Murraylink Transmission Company Pty Ltd

Murraylink Revenue Proposal

Effective
July 2013 to June 2023

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Murraylink Proposal FINAL.docx

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Glossary

Abbreviation	Meaning
AARR	Aggregate Annual Revenue Requirement
ABS	Australian Bureau of Statistics
AC	Alternating Current
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AWOTE	Average Weekly Ordinary Time Earnings
CGS	Commonwealth Government Securities
DC	Direct Current
DNSP	Distribution Network Provider
DRP	Debt Risk Premium
EBSS	Efficiency Benefit Sharing Scheme
EGWWS	Electricity, Gas, Water and Waste Services
EII	Energy Infrastructure Investments
HVDC	High Voltage Direct Current
LPI	Labour Price Index
MAR	Maximum Allowed Revenue
NEM	National Electricity Market
NER	National Electricity Rules
NPV	Net Present Value
Proposal	Murraylink Revenue Proposal
PTRM	AER Post Tax Revenue Model
RAB	Regulatory Asset Base
RIT	Regulatory Investment Test
RFM	(Asset Base) Roll Forward Model
Rules	National Electricity Rules
STPIS	Service Target Performance Incentive Scheme
TNSP	Transmission Network Service Provider
WACC	Weighted Average Cost of Capital

Executive Summary

This Revenue Proposal for the Murraylink transmission interconnector (Murraylink) is submitted by Murraylink Transmission Company Pty Limited, on behalf of Energy Infrastructure Investments Pty Limited.

Murraylink is a 180 km, HVDC 220 MW transmission link between Red Cliffs in Victoria and Berri in South Australia. It can control power transfers to the limit of its capacity, in both directions, between the Victorian and South Australian transmission networks. The link is dispatched by AEMO, in similar manner to a generator, to control flows between the NSW and South Australian regions of the National Electricity Market (NEM) and thereby minimise the costs of generation in the NEM.

Murraylink was originally built to operate as a market network service provider, trading between the two regions. In October 2003, the ACCC determined that Murraylink would be reclassified as providing a prescribed transmission service. The ACCC determined Murraylink's maximum allowable revenues for the nominal 10-year period until 30 June 2013. This revenue Proposal is for a second 10-year regulatory control period, from 1 July 2013 to 30 June 2023.

The demand for Murraylink's standard control services arises from the need for energy to be dispatched between the NSW and South Australian regions, in accordance with AEMO's requirements. The need for interconnection capacity is increasing, to match the expansion in renewable generation in South Australia. This will require Murraylink's maximum available capacity to be maintained with a high level of availability.

This Revenue Proposal presents Murraylink's revenue requirement to continue to provide the same level of prescribed transmission services, for the second regulatory control period.

At the time of its commissioning, Murraylink represented cutting-edge 'HVDC Light' technology. The Direct Current (DC) convertor stations were connected by the longest underground cable in the world. Whilst there have been a number of more recent DC transmission developments throughout the world, this type of equipment remains highly specialised. Compared with the static elements that comprise the great majority of conventional transmission networks, this equipment is complex and technologically advanced.

The maximum capacity available from the Murraylink interconnection is frequently limited by the capacity of the conventional transmission networks to which the link is connected, particularly when elements of those networks are constrained or out of service.

There is the potential for Murraylink to provide greater benefits to the market, if its capability were more fully utilised than at present. At modest cost, more sophisticated control systems could optimise the flow and voltage compensation provided by Murraylink. The link currently relies on synchronising signals from the networks to which it is connected, but with a modified control system, the link could also provide black start support to the two adjacent regions or to islanded sub-

systems. These proposals would not affect the basic configuration or maximum capacity of the link.

As these augmentations are expected to become economic during the 2013-23 regulatory control period, Murraylink has included projects to upgrade the utilisation of the link in this Proposal.

Murraylink has also identified a sequence of projects with the potential to increase the capability of interconnection to South Australia and provide support to the Victorian, NSW and South Australian regional transmission networks. This sequence of projects involves the reinforcement of both the transmission networks and the duplication of Murraylink. As the matter of South Australian interconnection capacity is currently under consideration by AEMO and the TNSPs, the transmission elements constituting this upgrade have been included in this Proposal as a contingent project.

Murraylink is now entering its second decade of operation. The major elements of equipment that comprise the link (the main transformers, conversion equipment and filters) have a standard life of 40 years. The standard life assigned to the underground cable is 50 years. All of these assets function as a single entity and this misalignment of equipment lives is corrected in this Proposal. Both major asset components are depreciated over their remaining life of approximately 30 years.

Most items of the ancillary equipment necessary for the operation of the link (notably equipment such as air conditioners, ventilation fans, water pumps and treatment apparatus, control and protection systems) have much shorter useful lives than these major assets. Much of this equipment will require refurbishment or replacement during the 2013-23 regulatory control period. These refurbishment projects have been factored into the capital expenditure program.

Even with a best-practice maintenance program, there will be an increasing risk of failure of a component of the link as the equipment ages. Murraylink carries insurance to cover the cost of premature failure of a major item of equipment. To the extent that any such major failure was not covered by insurance, Murraylink would seek the approval of the AER to pass through the associated cost.

Murraylink's historic service performance has been excellent, as discussed in section 4.4 and shown in Table 1.

Table 1 – Historic service performance

F/Y ending	2004	2005	2006	2007	2008	2009	2010	2011
Target planned availability	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%
Actual planned availability	98.75%	98.18%	99.11%	99.32%	99.22%	99.31%	99.58%	99.11%
Difference	0.42%	0.99%	0.06%	-0.15%	0.05%	0.14%	0.41%	-0.06%
Target forced peak availability	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.17%
Actual planned availability	98.89%	99.63%	99.76%	96.42%	99.99%	100.00%	100.00%	99.8%
Difference	0.59%	-0.15%	-0.28%	3.06%	0.51%	0.52%	0.52%	-0.59%
Target forced o/p availability	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.3%
Actual forced o/p availability	99.38%	99.72%	99.91%	94.69%	99.95%	100.00%	100.00%	99.9%
Difference	-0.04%	-0.38%	-0.57%	4.65%	0.61%	0.66%	0.66%	-0.57%
S-factor bonus/penalty	**-0.79%**	**0.15%**	**0.18%**	**-0.32%**	**0.69%**	**0.87%**	**1.00%**	**0.70%**

Murraylink's historic capital expenditure is detailed in section 4.2 and shown in Table 2. The ACCC did not provide an allowance for capital expenditure in the 2003 determination. During the first few years, in which some repairs were covered by the warranty, Murraylink's capital expenditure was indeed zero. However, since that time, some expenditure of a capital nature has been required and is forecast, mainly on ancillary equipment needing refurbishment to maintain the secure operation of the link.

Table 2 – Historic capital expenditure

F/Y ending	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Regulatory Allowance	0	0	0	0	0	0	0	0	0	0
Actual Expenditure[1]	0	0	0	0	410	0	21	37	640	1,118
Difference	0	0	0	0	410	0	21	37	640	1,118

[1] The 2012 and 2013 years are estimated.

The historic Murraylink operating expenditure is set out in Table 3. A major component of the operating costs has been competitively outsourced and the actual expenditure is slightly less than the allowance provided in the ACCC's 2003 determination. More detail on the historic operating expenditure is set out in section 4.3

Table 3 – Historic operating expenditure

F/Y ending	2009	2010	2011	2012	2013
Regulatory Allowance[1]	3,380	3,450	3,520	3,590	3,660
Actual Expenditure[2]	3,200	3,256	3,426	3,426	3,559
Difference	-180	-194	-94	-164	-101

[1] Adjusted for CPI.

[2] The 2012 and 2013 years are estimated.

The basis for the proposed capital expenditure forecast for Murraylink for the 2013-23 regulatory control period is set out section 7 and summarised in Table 4. The majority of this expenditure is associated with the refurbishment of ancillary equipment necessary for the secure operation of the link.

Table 4 – Forecast capital expenditure

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2013-23
Total	3.757	3.044	2.882	0.360	1.363	0.375	0.075	0.093	0.516	1.120	13.587

Murraylink's proposed operating expenditure is set out section 8 and summarised in Table 5. This forecast is a projection of the existing competitively sourced maintenance costs, with an appropriate allowance for real cost escalation.

Table 5 – Forecast operating expenditure

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2013-23
Total	3.582	3.589	3.670	3.724	3.823	3.947	4.025	4.133	4.188	4.312	38.995

The proposed Murraylink revenue and price path builds upon these forecast costs and has been calculated in accordance with the Rules and the AER's guidelines. the proposed revenue requirement, smoothed revenue trajectory and X-factors are set out in Table 6.

Table 6 – Revenue requirement and price path

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Unsmoothed revenue requirement	13.76	14.45	15.15	15.83	16.09	16.45	16.70	16.95	17.15	17.17
Smoothed revenue requirement	14.77	15.01	15.25	15.49	15.74	15.99	16.24	16.50	16.76	17.03
X factor	-1.67%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

The principal challenge associated with Murraylink relates to maintaining an inherently complex electrical installation, with its many sub-components, to meet high standards of availability for service. These component assets are now approaching their mid-life. Whilst they have so far proven reliable, they must be maintained to rigorous standards and their condition closely monitored, to avert unplanned premature failure.

In addition, the remote rural setting and environment of the link imposes logistics issues and costs for Murraylink's maintenance operations.

This Revenue Proposal demonstrates how Murraylink will address these challenges. It also provides comprehensive evidence of the revenue needs for the 2013-23 regulatory control period.

1 Introduction

1.1 About Murraylink Transmission Company

Murraylink is a privately funded electricity transmission asset operated by the Murraylink Transmission Company Pty Ltd.. It includes the world's longest underground power cable (180 kilometres) and connects the Victorian and South Australian regions of the National Electricity Market (NEM), transferring power between the Red Cliffs substation in Victoria and the Monash substation in Berri, South Australia. Murraylink's current rated capacity is 220 Megawatts (MW).

Murraylink originally operated in the NEM as a market network service provider (MNSP) under clause 2.5.2(d) of the then *National Electricity Code*, relying on the spot price differential between the Victorian and South Australian regions of the NEM, or contractual arrangements, to earn revenue. By decision dated 01 October 2003, the ACCC decided under section 2.5.2(c) of the *Code* to reclassify Murraylink's services from market network services to prescribed network services, thus converting the Murraylink Transmission Company from a Market Network Service Provider to a Prescribed Network Service Provider.

The ACCC determined Murraylink's maximum allowable revenues for the nominal 10-year period until 30 June 2013. This revenue Proposal is for a second 10-year regulatory control period, from 1 July 2013 to 30 June 2023.

1.1.1 Corporate Structure

Murraylink Transmission Company Pty Ltd is 100% owned by Energy Infrastructure Investments Pty Ltd, which in turn is owned by a consortium of investors, as shown below.

Table 1.1 – Murraylink ownership structure

Shareholder	Ownership percentage
Dalmeny Gas & Power Holdings BV	24.95
Midstream Investment First BV	24.95
Osaka Gas Energy Europe BV	30.20
Australian Pipeline Limited	19.90
Total	**100.0**

1.2 Purpose of the document

This Revenue Proposal provides details of Murraylink's revenue requirements for prescribed transmission services for its second regulatory control period. This period is proposed to span 10 years, from 1 July 2013 to 30 June 2023.

This Revenue Proposal has been developed in accordance with Chapter 6A of the *National Electricity Rules* (Rules) and the AER's Electricity Transmission Network Service Providers Submission Guidelines[1,2].

During the 2013-23 regulatory period, Murraylink will require the investment program outlined in this Proposal, to continue to reliably perform its role as an interconnection between the Victorian and South Australian Regions of the National Electricity Market (NEM).

This Revenue Proposal is submitted by Murraylink Transmission Company Pty Ltd (ACN 089 875 080) Level 19, 580 George Street, Sydney NSW 2000.

1.3 Length of regulatory control period

Section 4.3.13 of the Submission Guidelines requires Murraylink to propose the commencement and length of the regulatory control period.

Murraylink's current (first) regulatory control period was for the nominal 10-year period from 1 October 2013 to 30 June 2013.

Murraylink therefore proposes that the length of the new regulatory control period also be 10 years, from 1 July 2013 to 30 June 2023.

