying and realising efficiencies.

The long term view that is taken for the planning of transmission growth projects allows that most upcoming projects are known well in advance. This gives the opportunity to identify projects that can be aligned or combined to create an economy of scope or scale that is of overall benefit to the project.

An example of this would be for a substation project that has two distinct stages. By bringing forward the site preparation works of Stage 2 and conducting them at the same time as Stage 1, an economy of scope can be realised through the avoidance of a second mobilisation and demobilisation cost for the relevant contractors. This substation preparation work can be contrasted to the procurement and construction of the main substation items such as the transformer. In the case of the latter, the cost is significant and relatively minor economies of scope exist. This means that it is not of overall benefit to bring forward the entire second stage of the substation to coincide with the first stage.

A key method by which economies of scope are realised for distribution NFI is via the aggregation of many small discrete projects into larger programs of work. This allows the work program to be assigned and implemented as one package for the benefit of cost reduction through lower administrative, management and mobilisation costs.

Economies of scale can be considered as the purchasing of multiple assets or investment in labour across multiple similar activities for the purpose of gaining efficiencies and reducing per unit costs. An economy of scale may be realised at the design phase by the use of standardised components or at least the alignment of component types across multiple projects. An economy of scale may be realised at the procurement phase by the alignment of purchasing for multiple projects under one agreement with a supplier.

4.3.3 Increments in which capacity may be added

When considering the requirement to efficiently minimise costs, regard should be had to the restrictions on the volume of capacity that can be added. It is common that the perfect size component in terms of capacity is not available as a standard item. Therefore, from a theoretical basis, the capacity of a new facility may be greater than required and could therefore be considered less than fully efficient. However from a practical perspective, the larger capacity may be the only size available, or the custom manufacture of components to create the theoretical perfect size would be cost-prohibitive and therefore not economically efficient.

In reality, the increments in which capacity may be added are sufficient to avoid problems of inefficiency. The steady demand growth means that the full utilisation of many new facilities will be realised within planning horizons.

4.4 CONCLUSION

It is concluded that Western Power's business processes and related governance arrangements, as described in Section 4 of this report, act to drive efficient investment and to facilitate investment decision making and outcomes that are aligned with the requirements of Part (a) of the New Facilities Investment Test.

5. NEW FACILITIES INVESTMENT TEST - PART (B)

This section of the report addresses Part (b) of the NFIT separately for each regulatory category of expenditure. Western Power has determined that the new facilities investment in all regulatory categories meets the requirements of this part of the test. The following table summarises the leg of Part (b) of the NFIT that each category meets.

Table 5-1 NFIT Part (b) leg satisfied by each Regulatory Category

NFIT part (b)	(i) incl 6.56 Revenue	(ii) Net benefits	(iii) Reliability
CE Capacity Expansion (Transmission & Distribution)			✓
CA Customer Access (Transmission & Distribution)	✓		
GD Generation Driven (Transmission)	✓		
Gifted Assets (Distribution)	✓		

5.1 CAPACITY EXPANSION

Capacity Expansion projects relate to increasing the capacity of the network infrastructure to cater for the additional load imposed by the connection of new small customers and the intrinsic load growth of existing customers, having consideration of the overall system growth and diversified load forecasts.

New facilities investment in Capacity Expansion projects meets leg (iii) of Part (b) of the NFIT. Leg (iii) is commonly referred to as the "safety and reliability leg" and is repeated below:

> *The new facility is necessary to maintain the safety or reliability of the covered network or its ability to provide contracted covered services.*

Western Power is obliged to operate the network in accordance with the technical rules. Chapter 12 of the Code requires Western Power to publish the technical rules. These rules, as approved by the ERA, detail the technical requirements to be met by Western Power on the transmission and distribution systems and by other users who connect to these systems. In addition, the planning criteria to be applied to the transmission and distribution systems are also contained within these rules. In essence, the technical rules specify the technical standards consistent with good electricity industry practice required to maintain safe and reliable development and operation of the network.

Attempting to meet an increasing forecast load without undertaking suitable Capacity Expansion NFI is likely to have negative consequences in terms of Western Power's ability to operate the network in accordance with the technical rules. In particular, as the peak load rises over time and Capacity Expansion NFI is not undertaken, the load will reach a point where equipment ratings will be breached, the technical rules will not be met and the safety, reliability and quality of supply of the network will be compromised.