1.4 Services provided by Murraylink

Murraylink is notionally located within the South Australian region of the NEM. The link is connected to the transmission systems of:

- ElectraNet, in South Australia, at Monash 132 kV substation; and
- SP AusNet, in Victoria, at Red Cliffs 220 kV terminal station. The location of this connection is also in close proximity to the Victorian – NSW interconnection between Red Cliffs and Buronga.

As an element of the transmission network, Murraylink provides prescribed transmission services to customers throughout the NEM. There are no negotiated services associated with these two connections to Murraylink.

1.5 Map of the transmission network

As required by Section 4.3.23 of the Submission Guidelines, Figure 1.1 is a schematic transmission network map. This map identifies the Murraylink

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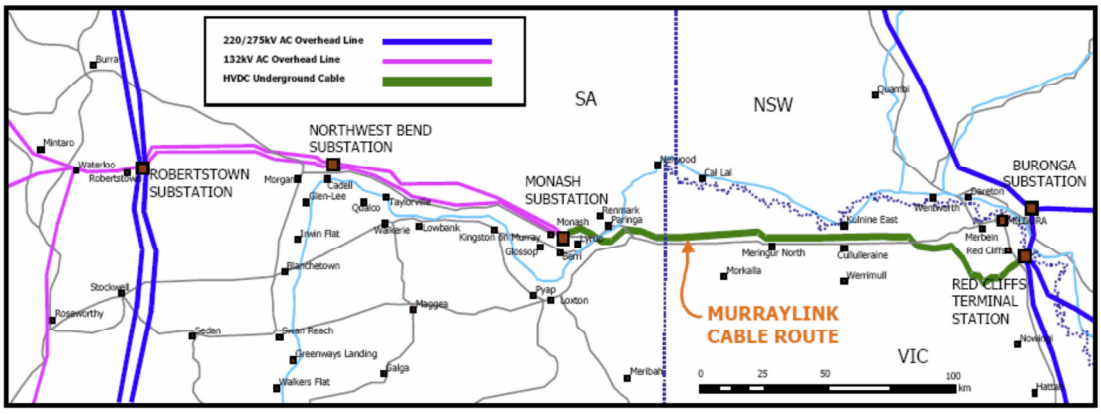
1 Australian Energy Market Commission, *National Electricity Rules* Version 49.

2 Australian Energy Regulator, *Final Electricity transmission network service providers Submission guidelines*, September 2007.

transmission line and the location of major network assets in the adjacent ElectraNet and SP AusNet transmission networks.

Figure 1.1 – Murraylink transmission connection



1.6 *Structure of this document*

The following Sections of this Revenue Proposal are structured as follows:

- Chapter 2 describes the environment in which Murraylink operates and the main challenges anticipated in the next regulatory control period.
- Chapter 3 describes how compliance with the requirements of the Rules and the AER's Guidelines has been met.
- Chapter 4 describes the historic cost and service performance.
- Chapter 5 outlines the calculation of the regulated asset base for the forthcoming regulatory period, using the AER's Roll Forward Model (RFM).
- Chapter 6 explains Murraylink's capital financing costs and taxation.
- Chapter 7 describes the capital expenditure forecast.
- Chapter 8 describes the operating expenditure forecast.
- Chapter 9 describes the depreciation allowance.
- Chapter 10 presents the revenue needs for the 2013-23 regulatory control period, calculated using the AER's Post-Tax Revenue Model.
- Chapter 11 presents the proposed Service Target Performance Incentive Scheme (STPIS).
- Chapter 12 discusses the requirements for a Pricing Methodology and a Negotiating Framework for Murraylink.

To assist the AER in assessing the compliance of this Revenue Proposal with the Rules and Submission Guidelines, Murraylink has provided a compliance checklist as Attachment 1.1 to this Proposal. This checklist cross-references the relevant

Sections of this Revenue Proposal and the attachments that address each of the Submission Guidelines requirements.

1.7 *Directors' Responsibility Statement*

In accordance with the Rules and Section 4.3.2 of the Submission Guidelines, this Proposal must contain a certification of the reasonableness of the key assumptions that underlie the capital expenditure forecast by the Directors of Murraylink[3].

The Director's Responsibility Statement is included in Attachment 1.2.

[3] AEMC, National Electricity Rules, Chapter 6A, schedule S6A.1.1(5).

2 Business environment and key challenges

2.1 Introduction

This Revenue Proposal demonstrates how Murraylink expects to continue providing a flexible and cost effective transmission service in the NEM, whilst maintaining high levels of service availability.

Murraylink's capital and operating costs are driven by the business and natural environment in which it operates. Key elements of this environment include:

- Obligations to meet the broad range of legislative and administrative requirements that apply to the jurisdictions in which Murraylink operates;
- An obligation to meet increasing standards of public safety now being adopted by other network businesses;
- The harsh climactic conditions in which its sophisticated terminal equipment must operate;
- The need to replace or refurbish items of ageing ancillary equipment nearing the end of their useful life, to maintain availability standards for the DC link;
- The remoteness of Murraylink from major centres of population and industry;
- Rising borrowing costs, due to the global financial crisis; and
- Unprecedented competition for skilled labour and materials, from both the resources and utility sectors.

This Chapter elaborates on Murraylink's environment and the ensuing challenges that must be taken into account when establishing the required revenue for the 2013-23 regulatory control period.

2.2 Murraylink's role and obligations

Murraylink is registered as a TNSP in the NEM under clause 2.5.1 of the Rules and must comply with those Rules. These obligations under the Rules require Murraylink to operate as an efficient regulated network service provider and comply with the transmission network and technical performance standards (e.g. planning, design and operating criteria).

Murraylink and its maintenance service providers are also subject to numerous other environmental, cultural heritage, planning approval, Workplace Health & Safety, financial and other regulatory obligations or requirements under a range of Federal, State and local government legislation, Codes, Standards, policies and other instruments in the jurisdictions in which it operates – South Australia and Victoria.

The main legislative and statutory obligations that Murraylink must meet are referenced throughout the Proposal and in the supporting documentation.

2.3 Meeting customer demand

Murraylink is an integral part of the transmission system that forms the NEM. The demand that is placed on its network services arises from the requirement for energy to be transported between the Victorian/NSW and South Australian regions, to minimise the overall costs of production in the NEM. Murraylink also supports the regional transmission systems in the north-west of Victoria and South Australia's Riverland area. The link is dispatched by AEMO to meet these objectives and transports energy in either direction, as the situation requires.

The demand for interconnection capacity between Victoria and South Australia is increasing, due largely to the development of renewable energy resources in this jurisdiction. This is the subject of current investigations by AEMO and the TNSPs.

Murraylink's transmission network services must therefore remain available at their maximum available capacity and with a high level of availability, throughout the 2013-23 regulatory control period.

The maximum useable capacity from the Murraylink interconnection is limited from time to time by the capability of the conventional transmission networks to which the link is connected, particularly when elements of those networks are constrained or out of service.

Murraylink believes the link could provide greater value to the market, if its capability for rapid changes in power transfer and voltage support were better integrated into the planning of the interconnected national grid. To this end, Murraylink is participating in joint planning discussions with AEMO and the adjacent TNSPs.

The capacity of the link could be more fully utilised than at present at modest cost, using more sophisticated systems to control the power flow and voltage compensation provided by Murraylink. The basic configuration and capacity of the link would not be affected.

As these augmentations may take place during the next regulatory control period, Murraylink has included two projects to upgrade the utilisation of the link in its capital expenditure Proposal. These projects are described in Section 7.7.

Murraylink has also developed a sequence of augmentations to increase the interconnection capacity to South, Australia making use of the existing transmission corridor through Murraylink. These developments have been included as a contingent project in this Proposal, but are subject to further detailed analysis, the application of the RIT-T and the approval of the AER.

2.4 A maturing asset base

There are two classes of equipment that comprise the link:

- Major elements of equipment (main transformers, conversion equipment, filters and underground DC cable). These have a standard life of 40 years or more, and are approaching the mid-period of their useful service lives; and

- Ancillary equipment necessary for the operation of the link (notably air conditioners, water storage and treatment apparatus, control and protection systems). These elements have service lives of 7 - 20 years and in many cases, are approaching this stage.

Murraylink is now entering its second decade of operation. There are a number of elements of ancillary equipment that will require refurbishment or replacement during the 2013-23 regulatory control period. These elements have been factored into the capital expenditure program in Section 7.

Even with a best-practice maintenance program, with age, there is an increasing risk of failure of an element of the link as equipment ages. Murraylink carries insurance to cover the cost of premature failure of a major item of equipment. However, to the extent that such a major failure was not covered by insurance, Murraylink would seek the approval of the AER to pass through the associated cost. An application for additional funding of this nature was approved by the AER in 2007, following equipment failure and fire at the Berri terminal station.

2.5 External factors affecting input costs

2.5.1 Murraylink logistics

The terminal stations and underground cable that comprise Murraylink are in a remote rural location, some 300 km from Adelaide and 700 km from Melbourne. As a consequence, this imposes logistics issues for:

- Obtaining skilled maintenance staff;
- The travelling and local accommodation of staff;
- The delivery of spares and equipment; and
- Local storage of spares and equipment.

Notwithstanding that a significant portion of Murraylink maintenance is carried out by a principal maintenance contractor, these cost imposts are factored into the contract costs, as well as the costs incurred directly by Murraylink.

2.5.2 Cost escalation

A number of factors will cause real escalation in Murraylink's capital and operating costs during the new regulatory control period. Murraylink engaged BIS Shrapnel to provide expert advice on this matter and develop an appropriate range of real cost escalation factors specific to the jurisdictions in which it operates. This BIS Shrapnel report is included as Attachment 8.1.

The main aspects of the economic outlook that are expected to affect costs are increases in labour and contractor costs. The escalation of both cost categories is expected to be modest for the first six years as a number of major energy infrastructure projects are completed, particularly in South Australia.

2.5.3 Connection costs

Murraylink pays connection charges to the adjacent TNSPs SP AusNet and ElectraNet. These connection costs are a significant component of the operating cost. The connection costs may change, potentially significantly, during the Murraylink regulatory control period, as a result of AER regulatory decisions in 2013 and 2018 for ElectraNet and 2014 and 2019 for SP AusNet.

As a consequence, Murraylink is proposing an annual adjustment to revenue for the difference between the estimated connection costs in this proposal and the annual payments made to the TNSPs.

3 Operating and capital expenditure compliance

3.1 Introduction

This Proposal has been prepared to comply with the requirements of the Rules and the Submission Guidelines.

This Chapter describes Murraylink's governance and compliance arrangements. Specific compliance requirements are also set out in the following Chapters of the Proposal.

3.2 Corporate governance

An excerpt from the EII Asset Management Plan forms Attachment 7.1 to this Proposal and this underpins the associated capital and operating cost forecasts.

Also contained in the AMP is a description of the processes that are used to establish the risks associated with each asset and, from that, determine the required activity. Adherence to specific plans is required and these include:

- Environmental Management Plan;
- Emergency Response Plan; and
- Safety and Operating Plan

Murraylink capital and operating expenditures are subject to an annual budgeting process and to close scrutiny by the shareholding entities.

Murraylink believes that it has demonstrated reasonable adherence to the capital and operating expenditure allowances provided by the ACCC in the 2003 determination:

- In relation to capital expenditure, no capital expenditure allowance was provided. This appears to have been an oversight, in that it failed to make allowance for the requirement to refurbish items of ancillary equipment that have much shorter service lives than the major equipment. For the first 5 years, capital expenditure was contained at zero. However, in the last few years, these refurbishment requirements have escalated; and
- Operating expenditure is competitively outsourced. It is notable that Murraylink has been successful in containing the cost of maintenance services to below the CPI- adjusted regulatory allowance.

3.3 Cost allocation

The Cost Allocation Methodology for Murraylink and Directlink was originally approved by the AER in July 2008. In December 2008, the Murraylink and Directlink assets were transferred from the APA Group to Energy Infrastructure Investments (EII). EII subsequently applied to the AER for the approval of minor amendments to

the Methodology. In March 2010, the AER approved this revised Cost Allocation Methodology.[4]

In preparing the operating and capital expenditure records and forecasts accompanying this Proposal, Murraylink has used the approved Cost Allocation Methodology on both a historical and prospective basis. This document is submitted as Attachment 3.1 to the Proposal.

The Cost Allocation Methodology and related procedures are regularly reviewed to ensure compliance to statutory, taxation and regulatory requirements while meeting Murraylink's business reporting needs.

3.4 Interaction between operating and capital expenditure

The Rules[5] and Section 4.3.5 of the Submission Guidelines require that a Revenue Proposal identify and explain any significant interactions between capital and operating expenditure.

Murraylink is unlike a conventional transmission business in that it comprises a single transmission line, albeit one employing advanced technology. There are no major works planned; rather a limited number of capital expenditure projects mainly associated with:

- maintaining statutory and OHS compliance; and
- the refurbishment of secondary systems such as water supplies and ventilation systems.

Moreover, maintenance activities are currently carried out by a principal contractor, in accordance with a long-term agreement.

No proposed capital project has been identified, which would involve a significant interaction between capital and operating expenditure.

3.5 Capitalisation policies

Section 4.3.4(c)(2) of the Submission Guidelines requires any changes to the capitalisation policies to be described. Murraylink's capitalisation policies have not changed during the current regulatory control period. Nor, at this time, is Murraylink proposing to change its capitalisation policies during the next regulatory period.

3.6 Related parties

As required by Section 4.3.24 of the Submission Guidelines, Murraylink confirms that there are no material related party transactions whose costs are attributed to prescribed transmission services. All related party transactions are made on normal commercial terms and conditions and on an arms-length basis. All transactions are

[4] Australian Energy Regulator, Final decision - Electricity Transmission Network Service Providers - Directlink & Murraylink amended Cost Allocation Methodologies, March 2010.

[5] Chapter 6A, schedule S6A.1.3(1).

also consistent with Murraylink's Cost Allocation Methodology and are disclosed in the annual regulatory financial statements in accordance with the AER's Information Guidelines.[6]

[6] AER, Electricity Transmission Network Service Providers Information Guidelines, September 2007.

4 Historic cost and service performance

4.1 Introduction

This Chapter presents a review of Murraylink's historical capital and operating costs and service performance, during the current regulatory control period.

Audited results are available and have been quoted for the three years from 2008/09 to 2010/11. A part-year estimate has been used for 2011/12 and a full year estimate for 2012/13. These costs are contained within the AER's cost information template, which forms Attachment 4.1 to this Proposal.

This analysis includes the comparison of Murraylink's capital and operating expenditure outcomes against the AER allowance. This is followed by a review of performance under the AER's Service Target Performance Incentive Scheme (STPIS).

4.2 Historic capital expenditure

In its October 2003 Determination, the ACCC did not make allowance for any capital expenditure by Murraylink[7]. Whilst there have not been any planned replacements of major items of plant, there have been a number of minor projects required during the current regulatory control period, to maintain the serviceability and performance of the link. The ancillary assets essential for the operation of the link (pumps, fans and other rotating machinery) have useful lives much shorter than the primary equipment.

The historic capital expenditure is outlined in Table 4.1.

Table 4.1 – Historic capital expenditure (nominal, $'000)

F/Y ending	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Regulatory Allowance	0	0	0	0	0	0	0	0	0	0
Actual Expenditure[1]	0	0	0	0	410	0	21	37	640	1,118
Difference	0	0	0	0	410	0	21	37	640	1,118

[1] The 2012 and 2013 years are estimated.

Murraylink has included these capital expenditure items in the roll-forward of the RAB, as outlined in Chapter 5. The more significant expenditure in the final year arises from the planned refurbishment of several items of auxiliary equipment at the Murraylink substations. These rotating machines by then will be 10 years old and by then require major overhaul.

7 Murraylink Transmission Company - *Application for Conversion and Maximum Allowed Revenue* – 1 October 2003, Australian Competition and Consumer Commission, p. 164.

4.3 Historic operating expenditure

The regulatory allowance for operating expenditure during the current regulatory control period is compared with the actual and forecast expenditures in Table 4.2. The regulatory allowance provided in the Determination has been adjusted for out-turn and current forecast inflation.

The actual operating expenditures in Table 4.2 have been subdivided into the same categories as the forecast operating expenditures in Chapter 8, reflecting the principal cost drivers.

Table 4.2 – Historic operating expenditure (nominal, $'000)

F/Y ending	2009	2010	2011	2012	2013
Regulatory Allowance[1]	3,380	3,450	3,520	3,590	3,660
Actual Expenditure[2]	3,200	3,256	3,426	3,426	3,559
Maintenance	789	729	816	816	891
Operations and asset management support	2,143	2,144	2,089	2,089	2,135
Non system	269	384	522	522	533
Difference	-180	-194	-94	-164	-101

[1] Adjusted for CPI.

[2] The 2012 and 2013 years are estimated.

The change to the Non system cost in 2010/11 arose from the sale of the Murraylink business by the APA Group to EII. During December 2008, a Commercial Service Agreement was entered into between the APA Group and EII. As part of this Agreement, APA provides accounting and other business services for a fee.

4.4 Historic Service Target Performance Incentive Scheme

In 2007, the AER imposed its Service Target Performance Incentive Scheme (STPIS) on Murraylink[8]. Although the scheme was subsequently been modified on two occasions, the Transmission Circuit Availability parameter has applied consistently to Murraylink since 2008.

The historic availability performance against the STPIS target is set out in Table 4.3, along with the financial impact of the scheme.

[8] Australian Energy Regulator, First Proposed Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme - Version No: 01, January 2007.

Table 4.3 – Historic Service Target Performance Incentive (nominal, $'000)

Year	2004	2005	2006	2007	2008	2009	2010	2011
Target planned availability	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%
Actual planned availability	98.75%	98.18%	99.11%	99.32%	99.22%	99.31%	99.58%	99.11%
Difference	0.42%	0.99%	0.06%	-0.15%	0.05%	0.14%	0.41%	-0.06%
Target forced peak availability	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.17%
Actual planned availability	98.89%	99.63%	99.76%	96.42%	99.99%	100.00%	100.00%	99.8%
Difference	0.59%	-0.15%	-0.28%	3.06%	0.51%	0.52%	0.52%	-0.59%
Target forced o/p availability	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.3%
Actual forced o/p availability	99.38%	99.72%	99.91%	94.69%	99.95%	100.00%	100.00%	99.9%
Difference	-0.04%	-0.38%	-0.57%	4.65%	0.61%	0.66%	0.66%	-0.57%
S-factor bonus/penalty	**-0.79%**	**0.15%**	**0.18%**	**-0.32%**	**0.69%**	**0.87%**	**1.00%**	**0.007**

5 Regulatory asset base

5.1 Introduction

This Chapter explains how Murraylink has determined the proposed opening Regulatory Asset Base (RAB) for the new regulatory control period.

Murraylink is required by the Rules and by Sections 4.3.9 and 4.3.19 of the Submission Guidelines to provide a completed asset Roll Forward Model (RFM) to accompany its Proposal. The RFM forms Attachment 5.1 to this Proposal.

5.2 Roll forward methodology

The opening RAB as at 1 October 2003 was established by the ACCC in its Murraylink 2003-13 revenue cap Decision, at $97.33 million[9].

From that starting point, Murraylink has calculated the value of its opening RAB as at 1 July 2013. The annual adjustments to the RAB included:

- Increase by the amount of capital expenditure incurred during the current regulatory control period, to 2010/11;
- Increase by the estimated amount of capital expenditure for 2011/12 and 2012/13;
- Reduction by the amount of depreciation of the RAB, using the rates and methodologies allowed for in the ACCC's 2003 Murraylink Decision;
- Reduction by the value of assets disposed during the current regulatory period; and
- Indexation by CPI.

These adjustments have been calculated using the AER's RFM.

[9] AER, Decision - Murraylink Transmission Company *Application for Conversion and Maximum Allowed Revenue*, 1 October 2003, p. 167.

5.3 Regulatory Asset Base as at 1 July 2013

The outcome of applying the AER's roll forward methodology and RFM is an opening RAB for Murraylink of $102.4 M, for the 2013-23 regulatory control period. This calculation is set out in Table 5.1.

Table 5.1 – Opening RAB as at 1 July 2013 ($million, nominal)

FY ending	2003 (9mths)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Opening Asset Base	102.96	102.96	99.74	99.31	99.20	99.29	99.56	101.11	100.85	100.98	102.57
Capex	0.00	0.00	0.00	0.00	-0.36	0.43	0.00	0.04	0.08	1.18	1.36
Depreciation	0.00	-3.22	-0.43	-0.11	0.45	-0.15	1.54	-0.30	0.05	0.41	-1.54
Closing Asset Base	102.96	99.74	99.31	99.20	99.29	99.56	101.11	100.85	100.98	102.57	**102.40**

6 Cost of capital and taxation

6.1 Introduction

The regulated rate of return for a TNSP is required by the Rules to be equivalent to the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk.[10] This regulatory rate of return should be sufficient to ensure the continuing viability of the business, and provide for a reasonable opportunity to recover, at least, the efficient costs of providing prescribed transmission services and complying with regulatory obligations.[11]

On 1 May 2009, the AER released its Final Decision and Statement on its Review of the Weighted Average Cost of Capital (WACC) Parameters for Electricity Network Service Providers.[12] The Statement of Revised WACC Parameters (Transmission) specifies the following:

- Risk free rate is to be based on the annualised yield on 10-year Commonwealth Government bonds, for an agreed or specified period;
- Equity beta: 0.8;
- Market risk premium: 6.5%;
- Gearing: 60%;
- Credit rating: BBB+; and
- Gamma (utilisation of imputation credits): 0.65.

Murraylink has adopted these values for the purposes of its Proposal. However, a number of other parameters must be estimated to derive the rate of return.

6.2 Proposed Weighted Average Cost of Capital

The elements of the WACC calculation and demonstration of compliance with the Rules are required by Sections 4.3.10 and 4.3.15 of the Submission Guidelines. This is set out in the following Sections. Murraylink has also completed and lodged Submission Guideline pro forma statement 7.1.

6.3 Nominal risk free rate

As required by clause 6A.6.2(c)(2) of the Rules, Murraylink has nominated a period to be used by the AER to calculate the nominal risk free rate for the 2013-23 regulatory period. This information was provided to the AER on a confidential basis, and will not be disclosed prior to the release of Murraylink's Final Determination. Murraylink reserves the right to propose an alternative period within a reasonable

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10 AEMC, *National Electricity Rules*, clause 6A.6.2.

11 *National Electricity Law* s7A(2).

12 AER, *Statement of the Revised WACC Parameters (Transmission)*, May 2009 and *Final Decision, Review of the Weighted Average Cost of Capital (WACC) Parameters*, May 2009.

timeframe, in the event that market conditions within the proposed averaging period appear abnormal.

For the purpose of calculating an indicative WACC estimate, the risk free rate has been taken to be the same as that in the Powerlink final Determination, at 4.17 per cent[13].

6.4 *Debt risk premium*

The cost of debt is the sum of the risk free rate and the debt risk premium (DRP). The purpose of the DRP is to compensate the additional cost of debt financing a benchmark regulated network asset, above the yield on Australian government debt which is deemed to be risk free.

The estimation of the DRP has been a source of considerable dispute in recent gas and electricity regulatory proceedings. With the cessation of the publication of CBASpectrum's fair value estimates in 2010, Bloomberg is the only remaining recognised provider of fair value estimates. However, rather than relying upon Bloomberg's (extrapolated) estimates, the AER in the recent Powerlink and Aurora draft decisions[14] has elected to calculate the DRP based on an arithmetic average yield of a sample of bonds that met all of the following conditions:[15]

- Australian domestic corporate issuances;
- received a rating of either BBB, BBB+ or A- by Standard and Poor's;
- have between seven and 13 years remaining term to maturity; and
- for which yield data are available from Bloomberg or UBS.

Recently, the Victorian gas networks have jointly commissioned the Consulting Economics Group[16] (CEG) and PwC[17] to advise them on the appropriate DRP. The CEG report (included as Attachment 6.1 to this submission) and PwC report (included as Attachment 6.2 to this submission) examine the implications of the recent approach adopted by the AER to estimating the DRP.