Consequently, Capacity Expansion NFI is primarily required to maintain the safety and reliability of the covered network given the projected load forecasts in accordance with the technical rules. Western Power is obliged to maintain and operate the network in

accordance with the technical rules as approved by the Authority and Capacity Expansion NFI is required to enable Western Power to meet these obligations. All Capacity Expansion NFI in the first Access Arrangement period is consequently considered to meet leg (iii) of Part (b) of the NFIT.

It is also relevant to discuss the application to Capacity Expansion NFI of the other legs of Part (b) of the NFIT.

Leg (i) of Part (b) of the NFIT is commonly referred to as the "incremental revenue leg" and is repeated below:

> *(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;.*

By their nature of allowing increased flows of electricity, Capacity Expansion projects will usually generate anticipated incremental revenue. This revenue will generally be sufficient to recover the NFI, however, it is not always possible to definitively determine incremental revenue for Capacity Expansion projects. For example, in the case of reinforcements to the meshed transmission network it can be difficult to determine the exact increments of capacity which have been added at particular transmission nodes and consequently which nodal prices should be applied to the new capacity, and also how future prices should be established.

Where possible, incremental revenue for a project will be determined in order to provide supplementary justification for a project. The exception to this is where the expected effort is disproportionate to the expected incremental revenue. Generating incremental revenue is not a driving rationale for undertaking Capacity Expansion NFI. Therefore, Western Power does not always calculate the anticipated incremental revenue for Capacity Expansion projects. The requirement to calculate anticipated incremental revenue is assessed on a project-by-project basis. Western Power has confirmed that none of the Capacity Expansion NFI projects in the first Access Arrangement period have been justified on the basis of anticipated incremental revenue.

In summary, the incremental revenue leg (i) of Part (b) of the NFIT is generally not used to assess Capacity Expansion NFI for the following reasons:

- the generation of anticipated incremental revenue is not the principal purpose for investment in Capacity Expansion assets; and
- the principal purpose of Capacity Expansion NFI aligns with the reliability leg (iii) of Part (b) of the NFIT.

Leg (ii) of Part (b) of the NFIT is commonly referred to as the "net benefits leg" and is repeated below:

> *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.*

Capacity Expansion projects are generally not initiated by Western Power for the purpose of providing a net benefit as defined under the Code. However, where a Capacity Expansion project can be quantitatively determined to provide a net benefit to other users on the network (by way of facilitating the connection of cheaper generation to the WEM,

for example), then the project may be warranted. Such a project would normally be subject it to the regulatory test under the Code, and if the project passed the regulatory test and the overall net benefit in net present value terms is positive, it could be justified under leg (ii) of Part (b) of the NFIT. Unfortunately, the quantification of net benefit as defined in the Code is not always straightforward or even possible sometimes given the structure of the WEM in WA. Therefore, Western Power does not always calculate the net benefit as defined under the Code for Capacity Expansion projects. The requirement to calculate net benefit is assessed on a project-by-project basis, and no Capacity Expansion NFI in the first Access Arrangement period has been justified on the basis of net benefit.

The net benefits leg (ii) of Part (b) of the NFIT is therefore generally not used to pass Capacity Expansion NFI.

5.2 CUSTOMER ACCESS

Customer Access projects relate to the connection of new customers to the network.[12] Customer Access NFI is subject to Western Power's Capital Contribution Policy (DMS# 3522687v1).

New facilities investment in Customer Access projects typically includes a portion of NFI that is funded by Western Power and meets leg (i) of Part (b) of the NFIT, commonly referred to as the "incremental revenue leg".

The remainder of the NFI in a Customer Access project is funded by the customer and may be added to the capital base via clause 6.56 of the Code. This clause is repeated below:

> *Despite section 6.52, if—*
>
> *(a) a capital contribution has been, or is expected to be, provided to the service provider; and*
>
> *(b) the new facilities investment in respect of which the capital contribution is made meets the requirements of section 6.52(a); and*
>
> *(c) an amount in respect of the capital contribution is deducted from the service provider's target revenue,*
>
> *then an amount of new facilities investment in respect of the capital contribution may be added to the capital base*

The division of NFI for a Customer Access project into the portion funded by Western Power and the portion funded by the customer is governed by Western Power's Capital Contributions Policy.

The Capital Contributions policy states that a customer is required to pay a contribution:

- for work which does not satisfy the NFIT
- for work in accordance with Appendix 8 of the Code.