Specifically, PwC and CEG find that the AER's "bond sample" approach contains a number of serious flaws. Specifically, by setting aside the Bloomberg fair value

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13 AER, Powerlink Transmission determination 2012–13 to 2016–17, April 2012, p. 6.

14 Murraylink acknowledges that the AER, in its recent final decisions for PowerLink and Aurora, and the draft decision for the Roma Brisbane Pipeline, have applied the extrapolated Bloomberg approach pending a more fulsome consultation process on calculating the debt risk premium.

15 SG.2 - Australian Energy Regulator, *Draft decision, Powerlink transmission determination, 2012-13 – 2016-17,* November 2011, page 215; and
SG.3 - Australian Energy Regulator, Dr*aft distribution Determination Aurora Energy Pty Ltd 2012-13 to 2016-17*, November 2011, pages 216 to 217.

16 CEG, *Estimating the regulatory debt risk premium for Victorian gas businesses*, March 2012, pages 45 to 59.

17 PwC, *Estimating the benchmark debt risk premium – A report for SP AusNet, Multinet Gas and Envestra*, March 2012, pages 6 to 9.

curve the AER has ignored a respected source of market data that the Australian Competition Tribunal (the Tribunal) has consistently held to be an appropriate benchmark for estimating the DRP. The Tribunal's thinking on the use of Bloomberg curves was set out in the recent Envestra decision:[18]

> *The Tribunal, of course, accepts that in the first instance it is for the AER to determine whether to rely upon the Bloomberg curve, or to accept the extrapolation of that curve in the manner done in the past. It is not obliged to do so, although given the past regulatory decisions it may be expected to do so unless there were sound reasons to depart from that practice. For the future, that is a matter for the AER.*

The Tribunal also stated that yields by Bloomberg (and other service providers) should continue to be relied on:[19]

> *… so long as the published curves are widely used and market respected.*

Murraylink submits that the evidence presented by the AER does not provide sound reasons for departing from its past practice and fails to show that Bloomberg fair value curves are not widely used and market respected. To point, CEG notes that:

> *… the Bloomberg fair value curve is built for and commercially provided to debt market participants who pay to use it for commercial purposes. In deriving its fair value curves Bloomberg has a great deal of information available to it – including, but not limited to, estimates of market prices of many hundreds of bonds across a range of credit ratings and maturities (including but, again, not limited to the BBB to A- bonds charted in this report).*

Furthermore, CEG provide a comprehensive rebuttal of the eight reasons given by the AER for rejecting the Bloomberg fair value curves and concludes that:[20]

> *I do not consider that any of these provide a reasonable basis upon which to conclude that Bloomberg's fair value estimates should not be relied upon once validated against the full range of available data.*

PwC and CEG also identified a number of methodological errors in the AER's approach specifically, the inclusion of bonds issued by:

- ***Coca Cola*** - where the yield on this bond is estimated by Bloomberg, not by direct observations in terms of bids, asks or executed transactions, but by reference to observed comparables, including:
  - the Queensland Treasury Corporation;
  - the New South Wales Treasury Corporation;
  - the Treasury Corporation of Victoria;
  - Eurofima - a AAA rated government owned business; and
  - KFW - a AAA rated business owned by the German government;

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18 SG.9 - Application by Envestra Limited (No 2)[2011] ACompT 4, paragraph 120.

19 SG.4 - Application by Jemena Gas Networks (NSW) Ltd (No. 5) [2011] ACompT 10, paragraph 62; and SG.10 - Application by ActewAGL Distribution [2010] ACompT 4, paragraph 78.

20 CEG, *Estimating the regulatory debt risk premium for Victorian gas businesses*, March 2012, page 49.

- ***SPAusNet*** whose yields were lower due to implicit parental support of the issuer's owners (ie. the Government of Singapore).

The removal of these bond yields from the sample relied on by the AER would increase the DRP calculated for Powerlink and Aurora in their draft decisions to 3.50 per cent. This highlights that the AER's "bond sample" methodology of setting the DRP by reference to a few comparable bonds is very sensitive to the selection criteria adopted by the AER. Murraylink submits that such a methodology would deliver a DRP that is highly variable to whether one or two bonds are included in the sample.

A further criticism is that the AER's "bond sample" approach of using an arithmetic average bond yield is unnecessarily simplistic. The use of more sophisticated econometric techniques would allow the AER to have regard to a wider sample of bond yields. For example, PwC's analysis of direct market data has regard to the yield on 68 different bonds.

Furthermore, the AER's "bond sample" approach implicitly assumes that the key relationships of term to maturity and credit rating are linear. For example, a simple average of a 9 and 11 year bond would only produces an unbiased estimate of a 10 year bond if there was a linear relationship between bond yields and terms. Similarly, a simple average of an A- and BBB rated bond would only provide an unbiased estimate of BBB+ bond yield if there was a linear relationship between bond yields and ratings. The AER provides absolutely no evidence of a linear relationship for either bond terms or yields, when in fact PwC finds that there is evidence that a nonlinear regression best fits the data during the 20 day period ending the 16 December 2011.

6.4.1 PwC estimate of the DRP

PwC estimated the 10 year BBB+ debt risk premium for a 20 day average period up to 16 December 2011, and recommends that the benchmark DRP be estimated by reference to the Bloomberg fair value curve extrapolated to 10 years.

The longest maturity BBB fair value curve published by Bloomberg is 7-years. PwC estimates that the spread of BBB debt to CGS yields increases by 7.6bp per year as the Bloomberg fair value curve is extended from 7 to 10 years. This estimate is based on an examination of the increase in spreads on matched pairs of bonds (from the same issuer) that have maturities comparable to 7 and 10 years.[21]

The matched pair bonds examined by PwC are set out in Table 6.1.

[21] Noting slight variance for rounding.

Table 6.1 – Average annual increment in the debt risk premium for paired bonds – 20 business days to 16 December 2011

	Short Maturity (years)	Long maturity (years)	DRP Bloomberg (bps)	DRP UBS (bps)	DRP increment (bps per annum.)
Telstra	4.7	8.6	9.0	9.5	9.3
Stockland	4.6	9.0	7.1	4.8	5.9
Sydney Airport	4.0	10.0	n/a	7.7	7.7
Average increment			**7.1**	**7.3**	**7.6**

Source: Table 3 of PwC, *Estimating the benchmark debt risk premium – A report for SP AusNet, Multinet Gas, Envestra and APA Group*, March 2012, page 22.

PwC has cross checked this Bloomberg extrapolation through a direct examination of market data estimates of the DRP using economic regressions with different functional forms. PwC tested a range of linear and non-linear functional forms and found that:[22]

> *…out of 411 regressions, the linear functional form had the lowest SIC in 340 (82.7 per cent) cases, followed by the power functional form (superior 71 times). The remaining functional forms did not have the lowest SIC for any 20 day averaging period.*

Regressions using a linear and power functional form resulted in a DRP for a 10 year BBB+ bond of 398 and 385 basis points, respectively. PwC finds that its direct examination of market data estimates of the DRP was consistent with the DRP estimated from extrapolating the Bloomberg fair value curve.

6.4.2 CEG estimate of the DRP

CEG was instructed to test the accuracy of the Bloomberg fair value curve as extrapolated to 10 years by PwC, as set out above. CEG undertook a number of tests to ascertain whether the extrapolated Bloomberg fair value curve provides a robust fit to the data. CEG analysis compared the extrapolated Bloomberg fair value curve to:

- corporate bonds issued by Australian companies in Australian dollars;
- corporate bonds issued by Australian companies in a foreign currency once these are swapped into Australian dollars; and
- alternative fair value curves constructed by CEG.

[22] PwC, *Estimating the benchmark debt risk premium – A report for SP AusNet, Multinet Gas, Envestra and APA Group*, March 2012, page 26.

Examination of Australian bond yields

CEG approached this task by first identifying a population of fixed and floating corporate bonds issued by Australian companies in Australian dollars rated between BBB to A- on issue during the period from 21 November 2011 to 16 December 2011. This population consists of 145 bonds with terms to maturity that range from one month to over 20 years.[23]

CEG first compares the extrapolated BBB Bloomberg fair value curve against those bonds that meet the criteria described above and are rated BBB+ only. CEG finds that the extrapolated Bloomberg BBB fair value curve provides a reasonable estimate for bonds rated BBB+.

CEG notes that the sample size of BBB+ bonds is small and therefore extends its analysis to include a selection of bonds to include fixed and floating corporate bonds issued in Australia in Australian dollars rated BBB to A-, with maturity greater than one year. CEG notes that:[24]

> *Including bonds rated BBB and A- expands the number of bonds materially. However, it does not provide a basis for altering the conclusion that the Bloomberg fair value curve is a good fit to the available data.*

Examination of foreign bond data

CEG then extended its analysis to consider a number of long dated BBB+ and similarly rated foreign currency bonds issued by Australian companies. CEG finds that yields on BBB+ foreign currency bonds issued by Australian companies and swapped back into Australian dollars provides a very good fit to the extrapolated Bloomberg fair value curve.[25]

CEG then extended its sample of foreign bonds to include A- to BBB rated bonds. CEG concluded that the expanded sample shows :[26]

> *BBB+ bond yields (swapped into Australian dollar terms) sitting mostly on or very close to the extrapolated Australian Bloomberg BBB fair value curve (the curve);*
>
> *BBB bonds sitting mostly above, but sometimes below, the curve; and*
>
> *bonds sitting mostly below, but sometimes above, the curve.*

Examination of alternative fair value curves

CEG also compared the extrapolated Bloomberg fair value yields against a number of fair value curves estimated by CEG. CEG fair value yields are estimated using a yield curve functional form based on the method introduced by Nelson and Siegel, to approximate yield curves for US Treasury bills.

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23 CEG, page 10.

24 CEG, page 13.

25 CEG, page 25.

26 CEG, page 26.

CEG estimated a number of Nelson-Siegel yield curves, relying upon the following datasets:

- Australian issued Australian dollar bonds rated BBB+ only;
- Australian issued Australian dollar bonds rated BBB to A-; and
- Australian issued bonds (foreign currency) rated BBB+ only;
- Australian issued bonds (foreign currency) rated BBB to A-;
- Australian issued bonds (both Australian dollar and foreign currency) rated BBB+ only;
- Australian issued bonds (both Australian dollar and foreign currency) rated BBB to A-;

CEG concludes that:[27]

> *… the application of this methodology provides compelling evidence that the preponderance of bond yield data is supportive of a 10 year BBB+ Australian corporate bond DRP consistent with the extrapolated Bloomberg fair value curve figure of 3.92% per annum.*

Murraylink's proposed indicative DRP

Based on this analysis provided by PwC and CEG, APA proposes that a DRP be estimated by extrapolating the BBB Bloomberg fair value yield to 10 years using a paired bond methodology. This approach produces the best estimate of the DRP possible in the circumstances. Over the indicative period of the 20 business days up to and including the 16 December 2011 this approach would result in a DRP of 3.93%.

6.5 Forecast and historic inflation

In previous determinations, the AER has adopted the Reserve Bank of Australia's (RBA) short term forecasts for two years, then applied the mid-point of the RBA's target range of 2.5% for the remaining three years. Murraylink has adopted a similar approach. An inflation forecast for the new regulatory period of 2.5% pa from 2014/15 has been applied.

The RFM requires historic CPI values for the current regulatory control period. Murraylink has applied the actual March quarter CPI, through to the most recently announced escalation of 1.58% for 2012/13.

[27] CEG, *Estimating the regulatory debt risk premium for Victorian gas businesses*, March 2012, page 29.

6.6 Summary of the WACC calculation

A summary of the relevant parameters for calculation of the rate of return is included in Table 6.2. This is contained in AER pro forma 7.1.

Table 6.2 – Proposed WACC parameters

Parameter	Murraylink Revenue Proposal
Nominal Risk-Free Rate	4.17%
Inflation Rate	2.50%
Debt Margin	3.93%
Proportion of Debt Funding	60%
Cost of Debt (Nominal, Pre-Tax)	8.10%
Market Risk Premium	6.50%
Corporate Tax Rate	30%
Gamma	0.65
Equity Beta	0.80
WACC (Nominal, Vanilla)	8.61%

6.7 Taxation allowance

A separate allowance is made in the revenue cap for corporate income tax, net of the value ascribed to dividend imputation credits. The notional taxable income and tax payable, taking into account deductions for tax depreciation calculated from the tax asset base, are derived from the PTRM.

As required by the Rules and Section 4.3.17 of the Submission Guidelines, details relating to the calculation and estimated cost of corporate income tax are provided.[28] The taxation allowance was calculated using the following formula:

$$ETC_t = (ETI_t \times r_t)\ (1 - y)$$

- ETI_t is an estimate of the taxable income a prudent and efficient TNSP would earn in a particular year (t) as a result of providing the same prescribed transmission services as the TNSP under review
- r_t is the expected statutory income tax rate for that regulatory year as determined by the AER, currently 30%
- y is the assumed use of imputation credits, deemed to be 0.65.

[28] *AEMC, National Electricity Rules*, Chapter 6A, clause 6A.6.4.

Murraylink has used the AER's PTRM to calculate the net taxation allowance, summarised in Table 6.3.

Table 6.3 – Tax allowance 2013-23 ($M nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Tax Allowance	0.26	0.28	0.29	0.31	0.32	0.34	0.35	0.36	0.38	0.38

6.7.1 Summary

In accordance with the Rules and Submission Guidelines, this Chapter explained the elements of WACC used for the cost of capital. Murraylink has adopted the values in the AER's Statement of Revised WACC Parameters where required, and has adopted expert advice and methodology in relation to the debt margin. In addition, the approach for calculating the nominal risk free rate, debt margin and forecast inflation is provided. The completed PTRM and Submission Guideline pro forma 7.1 accompany this Revenue Proposal.

7 Forecast capital expenditure

7.1 Introduction

This Chapter contains Murraylink's capital expenditure forecasts for each year of the 2013-23 regulatory control period, as well as the total for the period. The Chapter also describes the capital expenditure categories used and the methodology adopted to forecast the capital expenditure. The major inputs and assumptions underpinning the forecasts are explained.

The major projects that contribute to the capital expenditure forecast are described. The forecast capital expenditure is then demonstrated to be efficient. Finally, a contingent project during the new regulatory control period is outlined.

The resulting forecast capital expenditures are set out in the AER's Cost Information template, which forms Attachment 4.1 to this Proposal.

7.2 Rules and AER Submission Guidelines requirements

The information and matters relating to capital expenditure that must be provided in Murraylink's Proposal are set out in the Rules.[29] The proposed capital expenditure must:

- Meet the capital expenditure objectives;
- Comply with the AER's Submission Guidelines;
- Be allocated to prescribed transmission services in a manner consistent with the Cost Allocation Methodology;
- Include both total and year-by-year forecasts; and
- Be a reliability augmentation, or have satisfied the AER's Regulatory Investment Test (RIT), if required.

The Proposal should also include capital expenditure required in relation to contingent projects.

Section 4.3.3 of the Submission Guidelines also stipulates the minimum capital expenditure information requirements which a TNSP must provide in its Revenue Proposal, including the nature and form of some of these requirements. Murraylink considers that the information in the Sections below meets these requirements. In addition, Murraylink has prepared and submitted the requisite pro forma statements relevant to forecast capital expenditure namely, 4.1, 4.2, 4.3 and 4.4.

No capital expenditure corresponding to reliability augmentations or for projects that have satisfied the RIT has been identified.

[29] AEMC, *National Electricity Rules*, clause 6A.6.7 and schedule S6A.1.1.

7.3 Capital expenditure objectives

The capital expenditure that Murraylink has proposed is required to:

- Maintain the full capacity of the link, for the duration of the regulatory control period;
- Continue to comply with the range of applicable regulatory obligations described in Section 2.2;
- Maintain the security of supply of prescribed transmission services, in accordance with its obligations under the Rules; and
- Maintain the reliability, safety and security of the transmission system through the continued supply of prescribed transmission services.

Murraylink considers that this Revenue Proposal achieves the capital expenditure objectives set out in the Rules.[30]

7.4 Capital expenditure categories

The demand for Murraylink's service will remain equal to its maximum capability during the new regulatory control period. The capital expenditure is therefore not growth related. Expenditure is directed at maintaining the maximum capability of the link with a high degree of reliability, whilst ensuring that all regulatory, statutory and legislative requirements are met.

The major items of plant that comprise Murraylink – the convertor equipment, transformers, filters and cable have been maintained in serviceable condition in accordance with the manufacturer's recommendations. There is therefore no capital expenditure anticipated on this equipment during the new regulatory control period.

The projects that go to make up the proposed capital expenditure program are associated with the following investment drivers:

- Refurbishment: The refurbishment or replacement of auxiliary equipment nearing the end of its useful life, necessary for the functioning of the link;
- Compliance: Meeting legislated and industry accepted safety and environmental standards; and
- Capability: Enhancing the control systems that permit the power flow of the link to be varied in response to AEMO's requirements, thereby improving Murraylink's capability to support the market operation.

To assist the AER's understanding of the capital expenditure program, capital expenditure projects have been subdivided into these three categories, reflecting their principal driver.

30 AEMC, National Electricity Rules, Chapter 6A.6.7.

7.5 Forecasting methodology

Murraylink's forecast of capital projects in the ***Refurbishment*** and ***Compliance*** categories was developed in the context of its asset management practices, which aim to ensure that:

> The EII assets are designed, constructed, operated and maintained in an appropriate manner to ensure that they will continue to meet the required service levels efficiently and cost effectively. [31]

These management practices and a description of the associated projects are included in the EII Asset Management Plan, of which an excerpt is provided in Attachment 7.1. This document has a 5-year planning horizon, and contains some information on planned projects.

This has been supplemented with business cases for the projects that are expected to be required in the latter part of the regulatory control period, in Attachment 7.2.

7.6 Key inputs and assumptions

7.6.1 Asset replacement/refurbishment framework

Murraylink's asset management processes are described in the Asset Management Plan. This process calls for the:

- maintenance history;
- condition; and
- service performance;

of each component of equipment to be monitored.

Plans to replace or refurbish equipment components are formulated when:

- The service performance of the equipment deteriorates, to the point where it jeopardises the availability performance of the link; or
- Maintenance costs escalate, to the point where it becomes economic to replace or refurbish the equipment.

[31] Asset Management Plan - July to December 2009, Energy Infrastructure Investments. p.2.

7.6.2 Project scope, cost and timing estimates

Murraylink's approach to estimating the scope, cost and timing of the projects that comprise the capital expenditure program is set out in Table 7.1.

Table 7.1 – Project scope and cost estimates

Expenditure Category	Refurbishment	Compliance	Capability (Contingent)
Project Scope	All projects are relatively small in scope and readily specified.		Not able to be fully determined at this stage
Project Timing	Based on equipment condition.	As soon as is reasonably practicable.	Pending detailed analysis, not able to be determined at this stage.
Project Cost Estimate	Based on similar minor works carried out for Murraylink, or by obtaining a quotation for the work from existing service providers.		Not able to be accurately estimated at this stage, based on likely control system changes.

7.6.3 Cost escalation

The cost escalators described in Section 8.5 were used in preparing the capital cost forecasts.

7.7 Significant components of the capital expenditure program

The following projects form significant elements of the capital expenditure program. They are detailed in the supporting information that accompanies this Proposal. These projects are:

- ***Security fence replacements at Berri and Red Cliffs*** – The security fences at the Berri and Red Cliffs converter stations have been in place since their establishment over a decade ago and will need to be upgraded to the current standard during the next regulatory period to reduce the risk of unauthorised access by the public.
- ***Transformer earth switches at Berri and Red Cliffs*** – were not installed at the time of commissioning and are required for OH&S reasons, to avoid operator injury whilst installing portable earths on connections seven metres above the ground.
- ***Additional chillers at Berri and Red Cliffs***- the operation of the converter station is dependent on the correct operation of several different computerised control systems. These control systems malfunction when the ambient temperature in the control rooms is not maintained at a stable level below 22°C.

The failure of a single chiller at either convertor location could currently cause the link to shut down in hot conditions and a second chiller will provide the appropriate level of security for the link.

- ***Control system enhancements*** - The flow in Murraylink is capable of being altered from its maximum capability in one direction of 200 MW, through to maximum capability in the opposite direction, in a matter of milliseconds. The link control system establishes the flow in the link and this is able to respond to a number of external signals. There is little doubt that Murraylink could provide greater value to the market, if its capability were more fully utilised.

  Murraylink has initiated discussions with AEMO and the TNSPs with a view to examining these options in greater detail and carrying out the analysis necessary to demonstrate a net benefit to the market

- ***Positive pressure ventilation of Berri and Red Cliffs convertor equipment buildings*** – to reduce the ingress of dust, insects and spiders into the buildings and thereby improve the security of the convertor equipment.

7.8 Proposed contingent capital expenditure project

A number of options to strengthen the interconnection between South Australia and Victoria/NSW are currently under consideration by AEMO, ElectraNet and the other TNSPs.[32] The options currently being investigated do not include upgrade of the Murraylink capacity and Murraylink has held discussions with AEMO, drawing attention to this omission. In addition, Murraylink has commenced a dialogue with AEMO and the TNSPs, in order to ensure that the potential capabilities of the link are fully explored.

The capability of Murraylink is approximately 200 MW in either direction. However, its capacity to provide support to the NEM is currently limited by the capacity of the two regional transmission networks in South Australia and Victoria, to which it is connected.[33] Runback schemes are used to control the link flow, in the event of critical transmission contingency.

The South Australian Riverland area, the north-western Victorian and the south-western NSW regional transmission networks are all nearing the time when they need to be reinforced to meet growing load, as well as to provide for the continued effective contribution of Murraylink. The Annual Planning Reports for ElectraNet, AEMO (Victoria) and TransGrid all describe plans for the staged reinforcement of these regional portions of their networks. [34,35,36]

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32 ElectraNet and AEMO, Joint Feasibility Study - South Australian Interconnector Feasibility Study, February 2011; http://www.electranet.com.au/assets/Uploads/interconnectorfeasibilitystudyfinalnetworkmodellingreport.pdf.

33 ElectraNet and AEMO, Joint Feasibility Study, p.23.

34 Electranet, South Australian Annual Planning Report 2011 Version 1.0, June 2011, http://www.electranet.com.au/assets/Uploads/2011-Annual-Planning-Report.pdf.

Murraylink has developed a conceptual proposal, which would be capable of addressing the capacity constraints in the regional transmission networks as well as providing increased South Australian interconnection capacity. The proposal would increase the capacity of the link by approximately three-fold with the addition of a second, higher capacity link, using the same DC light technology. The proposal would also reinforce the regional transmission networks with conventional AC or DC transmission.

This contingent project is described in the supporting information to this Proposal, in Attachment 7.3. it would involve capital expenditure in the order of $816 to $918 million. This expenditure has not been included in the forecast of capital expenditure in this Proposal. It is foreseen that this development could become justified during the next regulatory control period and accordingly it has been included as a contingent project.

It is proposed that the trigger event for this contingent project will be:

- The completion of a RIT-T consultation and cost–benefit analysis framework that maximises net economic benefit to the market must justify any one, or more than one element of the project to upgrade the capacity of the Murraylink corridor;
- As required under the RIT-T assessment, available network and non-network solutions capable of meeting the identified limitation set out in the Project Assessment Draft Report are considered;
- Murraylink is successful in tendering to develop an element of the contingent project, under the transmission procurement arrangements that currently apply in Victoria tor those that may in future apply to other jurisdictions or across the NEM;
- A financial commitment is made by the board of Energy Infrastructure Investments Pty Limited to undertake an element of the project. This arrangement would ensure that any expenditure committed at the time would reasonably reflect the capital expenditure criteria, and take into account the capital expenditure factors.

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35 AEMO, 2011 Victorian Annual Planning Report - Electricity and Gas Transmission Network Planning for Victoria, p.79, http://www.aemo.com.au/planning/VAPR2011/Chapters.html.

36 TransGrid, New South Wales Annual Planning Report 2011, http://www.transgrid.com.au/network/np/Documents/Annual%20Planning%20Report%202011.pdf.