In essence, Western Power funds the portion of the project cost that will be recovered by anticipated incremental revenue plus any works undertaken by Western Power beyond

[12] Source: Regulatory Categories and Work Type Definitions (DMS# 4212488v5)

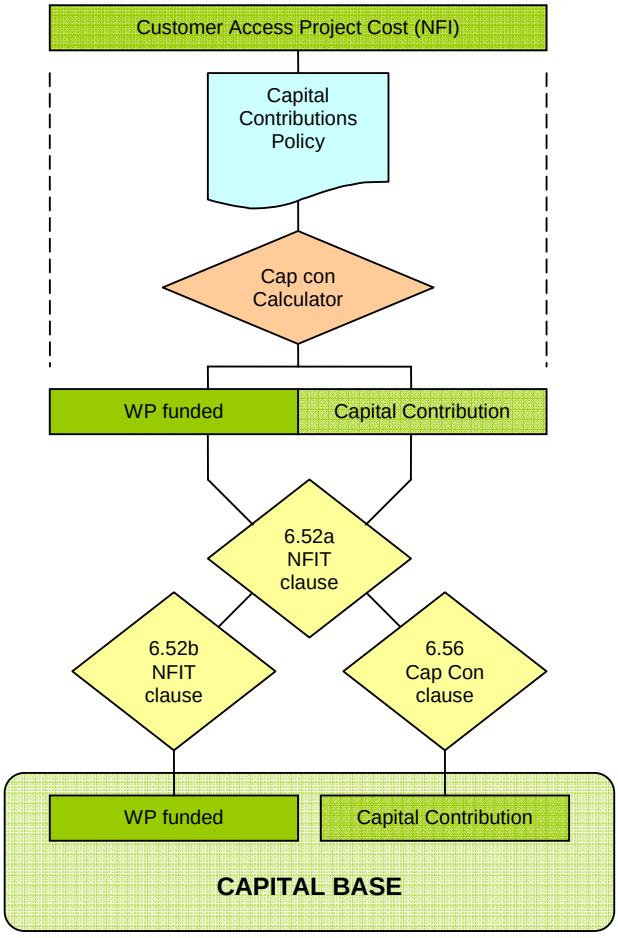
the minimum necessary works, plus an amount equal to any savings that the works will generate for Western Power, plus the amount that would pass the NFIT Parts (b)(ii) and (b)(iii). All calculations are done on a net present value basis and include adjustments for required variations to other scheduled Western Power work. This calculation is performed by Western Power's software called the "Capital Contribution Calculator".

In determining the portion of the works which may be subject to a capital contribution, Western Power first determines the relevant network development plans such as those published in the Annual Planning Report and the associated Capacity Expansion NFI. Any additional work and investment which is subsequently required to facilitate the connection of new specific identifiable customers may be subject to a capital contribution in accordance with the capital contributions policy. The contribution is then calculated as described above.

Generally, the amount funded by Western Power corresponds to the proportion of the project that meets the requirements of the NFIT. The remainder of the NFI is funded by the customer as a capital contribution and may be added to the capital base via clause 6.56. The Capital Contribution policy also specifically states that connection assets are fully funded by the applicant. In this case, the NFI in the connection asset may be added to the capital base via clause 6.56.

This process is illustrated graphically in the following flow chart.

Figure 5-1 Flow of Customer Access NFI to the capital base via the Capital Contributions Policy



It is also relevant to discuss the application of the other legs of Part (b) of the NFIT.

Customer Access projects are not generally assessed against leg (ii) of Part (b) of the NFIT as they do not generally provide a net benefit to the covered network that would justify the approval of a higher reference tariff. This is because the investment is for the benefit of a specific user only. However, where a Customer Access project can be quantitatively determined to provide a net benefit to other users on the network, as defined under the Code[13], then that net benefit would be credited to the customer when determining the capital contribution.

Customer Access projects are not generally assessed against leg (iii) of Part (b) of the NFIT. However, where a customer-driven network augmentation does provide a tangible and quantifiable benefit to other users of the network in terms of safety and reliability, by way of improving network reliability and reducing SAIDI, for example, then that tangible benefit would be credited to the customer when determining the capital contribution.

[13] For example, by way of demand management which provides increments of capacity and energy to the WEM at a lower cost than would otherwise be available.

5.3 GENERATION DRIVEN

Generation Driven projects relate to the connection of new generators to the network. Generation Driven NFI is treated similarly to Customer Access NFI and is subject to Western Power's Capital Contribution Policy (DMS# 3522687v1). See Section 5.2 on Customer Access for further information on the application of the Capital Contribution Policy and the NFIT to this type of investment.