7.9 Forecast capital expenditure

The forecast capital expenditure required to maintain the prescribed transmission services by Murraylink during the 2013-23 regulatory control period is set out in Table 7.2.

Table 7.2 – Forecast capital expenditure 2013-23 ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2013-23
Refurbishment	0.707	0.271	0.057	0.344	1.347	0.359	0.059	0.077	0.500	1.103	4.823
Compliance	0.861	0.808	0.617	0.016	0.016	0.016	0.016	0.017	0.017	0.017	2.401
Other	2.190	1.965	2.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.363
Total	3.757	3.044	2.882	0.360	1.363	0.375	0.075	0.093	0.516	1.120	13.587

8 Forecast Operating Expenditure

8.1 Introduction

In this Chapter, Murraylink describes its operating expenditure forecasts for the 2013-23 regulatory control period. The operating expenditure categories used in preparing the Revenue Proposal are described below, followed by the methodology used to forecast operating expenditure. The key inputs and assumptions underpinning the forecasts are then explained.

The resulting forecast operating expenditures are set out in the AER's Cost Information template, which forms Attachment 4.1 to this Proposal.

Attachment 7.1 contains an excerpt from the EII Asset Management Plan, which details Murraylink's asset management practices. These represent best practice and include a risk-based approach to addressing the priority of maintenance issues. The continuation of this asset management strategy underpins both the operating and capital expenditure forecasts in this Proposal.

This chapter also describes Murraylink's proposal that the connection costs paid to adjacent TNSPs (and thus beyond Murraylink's control) be subject to an adjustment provision.

8.2 Rules/AER Submission Guidelines requirements

The Rules[37] establish the information and matters relating to operating expenditure that must be provided in Murraylink's Proposal. The principal requirements are that the proposed operating expenditure must:

- Meet the operating expenditure objectives;
- Comply with the AER's Submission Guidelines;
- Be subdivided into particular programs or types of expenditure and identify the fixed and variable components;
- Include a forecast of key variables used to derive the forecast;
- Have Directors' sign off on the reasonableness of key assumptions used in the operating expenditure forecast; and
- Identify any methodology or programs to improve the performance of the transmission network, in relation to the service target performance incentive scheme.

Section 4.3.4(b) of the Submission Guidelines also stipulates the minimum operating expenditure information requirements, which a TNSP must provide in its Revenue Proposal. Murraylink considers that the information in the Sections below meet

[37] AEMC, *National Electricity Rules*, clause 6A.6.6 and schedule S6A.1.2.

these requirements. In addition, Murraylink has prepared and submitted pro forma statements 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6 on forecast operating expenditure.

8.3 Operating expenditure objectives

The operating expenditure that Murraylink has proposed is required to:

- Maintain the full capacity of the link, for the duration of the regulatory control period;
- Continue to comply with the range of applicable regulatory obligations described in Section 2.2;
- Maintain the security of supply of prescribed transmission services, in accordance with its obligations under the Rules; and
- Maintain the reliability, safety and security of the transmission system through the continued supply of prescribed transmission services.

Murraylink's operating expenditure forecast has been prepared in line with the operating expenditure objectives as defined in the Rules[38] and Section 4.3.4(b) of the Submission Guidelines.

Murraylink considers that this Revenue Proposal achieves the operating expenditure objectives, having regard to these factors.

8.4 Operating expenditure categories

The AER's Submission Guidelines require operating expenditure to be presented in well accepted categories, and in a manner consistent with historic operating expenditure. Murraylink's total operating expenditure has a number of components, as follows. These components are to a greater or lesser extent controllable, as outlined below.

Murraylink's choice of operating expenditure categories was influenced by the character of the business and the commercial arrangements which have been developed to carry out operations and maintenance activities.

It must be recognised that unlike most other TNSPs in the NEM, Murraylink has a single transmission interconnection asset with unique and specialised maintenance requirements. That asset comprises a number of separate items of equipment:

- ***Primary equipment:*** (operating at the transmission voltage) comprises the underground cable, the invertors (power conversion between AC and DC), their transformers and filter banks.
- ***Secondary equipment:*** includes the electrical control, protection and communications systems that control the link and are necessary for it to operate; and

[38] AEMC, National Electricity Rules, clause 6A.6.6(a).

- ***Auxiliary equipment:*** includes the water purification and cooling systems, air conditioning and ventilation, also necessary for the link to function.
- ***Land and buildings:*** includes the terminal buildings and depot and storage facilities adjacent to the terminal stations.

The unique features of this asset have had a major influence on the manner in which Murraylink carries out its operating and maintenance activities.

Murraylink's choice of operating expenditure categories is set out below.

8.4.1 Routine

The majority of the routine maintenance activities for Murraylink equipment are currently carried out by Transfield, as a contractor. This contract terminates on 30 June 2012. Murraylink will seek public tenders for a principal maintenance contractor, to continue the maintenance activities from that date. The contract arrangements require the contractor to perform all routine maintenance on the link equipment, in accordance with the manufacturer's recommendations.

Some miscellaneous routine maintenance activities are carried out by Murraylink staff. This represents a minor component of the routine maintenance expenditure.

The materials and spare parts associated with routine maintenance are also included in this category of expenditure.

8.4.2 Fault & condition

A proportion of operation and maintenance activity is occasioned by equipment faults, or where the condition of equipment deteriorates to the point where its maintenance. The majority of such work is carried out by Transfield, the maintenance contractors under the maintenance agreement, but at additional cost.

This category of expenditure also contains the materials and spare parts associated with fault and condition related maintenance.

8.4.3 Operations

Whilst the flow levels of Murraylink are controlled in response to AEMO requirements, the operation of Murraylink is controlled remotely. This control room is manned by shift staff and also used for the control of other assets. Accordingly, Murraylink is charged an allocated cost for the control room.

8.4.4 Corporate support and overheads

The operating and maintenance activities for Murraylink are carried out on behalf of the owner, Energy Infrastructure Investments Pty Limited (EII), by the Operator of the link, APA Operations (EII) Pty Limited (APA Operations). Under an agreement between these two entities, APA Operations carries out the operating and maintenance of a portfolio of gas and electricity assets owned by EII.

APA Operations has engaged a contractor (Transfield) to perform the maintenance of Murraylink, under an agreement that extends until 30 June 2012. Expressions of

interest will be sought and a contractor engaged under a new agreement following the expiry of the existing one.

Murraylink's maintenance costs are therefore subject to competitive tender in the marketplace.

APA Operations recovers these contract costs and its direct overheads, such as rent, electricity and telecommunications from EII on the basis of a Management, Operations and Maintenance and Commercial Services agreement entered into between the parties in 2008.

EII also provides corporate support to Murraylink on the same basis as other assets in its infrastructure portfolio. These support services include IT facilities, legal, accounting and regulatory support.

8.4.5 Connection costs

The connection costs paid to adjacent TNSPs ElectraNet and SP AusNet constitute a very significant component of Murraylink's operating expenditure. These connection costs form part of the regulated revenue of these TNSPs and are due for reset on 1 July 2013 and 1 July 2014 respectively. They will again be reset in 2018 and 2019, during the Murraylink regulatory control period. The connection costs will be reset on those dates and will be subject to the AER's future regulatory decisions.

Murraylink is therefore exposed to a significant risk that this large component of operating cost, which has been estimated as part of this proposal, may vary at these or the subsequent reset.

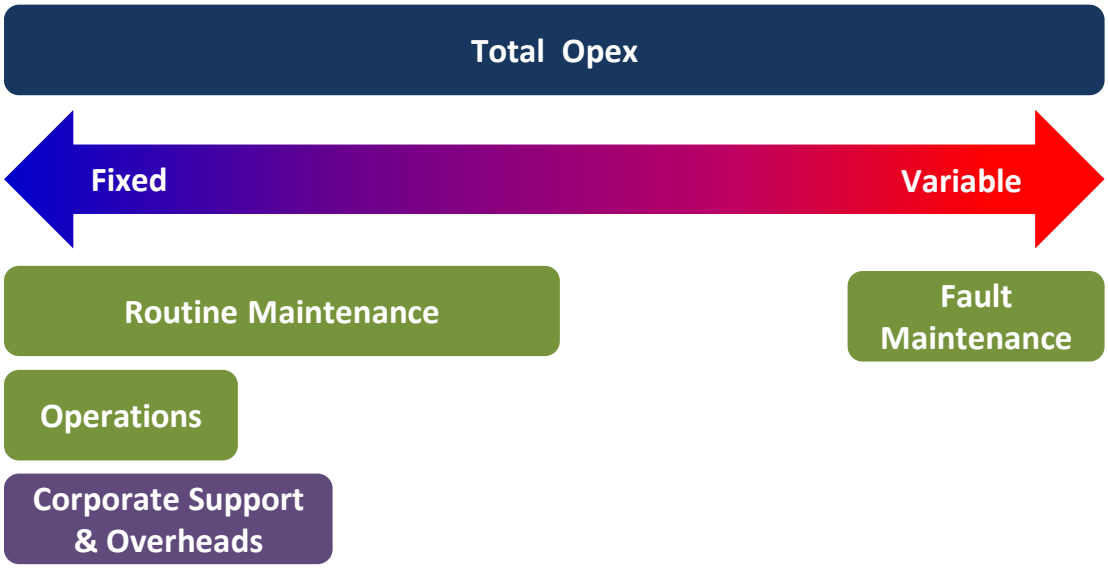
For this reason, Murraylink is proposing that during the 2013-23 regulatory control period, the difference between connection costs estimated in this proposal and those charged by the TNSPs should be subject to an adjustment to Murraylink's annual revenue.

8.4.6 Controllable and non-controllable operating costs

Murraylink is required by the Rules[39] to identify the extent to which the categories of costs above are fixed and the extent to which they are variable. This has been illustrated by the diagram in Figure 8.1.

[39] AEMC, *National Electricity Rules*, clause S6A.1.2

Figure 8.1 – Fixed and variable operating costs



As outlined above, most routine maintenance is carried out for Murraylink by a contractor on the basis of a long-term agreement with fixed costs (subject only to cost indexation). Maintenance in accordance with the manufacturer's recommendations also involves predictable costs for spares and consumables and this category of operating cost is therefore largely fixed.

Fault and condition based maintenance is largely beyond Murraylink's control, being associated with random asset failure or unanticipated deterioration in equipment condition. This component of maintenance costs is variable.

Operations costs (an allocated component of control room costs) are expected to remain fixed for the regulatory control period.

Also included in operations costs are the connection charges levied by ElectraNet on one end and SP AusNet on the other. While Murraylink has no scope to influence these costs, they are subject to separate regulatory oversight through the regulatory proceedings applicable to those transmission networks.

Corporate support and overheads are mainly based on Murraylink's maintenance costs and are therefore expected to remain fixed, as a proportion of maintenance costs, for the regulatory control period.

8.5 Cost escalation

Murraylink obtained expert advice from economics firm BIS Shrapnel on the appropriate real cost escalators to use for the forecasts of Murraylink capital and operating costs. BIS Shrapnel's report forms Attachment 8.1 to this Proposal.

Murraylink has applied the BIS Shrapnel average of Victorian and South Australian productivity-adjusted Average Weekly Ordinary Time Earnings (AWOTE) real cost escalators for the following labour categories:

- Labour (EGWWS - electricity, gas, water and waste services); and
- Contracted services (Construction sector wages growth).

Murraylink considers that these are the most appropriate escalators to use in relation to Murraylink as:

- Murraylink utilises labour resources from both Victoria and South Australia, making it appropriate to apply an average of expected real labour cost movements for these two jurisdictions;
- AWOTE is a better measures of the change in overall costs per employee than other options (for example using the Labour Price Index (LPI)) because it takes into account movements of employees to higher grades, changes in compositional effects from entry/exits of higher skilled/lower skilled (i.e. higher paid/lower paid) workers in an enterprise or industry, and also the payments above base rates of pay, such as bonuses, incentives, penalty rates and other allowances that are a normal part of an employee's earnings over the quarter or year.

  By contrast, LPI only measures underlying wage inflation in the economy or a specific industry, and therefore reflects pure price changes and does not reliably measure the changes in total labour costs which a particular enterprise or organisation incurs, because the LPI does not reflect the changes in the skill levels of employees within an enterprise or industry.