5.4 GIFTED ASSETS

Gifted Assets refers to distribution network assets that are fully funded by another party. A specific example is the electrical reticulation installed at new subdivisions. According to Appendix 8 of the AAI, "Capital contributions policy - Demonstration of Code compliance", assets of this nature are to be fully funded by the user, regardless of whether the asset may satisfy part or all of the NFIT.

Gifted Assets are treated as having attracted a 100% capital contribution and may be added to the capital base via clause 6.56 of the Code. Therefore the only interaction with the NFIT is the requirement in clause 6.56 (b) that the NFI meets part (a) of the NFIT.

6. PROJECT DOCUMENTATION SAMPLING

6.1 INTRODUCTION

This section of the report uses case studies of project documentation to demonstrate that the Western Power governance and procedures drive outcomes in terms of new facilities investment that are consistent with the NFIT.

The criteria for selecting the sampled projects are:

- **Project type:** It is intended to cover the majority of regulatory categories that comprise "Growth" investment.
- **Project materiality:** The sampling focuses on significant projects.
- **Project timing:** Only projects that are considered to have been committed during the AA1 period are included. Given that most larger projects have an extended planning, design and initiation stage before major capital costs are incurred and before the project would be considered committed, a low level of expenditure on the project prior to June 2006 has been allowed. All sampled projects have less than 2% of total project cost incurred prior to June 2006.

The assessment of project documentation focusses on the business case as the key document that summarises the rationale, design and costs of a proposed project.

6.2 CAPACITY EXPANSION

This section assesses Capacity Expansion projects against the NFIT.

Kewdale – Establish New Substation (DMS# 2759359v2)

The driver for this project is Capacity Expansion. Actual and forecast expenditure during the AA1 period on "Kewdale – Establish New Substation" is presented in Table 6-1. Prior to the AA1 period, the total expenditure associated with this project was $0.18 million. Given that this level of expenditure represents less than 2% of the project total cost, it is not considered that Western Power had "committed" to the project prior to the commencement of the AA1 period. Therefore, capital expenditure on this project is expected to be subject to the NFIT.

Table 6-1 Expenditure on "Kewdale - Establish New Substation"

	Business Case Total Cost	Total AA1	06-07 actual	07-08 actual	08-09 forecast (AWP)
$m	10.13	10.46	0.38	5.07	5.39

NFIT Part (a)

This project has been proposed in response to load growth at Welshpool substation that is forecast to reach capacity by 2009. The general solution is to expand capacity to supply the area serviced by Welshpool substation. The development of the technical options for this solution has been conducted according to Western Power's standards processes. Four options are presented in the business case:

- Option 1 - Establish Kewdale substation
- Option 2 - Convert Victoria Park to 132/22 kV
- Option 3 - Transfer Load to surrounding substations
- Option 4 - Do nothing

Option 4 does not meet the planning criteria and is therefore not a viable option. Option 3 was determined to be unfeasible due to insufficient capacity at surrounding substations. Option 2 is technically feasible but was estimated to cost $5.3 million more than Option 1. Therefore option 1 was selected as the technically feasible option that satisfied the planning criteria at lowest net present cost.

The evaluation of project costs has been conducted according to Western Power's standard estimating procedures as described in Section 4. The implementation of the project including the procurement of labour and materials has been conducted in line with Western Power's standards procedures that are outlined in Section 4. These procedures are considered to provide for least-cost procurement and cost-minimisation during construction.

NFIT Part (b)

As outlined in Section 5, Capacity Expansion Growth Transmission investment is considered to pass leg (iii), the safety and reliability leg, of Part b) of the NFIT. This justification fits with "Kewdale – Establish New Substation".

(i) Incremental Revenue: It is likely that the project will generate anticipated incremental revenue as it is designed to service a general load growth in the area of 3.5% (based on Welshpool load growth history). However, the generation of anticipated incremental revenue is not the driving rationale behind the project and it has not been determined whether the anticipated incremental revenue would be sufficient to cover the new facilities investment. Therefore, leg (i) of Part (b) of the NFIT is not used to justify the project.

(ii) Net benefits: It has not been determined whether the project would offer net benefits to the network that would justify higher tariffs. Therefore, leg (ii) of Part (b) of the NFIT is not used to justify the project.

(iii) Safety and Reliability: The analysis of Option 4 – "Do nothing", forecasts that if the project were not undertaken, load shedding at times of peak load may be required in the near future which would not meet the planning criteria or other technical rules. Therefore, the project is required in order to maintain the operation of the network within the technical rules and is therefore aligned with the reliability leg (iii) of Part (b) of the NFIT. The project in its entirety is required for this purpose and therefore the full value of the project new facilities investment meets part (b) of the NFIT.