  Further discussion as to the appropriate application of these two labour measures can be found in the BIS Shrapnel real labour cost escalation report and the report prepared for Envestra Pty Ltd by Professor Borland;[40] both of these accompany with revenue proposal.

  The NER require the AER to accept forecast capital and operating expenditure where that expenditure reasonably reflects the efficient costs of achieving the capital and operating expenditure objectives. Murraylink considers that use of the AWOTE measure best reflects efficient labour costs incurred and expected to be incurred in relation to Murraylink, and is therefore the most appropriate measure to use in this revenue proposal;
- Murraylink has adopted productivity-adjusted AWOTE values as it considers that these best reflect expected actual labour costs over the period. The reasons for this approach are discussed further in the BIS Shrapnel real cost escalation report that accompanies this submission (Attachment 8.1).

  Murraylink has reviewed the AER's most recent decision in respect of labour cost escalation (AER draft decision in respect of the Roma to Brisbane Gas Pipeline access arrangement revision proposal) and agrees with the AER's analysis that it is not appropriate to adjust the LPI measure for productivity. It remains appropriate, however to adjust the AWOTE measure for productivity, as discussed in the report prepared by Professor Borland:

[40] Professor Borland 2012, Labour Cost Escalation: Choosing between AWOTE and LPI: Report for Envestra Ltd, March. Attachment 8.2.

The AWOTE measure remains, in my opinion, the best series to be used as the basis for future labour costs.

First, theory and empirical evidence support this opinion. Take the rate of change in AWOTE and subtracting the rate of change in labour productivity gives a measure of labour costs that appropriately adjusts for the effects of labour productivity in a firm's costs.[41]

- Murraylink has adopted the ABS EGWWS labour force series to derive its forecast real cost escalators. This approach adopts the AER's most recent decision in respect of labour cost escalation (AER draft decision in respect of the Roma to Brisbane Gas Pipeline access arrangement revision proposal), which rejected APTPPL's approach of adjusting the EGWWS series to remove waste services.

  While Murraylink remains of the view that skills and price movements associated with the waste services sector are not well aligned with skills and price movements associated with the electricity, gas and water sectors, the adjustment to the escalator to remove waste services represents an additional adjustment to published values and increases the risk of error. Murraylink has therefore applied BIS Shrapnel escalators prepared on the basis of the ABS EGWWS labour force series without adjustment.

  This escalator has been applied to all non-construction/maintenance labour.

- As most contractor labour undertakes construction or maintenance related projects, the escalator used for contractor labour is Construction sector wages growth. BIS Shrapnel's forecasts of construction activity by state (which includes engineering construction, residential and non-residential building) were used to derive these wages forecasts.

While Murraylink considers that its proposal to use an average of Victorian and South Australian productivity-adjusted AWOTE real cost escalators is consistent with the capital and operating expenditure objectives and should be approved by the AER, APA has also included non-productivity adjusted LPI values in the attached BIS Shrapnel report. In the event that the AER does not approve Murraylink's proposed use of productivity-adjusted AWOTE real cost escalators, it considers that the AER should use the non-productivity adjusted LPI values as set out in the BIS Shrapnel report. Murraylink considers that these values have been derived on a reasonable basis and represent the next best option to using productivity-adjusted AWOTE real cost escalators.

One additional cost escalator was used for a significant component of the Murraylink expenditure. Connection charges paid to ElectraNet and SPI AusNet have been escalated by the X factors for the duration of their current regulatory control periods.

The real cost escalators used in developing Murraylink's proposed program operating and capital expenditures are set out in Table 8.1.

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[41] Professor Borland 2012, Labour Cost Escalation: Choosing between AWOTE and LPI: Report for Envestra Ltd, March, p 18

Table 8.1 – Project cost escalators 2013-23 (annual movement, %)

(Information redacted)

8.6 Operating expenditure forecasting methodology

8.6.1 Key inputs and assumptions

The main inputs to the operating cost forecasts are set out below for the categories of cost.

Routine maintenance costs

Contract costs for routine maintenance have been estimated on the basis of the current contract costs and expected minor variations in the extent of the works.

The associated costs and spares and consumables have been based on a review of the scheduled maintenance requirements, drawn from the manufacturer's recommendations.

Non-contract labour costs were estimated from the requirements during the current regulatory control period and assessment of the routine maintenance associated with buildings and auxiliary equipment.

Fault & condition

This cost was estimated on the basis of historic costs for this category of maintenance.

This category of expenditure also contains the materials and spare parts associated with fault and condition related maintenance.

Operations

The allocated cost of the control room and facilities was estimated on the basis of current period costs. The basis of allocation is expected to remain unaltered.

Corporate support and overheads

corporate support and overheads was estimated on the basis of current period costs. The basis of allocation is expected to remain unaltered.

Cost escalation

The cost escalators described in Section 8.5 were used in preparing the operating cost forecasts.

8.7 Forecast operating expenditure

The forecast operating expenditure required to maintain the prescribed transmission services by Murraylink during the 2013-23 regulatory control period is set out in Table 8.2.

Table 8.2 – Forecast operating expenditure 2013-23 ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2013-23
Maintenance	0.879	0.881	0.900	0.910	0.935	0.966	0.984	1.011	1.022	1.053	9.542
Operations and asset management support	2.118	2.128	2.179	2.217	2.279	2.355	2.407	2.475	2.516	2.592	23.27
Non system	0.518	0.513	0.524	0.530	0.545	0.564	0.575	0.591	0.597	0.616	5.57
Debt raising costs	0.068	0.068	0.067	0.067	0.064	0.062	0.059	0.056	0.054	0.051	0.615
Total	3.582	3.589	3.670	3.724	3.823	3.947	4.025	4.133	4.188	4.312	38.995

9 Depreciation

This Chapter sets out how the proposed depreciation allowance for Murraylink was determined.

9.1 Depreciation methodology

The depreciation methodology used is straight-line, over the estimated useful life of the asset concerned. This approach is the same as currently applied.

9.2 Standard asset lives

A change has been made to the standard life of the cables that form a component of Murraylink for the 2013-23 regulatory control period. The switchyard assets (the convertor equipment) were assigned a life of 40 years in the 2013 determination. The cables, however, were assigned a life of 60 years. Unlike a TNSP that has a broad portfolio of assets, the Murraylink asset components work as a single entity to provide prescribed network services.

It is clear that, at the time that the convertor equipment reaches the end of its useful life, no investor would be prepared to renew this equipment to utilise the ageing cable for its short remaining life. For this reason, the Murraylink cable has been assigned the same remaining life as the convertor equipment.

The following estimated useful lives have been used for the calculation of depreciation:

Table 9.1 – Useful life by asset class

Asset class	Useful life
Land and Buildings	
Buildings	40 years
Site improvements	40 years
Transportable office	30 years
Plant and equipment	
Cables	40 years
Converters - transmission equipment	40 years
Converters - electronics and control systems	25 years
Spares	40 years
Other plant and equipment	3 to 20 years

These standard lives are consistent with those used in the regulatory financial statements.

9.3 Remaining asset lives

Murraylink has now been in service for approximately 10 years. The major items of equipment thus have a remaining life of approximately 30 years at the commencement of the 2013-23 regulatory control period. Other operating assets have shorter remaining lives and in the case of many ancillary items of equipment, will be renewed during the next control period.

9.4 Depreciation forecast

The regulatory depreciation has been calculated using the AER's PTRM.

The forecast regulatory depreciation for Murraylink during the 2013-23 regulatory control period is set out in Table 8.2.

Table 9.2 – Forecast depreciation 2013-23 ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Depreciation	1.01	1.33	1.67	2.04	2.22	2.36	2.55	2.76	2.97	2.89

10 Maximum allowable revenue

Murraylink's Revenue Proposal is derived from the post-tax building block approach outlined in the Rules[42] and the AER's PTRM.[43] The completed PTRM forms Attachment 10.1 to this regulatory proposal. This Chapter summarises the building block approach, the components of which are detailed in the preceding Chapters as required under Section 4.3.8 of the Submission Guidelines. The MAR and X factor for Murraylink are calculated from the PTRM. Future adjustments to the revenue cap are also described.

10.1 Building block approach

The building block formula to be applied in each year of the regulatory period is:

MAR = return on capital + return of capital + opex + tax

= (WACC × RAB) + D + opex + tax

Where:

MAR = Maximum Allowable Revenue.

WACC = post-tax nominal weighted average cost of capital ("vanilla" WACC).

RAB = Regulatory Asset Base.

D = Regulatory Depreciation.

opex = operating expenditure.

tax = income tax allowance.

The MAR is then smoothed with an X factor, in accordance with the Rules requirements.[44]

The Rules allow for revenue increments and decrements arising from the Efficiency Benefit Sharing Scheme (EBSS). As the EBSS does not apply to Murraylink, there is no carry over amount to be included in the operating expenditure building block.

Any increment or decrement associated with the Service Target Performance Incentive Scheme (STPIS) is not included in this Revenue Proposal, but as a future revenue cap adjustment.

Similarly, as discussed in section 8.4.5, Murraylink proposes to adjust annually for differences between forecast and actual connection costs.

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42 *National Electricity Rules*, Part C of Chapter 6A, AEMC.

43 AER, Final decision, *Amendment - Electricity transmission network service providers Post-tax revenue model*, December 2010.

44 AEMC, *National Electricity Rules*, Chapter 6A, clause 6A.6.8.

10.2 Building Block components

The building blocks that formed a part of the revenue calculation are set out below.

10.2.1 Regulatory asset base

Chapter 5 described the calculation of the estimated RAB of $102.39 million, as at 1 July 2013.

The capital expenditure forecast in Chapter 7 and was used to roll forward RAB, using the expected regulatory depreciation detailed in Chapter 9. The RAB for the next regulatory control period is set out in Table 10.1.

Table 10.1 – Summary of RAB ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Opening Asset Base	102.40	105.35	107.32	108.85	107.22	106.60	104.69	102.23	99.59	97.30
Capex	3.97	3.30	3.20	0.41	1.60	0.45	0.09	0.12	0.67	1.49
Depreciation	-3.70	-4.09	-4.48	-4.89	-5.02	-5.16	-5.29	-5.43	-5.58	-5.44
Indexation	2.68	2.76	2.81	2.85	2.81	2.79	2.74	2.68	2.61	2.55
Closing Asset Base	105.35	107.32	108.85	107.22	106.60	104.69	102.23	99.59	97.30	95.89

10.2.2 Return on capital

The return on capital was calculated by applying the post-tax nominal vanilla WACC to the opening RAB in the respective year.

The post-tax nominal vanilla WACC of 8.61% was established using the methodology detailed in Chapter 6. Murraylink has calculated the return on capital in using the PTRM. This calculation is summarised in Table 10.2.

Table 10.2 – Summary of return on capital forecast ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Return on capital	8.81	9.07	9.24	9.37	9.23	9.18	9.01	8.80	8.57	8.37

10.2.3 Return of capital

Chapter 9 describes how Murraylink has calculated the return of capital provided by depreciation. The AER's PTRM combines both the straight line depreciation and an adjustment for inflation on the opening RAB. A summary of the regulatory depreciation allowance is given in Table 10.3.

Table 10.3 – Summary of regulatory depreciation ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Regulatory depreciaton	1.01	1.33	1.67	2.04	2.22	2.36	2.55	2.76	2.97	2.89

10.2.4 Operating expenditure

Chapter 8 of this revenue Proposal details Murraylink's requirement for operating expenditure requirements in each year of the next regulatory period. This is summarised in Table 10.4.

Table 10.4 – Summary of forecast operating expenditure ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2013-23
Maintenance	0.879	0.881	0.900	0.910	0.935	0.966	0.984	1.011	1.022	1.053	9.542
Operations and asset management support	2.118	2.128	2.179	2.217	2.279	2.355	2.407	2.475	2.516	2.592	23.266
Non system	0.518	0.513	0.524	0.530	0.545	0.564	0.575	0.591	0.597	0.616	5.572
Debt raising costs	0.068	0.068	0.067	0.067	0.064	0.062	0.059	0.056	0.054	0.051	0.615
Total operating expenditure	3.582	3.589	3.670	3.724	3.823	3.947	4.025	4.133	4.188	4.312	38.995

10.2.5 Tax allowance

The tax allowance associated with the RAB is outlined in Section 6.7. The forecast tax allowance is summarised in Table 10.5.