New facilities investment in the AA1 period on "Kewdale – Establish New Substation" has been determined to meet the requirements of both Parts (a) and (b) of the NFIT.

Joondalup – Establish New Substation (DMS# 2695480v1)

The driver for this project is Capacity Expansion. Actual and forecast expenditure during the AA1 period on "Joondalup – Establish New Substation" is presented in Table 6-2.

Table 6-2 Expenditure on "Joondalup - Establish New Substation"

	Business Case Total Cost	Total AA1	06-07 actual	07-08 actual	08-09 forecast (AWP)
$m	6.24	2.0	0.00	0.01	1.99

NFIT Part (a)

This project has been proposed in response to rapid load growth at Wanneroo and Mullaloo substations that are both forecast to reach capacity by the summer of 2009/10. The general solution is to expand capacity to supply the area serviced by Wanneroo and Mullaloo substations. The development of the technical options for this solution has been conducted according to Western Power's standards procedures. Four options are presented in the business case:

- Option 1 - Establish Joondalup substation
- Option 2 – Bring forward the establishment of Hocking Substation
- Option 3 - Transfer Load to surrounding substations
- Option 4 - Do nothing

Option 4 does not meet the planning criteria and is therefore not a viable option. Option 3 was determined to be unfeasible due to insufficient capacity at surrounding substations. Option 2 is technically feasible but was estimated to cost more in net present terms than Option 1, despite requiring lower initial capital investment. Therefore option 1 was selected as the technically feasible option that satisfied the planning criteria at lowest net present cost.

NFIT Part (b)

As outlined in Section 5, Capacity Expansion Growth Distribution investment is considered to pass leg (iii), the reliability leg, of Part b) of the NFIT. This analysis is consistent with "Joondalup – Establish New Substation".

(iv) Incremental Revenue: It is likely that the project will generate anticipated incremental revenue as it is designed to service a general load growth in the service area. However, the generation of anticipated incremental revenue is not the driving rationale behind the project and it has not been determined whether the anticipated incremental revenue would be sufficient to cover the new facilities investment. Therefore, leg (i) of Part (b) of the NFIT is not used to justify the project.

(v) Net benefits: It has not been determined whether the project would offer net benefits to the network that would justify higher tariffs. Therefore, leg (ii) of Part (b) of the NFIT is not used to justify the project.

(vi) Safety and Reliability: The analysis of Option 4 – "Do nothing", forecasts that if the project were not undertaken, load shedding at times of peak load may be required in the near future which would not meet the planning criteria or other technical rules. Therefore, the project is required in order to maintain the operation of the network within the technical rules and is therefore aligned with the reliability leg (iii) of Part (b) of the NFIT. The project in its entirety is required for this purpose and therefore the full value of the project new facilities investment meets part (b) of the NFIT.

New facilities investment in the AA1 period on "Joondalup – Establish New Substation" has been determined to fully meet the requirements of both Parts (a) and (b) of the NFIT.

6.3 GENERATION DRIVEN

This section assesses a Generation Driven project against the NFIT.

Bluewaters Substation Stage 2 - Reg Work (DMS# 3601968v4)

The driver for this project is Generation Driven. Actual and forecast expenditure during the AA1 period on "Bluewaters Substation Stage 2" is presented in Table 6-3. Prior to the AA1 period, this project had $16,000 expenditure. Given that this level of expenditure represents less than 1% of the project total cost, it is not considered that Western Power had "committed" to the project prior to the commencement of the AA1 period. Therefore, capital expenditure on this project is expected to be subject to the NFIT.

Table 6-3 Expenditure on "Bluewaters Substation Stage 2 - Reg Work"

	Business Case Total Cost	Total AA1	06-07 actual	07-08 actual	08-09 forecast (AWP)
$m	2.77	2.94	0.01	0.82	2.11

NFIT 6.52 a) Efficiency test

Considering the requirements of Clause 6.52(a)(i), this project provides a good example of the incorporation of economies of scope into the planning and implementation process.

The project has been proposed in order to realise an economy of scope through combining two stages of switchyard work. Bluewater Power Station is being developed in stages, each of which requires regulated switchyard works to enable connection to the SWIS. The timing of the power station stages had led to the planning of two separate switchyard projects. By bringing forward the Stage 2 switchyard works and conducting them at the same time as Stage 1, an economy of scope can be realised through the avoidance of a second mobilisation and demobilisation cost for the contractors as well as efficiencies in Western Power's internal design and project management effort.

NFIT Part (b)

As outlined in Section 5, Generation Driven investment is considered to pass leg (i), the incremental revenue leg, of Part b) of the NFIT. This justification fits with "Bluewaters Substation Stage 2".

(i) Incremental Revenue: It is expected that the project will generate anticipated incremental revenue as it is designed to enable connection of a new generator to the SWIS. Anticipated incremental revenue has been included in the calculation of the customer contribution that this project attracts. Therefore the portion of the NFI that will be funded by Western Power is expected to be recovered by the incremental revenue that the project will generate.

(ii) Net benefits: It has not been determined whether the project would offer net benefits to the network that would justify higher tariffs. Therefore, leg (ii) of Part (b) of the NFIT is not used to justify the project.

(iii) Safety and Reliability: This project is not required on the grounds of safety or reliability, therefore leg (iii) of Part (b) of the NFIT is not used to justify the new facilities investment.

New facilities investment in the AA1 period on "Bluewaters Substation Stage 2" has been determined to meet the requirements of both Parts (a) and (b) of the NFIT.

6.4 CUSTOMER ACCESS

This section assesses a Customer Access project against the NFIT.

Binningup Desalination Plant (DMS# 4883755)

The driver for this project is Customer Access. Actual and forecast expenditure during the AA1 period on "Binningup Desalination Plant" is presented in Table 6-4. Prior to the AA1 period, this project had less than $10,000 expenditure, so it is not considered that Western Power had "committed" to the project prior to the commencement of the AA1 period. Therefore, capital expenditure on this project is expected to be subject to the NFIT.

Table 6-4 Expenditure on "Binningup Desalination Plant"

	Business Case Total Cost	Total AA1	06-07 actual	07-08 actual	08-09 forecast (AWP)
$m	45.9	6.04	0.00	0.04	6.0

NFIT 6.52 a) Efficiency test

This project has been proposed in response to the plans by the Water Corporation to establish a desalination plant with an initial demand of 25MW by July 2010. This is later expected to increase to 55MW. The desalination plant requires a 132kV supply. Western Power has presented 5 options in the business case:

- Option 1 - Install a second 330/132kV transformer and new 132kV terminal yard
- Option 2 - Install a 90MVAr capacitor bank at the Kemerton Terminal
- Option 3 – Uprate existing 132kV lines
- Option 4 - Do nothing
- Option 5 – On site generation

Option 1 was selected as the lowest sustainable cost option. Option 2 had a lower initial cost but was only forecast to provide sufficient capacity until 2013/14, after which time, further works would be required and the sustainable cost would be higher than for Option 1. Options 3 and 5 were also estimated to be of higher cost than option 1.

NFIT Part (b)

As outlined in Section 5, Customer Access Transmission investment is considered to pass leg (i), the incremental revenue leg, of Part b) of the NFIT or Clause 6.56. In this project, there are two elements, each with a different justification under Part (b). The dedicated connection asset (132kV line) for the desalination plant is subject to a capital contribution and is considered under leg (i) and Clause 6.56. The shared asset

(transformer and switch yard) which is not subject to a capital contribution is considered under leg (iii).

A capital contribution for the dedicated connection asset has been calculated as equal to the total cost of the asset in accordance with Western Power's Capital Contributions Policy. This Capital Contribution of $16.8 million may be added to the capital base via Clause 6.56, rather than the NFIT Part (b). No capital contribution is due from the Water Corporation for the shared assets which have a total cost of $29.1 million.

(i) Incremental Revenue: The project is expected to result in anticipated incremental revenue as it allows for the connection of specific large consumers as well serving general load growth. For the dedicated connection asset, the capital contribution has been calculated as equal to the total cost of the asset, therefore there is no remaining Western Power funded element to pass through the NFIT Part (b). The purpose of the shared asset is to provide the required capacity to enable the reliability of the network to be maintained under the increased load of the desalination plant, other large consumers and general load growth. Anticipated incremental revenue is therefore not the driver behind the project is leg (i) is not used to pass this investment.

(ii) Net benefits: It has not been determined whether the project would offer net benefits to the network that would justify higher tariffs. Therefore, leg (ii) of Part (b) of the NFIT is not used to justify the project investment.