Table 10.5 – Summary of tax allowance 2013-23 ($M nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Taxation allowance	0.26	0.28	0.29	0.31	0.32	0.34	0.35	0.36	0.38	0.38

10.3 Maximum Allowable Revenue

As required by the Section 4.3.8 of the Submission Guidelines, the total revenue cap and the MAR for each year of the next regulatory period is provided below. Based

on the building blocks outlined in the previous Section, the total revenue cap and maximum allowable unsmoothed revenue requirement is summarised in Table 10.6.

Table 10.6 – Summary of unsmoothed revenue requirement ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Return on capital	8.81	9.07	9.24	9.37	9.23	9.18	9.01	8.80	8.57	8.37
Return of capital	1.01	1.33	1.67	2.04	2.22	2.36	2.55	2.76	2.97	2.89
Total operating expenditure	3.67	3.77	3.95	4.11	4.33	4.58	4.78	5.04	5.23	5.52
Tax allowance	0.26	0.28	0.29	0.31	0.32	0.34	0.35	0.36	0.38	0.38
Unsmoothed revenue requirement	13.76	14.45	15.15	15.83	16.09	16.45	16.70	16.95	17.15	17.17

10.4 X-Factor smoothed revenue

As required in Section 4.3.12 of the Submission Guidelines, the Revenue Proposal must contain the X factors nominated for each year of the regulatory period and that the X factors comply with the Rules. A net present value (NPV) neutral smoothing process is applied to the building block unsmoothed revenue requirement, while ensuring the expected MAR for the last regulatory year is as close as reasonably possible to the annual building block revenue requirement. The associated X factors are presented in Table 10.7.

Table 10.7 – Smoothed revenue requirement and X factor ($million, nominal)

FY ending	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Unsmoothed revenue requirement	13.76	14.45	15.15	15.83	16.09	16.45	16.70	16.95	17.15	17.17
Smoothed revenue requirement	14.77	15.01	15.25	15.49	15.74	15.99	16.24	16.50	16.76	17.03
X factor	-1.67%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

10.5 Revenue cap adjustments

In accordance with the Rules,[45] Murraylink's revenue cap determination by the AER is in the CPI-X format, and may be subject to adjustment during the next regulatory period for the following reasons:

- ***Adjustment for actual CPI*** - Murraylink's revenue cap will be calculated each year using the actual CPI.

[45] AEMC, National Electricity Rules, Chapter 6A.5.3.

- ***Adjustment for actual connection charges*** – Murraylink's revenue cap will be adjusted by the difference between forecast and actual connection charges.
- ***STPIS*** – Murraylink's revenue cap will be adjusted by the impact of the STPIS as discussed in section 11;
- ***Contingent project*** – A contingent project has been included in Section 7.7 of this Revenue Proposal. If the trigger event for a contingent project occurs, then Murraylink will lodge an application to the AER requesting a revised MAR stream in accordance with the Rules.[46]

[46] AEMC, National Electricity Rules, Chapter 6A, clause 6A.8.2,

11 Service Target Performance Incentive Scheme

11.1 Introduction

The NER requires this Proposal to contain:[47]

(a) The values, weightings and other elements that Murraylink proposes for the performance incentive scheme parameters during the new regulatory control period; and

(b) An explanation of how those proposed values, weightings and other elements with any requirements set out in the scheme.

In common with other TNSPs, Murraylink is subject to the AER's Service Target Performance Incentive Scheme (STPIS).[48] The scheme has been used by the AER during the current regulatory control period, to determine financial penalties and rewards for Murraylink's service performance.

The scheme comprises two elements:

- The service component; and
- The market impact component.

These components, their parameters, Murraylink's historical performance under the scheme and the proposed operation of the scheme during the 2013-23 regulatory control period, are discussed in the following Sections.

11.2 Service component - transmission circuit availability

There are three parameters associated with the service component of the STPIS:

- Transmission circuit availability;
- Loss of supply event frequency; and;
- Average outage duration

11.2.1 Parameters and targets

Murraylink's performance is subject to the first of these parameters, with the following modifications:[49]

(a) Replace the sub-parameters in the standard definition with the following sub-parameters:

(i) planned circuit availability

(ii) forced peak circuit availability

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47 AEMC, *National Electricity Rules*, clause S6A.1.3(2), schedule 6A.1.

48 AER, *Electricity transmission network service providers Service Target Performance Incentive Scheme,* March 2011.

49 Ibid, p.46.

(iii) forced off-peak circuit availability

(b) Exclude outages needed to replace transformers where:

(i) the replacement of the transformer was needed

(ii) the time taken to replace the transformer was needed, and

(iii) the AER is satisfied that the replacement was the best alternative and all reasonable preventative measures have been taken.

The performance targets that have been agreed by the AER are set out in Table 11.1.

Table 11.1 – STPIS performance targets

No	Measure	Performance for Maximum Penalty	Target Performance	Performance for Maximum Bonus	Weighting Factor
1a	Planned circuit availability	99.04%	99.17%	99.38%	0.40
1b	Forced outage circuit availability in peak periods	98.90%	99.48%	100.00%	0.40
1c	Forced outage circuit availability in off-peak periods	98.84%	99.34%	99.94%	0.20

The maximum annual adjustment to revenue, to which Murraylink is exposed, is ±1% of the maximum allowable revenue in any calendar year.

11.2.2 Performance during current regulatory control period

Calendar year 2010 is the most recently available full year of data on Murraylink's performance under the STPIS. The performance against the three target parameters established by the AER and the overall bonus/penalty as a percentage of the maximum annual revenue is set out in Table 11.2.

Table 11.2 – Performance against service target levels (after exclusions)

Year	2004	2005	2006	2007	2008	2009	2010	2011
Target planned availability	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%	99.17%
Actual planned availability	98.75%	98.18%	99.11%	99.32%	99.22%	99.31%	99.58%	99.11%
Difference	0.42%	0.99%	0.06%	-0.15%	0.05%	0.14%	0.41%	-0.06%
Target forced peak availability	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.48%	99.17%
Actual planned availability	98.89%	99.63%	99.76%	96.42%	99.99%	100.00%	100.00%	99.8%
Difference	0.59%	-0.15%	-0.28%	3.06%	0.51%	0.52%	0.52%	-0.59%
Target forced o/p availability	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.34%	99.3%
Actual forced o/p availability	99.38%	99.72%	99.91%	94.69%	99.95%	100.00%	100.00%	99.9%
Difference	-0.04%	-0.38%	-0.57%	4.65%	0.61%	0.66%	0.66%	-0.57%
S-factor bonus/penalty	**-0.79%**	**0.15%**	**0.18%**	**-0.32%**	**0.69%**	**0.87%**	**1.00%**	**0.007**

There is year on year variation in performance against each of the target service parameters and in the bonus and penalty outcomes. However, it is apparent that the average performance to date during the regulatory control period has been close to the target level. This leads Murraylink to conclude that the current performance standards used in the scheme broadly match reasonably achievable levels of service performance.

11.2.3 Proposed service target levels for 2013-23

Murraylink accepts that the AER will continue to impose its STPIS during the 2013-23 regulatory control period.

During the new regulatory control period, Murraylink does not anticipate that the service performance of the link will vary materially from current levels. The component assets are nearing the mid period of their useful lives and some ancillary items will be refurbished or replaced. However, all equipment maintenance is currently carried out by a contractor according to the manufacturer's recommendations on service intervals and needs.

Murraylink therefore anticipates there will be very limited opportunity to vary average levels of service performance during the new regulatory control period.

Accordingly, Murraylink proposes that the values, weightings and elements of the STPIS be retained unchanged for the 2013-23 period. These values, weightings and elements comply with the requirements of the scheme.

11.3 Market impact component

Murraylink is not currently subject to the market impact component of the STPIS, although the AER has indicated in the most recent determination on the matter that it was its intention to impose this component on 1 July 2013.[50]

The market impact component is a positive incentive only intended to provide an incentive for TNSPs to schedule outages and maintenance at times when the market impact is low.

Murraylink is concerned that rescheduling maintenance would impose substantial additional costs, due the remoteness of the link and the high costs of travel and accommodation for staff and plant engaged in maintenance. Nevertheless, Murraylink will review its maintenance arrangements in order to determine whether the incentive provided by the market impact component exceeds the marginal costs of disruption to planned work.

[50] AER, *Electricity transmission network service providers Service Target Performance Incentive Scheme*, March 2011, p.3.

12 Negotiating Framework and Pricing Methodology

This Section describes how Murraylink's revenue Proposal complies with the requirements of the Rules and the AER's Submission Guidelines concerning the Negotiating Framework and Pricing Methodology.

12.1 Negotiating framework

Part D of Chapter 6A of the Rules and Section 5 of the Submission Guidelines set out the information that must be provided in a TNSP's Negotiating Framework.

Murraylink is unlike a conventional transmission network, where the network may be accessed at multiple locations, and where the terms and conditions of that access are negotiated. There are, and will remain, only two terminal locations where the link is connected to the adjacent transmission networks. Access to the capacity of Murraylink through these two locations is a prescribed transmission network service and is the subject of this revenue Proposal.

There are currently no negotiated transmission services associated with Murraylink, and no potential for such services to be developed in future; a Negotiating Framework is not required. However, the Rules do not appear to provide an exemption for Murraylink, and a proposed Negotiating Framework is provided at Attachment 12.1.

12.2 Pricing methodology

Rule 6A.10.1(a) requires the TNSP to submit a *Pricing Proposal* with its Revenue proposal. Rule 6A.10.1(e) requires that *Pricing Proposal* to:

(1) give effect to and be consistent with the Pricing Principles for Prescribed Transmission Services; and

(2) comply with the requirements of, and contain or be accompanied by such information as is required by, the pricing methodology guidelines made for that purpose under rule 6A.25.

The requirements for a Pricing Methodology are set out in Part J of Chapter 6A the NER.

For the purpose of transmission pricing, Murraylink is included within the South Australian and Victorian Regions. ElectraNet has been appointed the Co-ordinating Network Service Provider for the South Australian Region, and AEMO for the Victorian Region, in accordance with clause 6A.29.1(a) of the NER.

Murraylink annually provides details of its Aggregate Annual Revenue Requirement (AARR) to ElectraNet and AEMO, who carry out the pricing allocation for their respective Regions, in accordance with the NER. The transmission prices so produced recover the revenues of both ElectraNet and Murraylink in South Australia,

and SP AusNet and Murraylink in Victoria. ElectraNet and AEMO pass through the Murraylink component, on a monthly basis in accordance with Rules 6A.27.4 and 6A.27.5.

ElectraNet's prices, of which Murraylink's costs are a component, are prepared in accordance with its Pricing Methodology.[51] Similarly, SP AusNet's prices, of which Murraylink's costs are a component, are prepared in accordance with its Pricing Methodology.

While Murraylink submits that there is no need for it to prepare a separate Pricing Methodology, the Rules do not provide it an exemption from filing a Pricing Methodology with its Revenue Proposal. A Pricing Methodology is therefore included as Attachment 12.2.

In accordance with the Rules,[52] Murraylink's revenue cap determination by the AER is in the CPI-X format. Murraylink will adjust the AARR during the regulatory period for the following reasons:

- ***Adjustment for actual CPI*** - Murraylink's revenue cap will be calculated each year using the actual CPI.
- ***Adjustment for actual connection charges*** – Murraylink's revenue cap will be adjusted by the difference between forecast and actual connection charges.
- ***STPIS*** – Murraylink's revenue cap will be adjusted by the impact of the STPIS as discussed in section 11;
- ***Contingent project*** – A contingent project has been included in Section 7.7 of this Revenue Proposal. If the trigger event for a contingent project occurs, then Murraylink will lodge an application to the AER requesting a revised MAR stream in accordance with the Rules.[53]

51 ElectraNet, *Revised Proposed Pricing Methodology - 1 July 2008 to 30 June 2013* Version 1.0, 3 April 2008.

52 AEMC, National Electricity Rules, Chapter 6A.5.3.

53 AEMC, National Electricity Rules, Chapter 6A, clause 6A.8.2,