(iii) Safety and Reliability: The shared assets portion of the project is required in order to reliably deliver the capacity required by the desalination plant, other large consumers and general load growth. The desalination plant load of 25MW will be served until May 2011 without the shared asset reinforcement, but only as a curtailable supply. This situation does not offer a level of reliability required by the Water Corporation in the long term and indicates that the reinforcement works incorporating the transformer and switch yard are required on the grounds of maintaining the reliability of the network. Although the desalination plant will only take some of the capacity of the reinforcement, the remaining capacity will be used by other large consumers and general load growth. Therefore, the full investment in the shared asset meets part (b) of the NFIT.

New facilities investment in the AA1 period on "Binningup Desalination Plant" has been determined to meet the requirements of both Parts (a) and (b) of the NFIT.

6.5 CONCLUSIONS

The sampling of a range of business case documentation from various regulatory categories within the 'Growth' umbrella has demonstrated consistent outcomes in terms of new facilities investment that meets the requirements of the NFIT.

Part (a) of the NFIT that requires "efficient minimisation of costs" was consistently met through the development and analysis of multiple options and the selection of the least cost option. Examples have been discussed of the incorporation of economies of scope and the consideration of minimising the sustainable cost of providing network services rather than focussing on short term cost minimisation.

The framework set up in Section 5 identified which leg of Part (b) of the NFIT that investment in a particular regulatory category satisfies. The project sampling supports this framework by providing specific case studies that confirm that Part (b) of the NFIT is satisfied in each case. In one example, a project contained two elements that each passed Part (b) via a separate leg.

7. CONCLUSIONS

The assessment undertaken by PB, as set out in this report, demonstrates that Western Power undertakes investment in growth related new facilities in a manner that is consistent with the requirements of the new facilities investment test (NFIT) as defined in clause 6.52 of Electricity Networks Access Code (2004) ("the Code"). Through this review, PB has determined that Western Power has in place suitable governance and procedures to drive investment that is aligned with the NFIT. It has been demonstrated that a sample of Western Power's actual and forecast new facilities investment during the AA1 period (July 2006 to June 2009) meets the requirements of the new facilities investment test.

Western Power engaged consultants Harding-Katz to provide advice on the regulatory categories to which the NFIT should be applied. Harding-Katz considers that the regulatory framework under which Western Power operates provides a natural incentive to invest efficiently in regulatory categories to which the Investment Adjustment Mechanism does not apply. The Investment Adjustment Mechanism applies to growth related networks investment and it is concluded that the NFIT should therefore be applied to these regulatory categories. PB agrees with this conclusion and has assessed the investment in growth related regulatory categories against the requirements of the NFIT.

The value of all new facilities investment in the AA1 period is presented in Table 7-1.

Table 7-1 New facilities investment during the AA1 period (actual and forecast)

Investment Group	Value [$m]			
	06/07 Actual	07/08 Actual	08/09 Forecast	Total
1 Growth Transmission	249.0	267.5	375.6	892.1
2 Growth Distribution	278.9	271.2	315.4	865.5
3 Non Growth Networks	137.5	179.1	274.4	591.0
4 Corporate	36.1	57.4	61.1	154.6
TOTAL INVESTMENT	**701.4**	**775.2**	**1,026.5**	**2,503.1**

Part (a) of the NFIT essentially requires that new facilities investment is efficient and prudent. Part (b) of the NFIT requires that the investment satisfies at least one of three legs. In particular the investment must either generate anticipated incremental revenue that is expected to cover the investment cost (i), or provide net benefits to the covered network that would justify higher tariffs (ii), or be necessary to maintain the safety, reliability or ability of the network to provide contracted covered services. Both Parts (a) and (b) must be passed in order for new facilities investment to be rolled into the capital base.

For the purposes of applying the NFIT, AA1 new facilities investment was aggregated into groups based on regulatory categories. This approach is contemplated by the ERA's issues paper and allows an efficient assessment process to be undertaken as compared to a project by project assessment. The assessment was conducted in turn for both Parts (a) and (b) of the NFIT.

NFIT Part (a)

The assessment of Western Power's AA1 new facilities investment against Part (a) of the NFIT was structured in three stages.

The first stage has involved a review of the strategic direction of Western Power, as set by its high level governance arrangements and processes. Western Power's high level governance was found to be aligned with the intention of Part (a) of the NFIT that requires investment to be efficient. Efficiency is one of the three key corporate objectives of Western Power to be "safe, reliable and efficient". This direction was found to be supported by a corporate focus on risk management and optimisation. A range of strategic planning processes were identified and found to form an important high-level function to maximise the efficiency of Western Power's planned investment. These processes such as the Strategic Asset Management Plan and the Annual Planning Report actively work to draw together the separate areas of the company, provide an overview of investment for management, provide stakeholder information and facilitate stakeholder feedback.

Internal processes such as the delegated financial authorities and the internal relationship plans were also found to support rigour in the investment decision making process through the provision of a framework for accountabilities and the facilitation of communication between technical areas that have overlapping interests in assets and investment. The Works Program is a particular process that was found to play a key role in governing the efficiency of Western Power's investment. The Works Program provides a high level structured framework of continuous scrutiny and approvals of investment by a committee.

Efficient resourcing of Western Power's new facilities investment requirements was found to be driven by a resourcing strategy that comprised resource planning and a strategic delivery framework. The strategic delivery framework assesses a range of delivery models in order to minimise resource constraints and maximise the efficiency of investment resourcing. Internal delivery, alliance partners, open tendering, preferred vendors and alternate mechanisms are all considered. The resourcing strategy also includes considerations of economies of scale, as required by sub-clause (i) of Part (a) of the NFIT.

The second stage of the AA1 assessment of new facilities investment against Part (a) of the NFIT comprised review of Western Power's operational procedures that support the high level governance arrangements. These operational procedures work towards producing efficient investment outcomes and were found to align with the requirements of the NFIT Part (a).

The Business Case Process is designed to facilitate commercially disciplined decision making and was found to be a key tool in driving the efficiency of investment. The Business Case summarises the assessment of options, minimisation of costs and tracks the managerial approval for the associated investment.

Engineering planning processes for transmission and distribution have been established within Western Power to ensure that an identified need for a change to the network is addressed by the best option at the right time and in accordance with the technical rules and the planning criteria. Western Power follows these planning processes to ensure that the most efficient technical options are developed. The planning process and development of multiple options includes the specific requirements of Part (a) of the NFIT that are detailed in the sub-clauses (i) and (ii) including economies of scope and the consideration of reasonable time periods in order to provide the lowest sustainable cost rather the lowest immediate cost.

A further key element in process to enable the least cost technical option to be selected is the accuracy of project estimation. Western Power has a detailed estimation procedure that prescribes the required accuracy of estimates at various stages of project development and is backed up by a framework involving a dedicated committee. This process was found to be rigorous and suitable for the provision of accurate estimates from which sound commercial decisions can be based.

The final stage of project development is implementation. Backed up by the high level strategies surrounding resourcing, Western Power's project implementation function is guided by a detailed project management framework. This framework incorporates cost control throughout the project construction phase to ensure that efficiency of investment is maintained.

The third stage of the AA1 assessment of new facilities investment against Part (a) of the NFIT comprised the sampling of documentation from projects across the range of relevant regulatory categories. This assessment showed evidence that Western Power's governance and procedures regarding efficient investment have lead to consistent project outcomes that meet the requirements of Part (a) of the NFIT.

NFIT Part (b)

The assessment of Western Power's AA1 new facilities investment against Part (b) of the NFIT was conducted for each regulatory category. Investment in each regulatory category was found to meet a leg of Part (b) of the NFIT.

Investment in transmission and distribution Capacity Expansion projects was found to be necessary in order to maintain the reliability of the network in the face of increasing loads. If the Capacity Expansion investments were not undertaken, the probability of breaches to the Technical Rules increases and it would not be possible to serve the increasing load reliably.

Customer Access projects and Generation Driven projects cover the dedicated assets and augmentation work required to connect the customer or generator to the network. These projects are subject to Western Power's Capital Contribution Policy and may attract a Capital Contribution required to be paid by the connecting party. The value of the Capital Contribution is calculated by Western Power and does not include the value of anticipated incremental revenue that the project is expected to generate. Accordingly, the portion of the new facilities investment that is not funded by the customer as a Capital Contribution will be recovered by the project's anticipated incremental revenue and will meet leg (i) of Part (b) of the NFIT.

The portion of new facilities investment in Customer Access and Generation Driven funded by the customer as a Capital Contribution may be added to the capital base via Clause 6.56 of the Code, rather than via Part (b) of the NFIT. Clause 6.56 still requires that the investment meet the requirements of Part (a) of the NFIT. Gifted Assets are treated as having a full Capital Contribution and are also added to the Capital Base via Clause 6.56.

The sampling of project documentation supported the analytical framework described above by demonstrating that Part (b) of the NFIT was satisfied in each case.