APPENDIX H

Revised Materials Escalation Forecast for Upcoming Regulatory Period to July 2017

December 2011

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FINAL REPORT

- Document No. QH10358-0000-OSR-RP-E4-0001
- Rev 0
- 12 December 2011

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Limitation Statement

SKM has prepared these projections using a methodology approved by the Australian Energy Regulator during in recent final decisions for the Queensland electricity distribution businesses. The modelling and outcomes generated are an opinion based on reasonable investigation as to a future event and is inherently subject to uncertainties and external economic factors. Some assumptions used to develop the model and outcomes may not be realised and unanticipated events and circumstances may occur. SKM accepts no responsibility or any liability for any errors, omissions or resultant consequences including any loss or damage arising from reliance on information in this publication. These forecasts represent the authors' opinion regarding a reasonable expectation of the likely outcomes, based on the most recent data publically available at the time of production.

SKM has used a number of publicly available sources, other forecasts it believes to be credible, and its own judgement and estimates as the basis for developing the cost escalators contained in this report. The actual outcomes will depend on complex interactions of policy, technology, international markets, and multiple suppliers and end users, all subject to uncertainty.

Expert Witness Compliance statement

In providing the materials cost escalators contained within this report, SKM has read and agreed to be bound by the guidelines for expert witnesses in proceedings in the Federal Court of Australia, as published by Chief Justice M.E.J. Black on 5th May 2008[1]

In providing consultative services in other assignments, SKM acknowledges a pre-existing relationship with Powerlink, but is confident such relationships do not compromise SKM's objectivity in defending its professional opinion based on specialised knowledge and capabilities held in the area of developing materials cost escalation rates for the Australian electricity industry.

[1] Available as a download from: http://www.fedcourt.gov.au/how/prac_direction.html#current

Executive Summary

Sinclair Knight Merz was engaged by the Queensland Electricity Transmission Corporation Limited (Powerlink Queensland) to establish materials escalation factors for the period between financial year 2011 and financial year 2017 which will be used to support Powerlink Queensland's proposal for the 1 July 2012 to 30 June 2017 regulatory control period.

In previous decisions for electricity network service providers, including electricity distribution and transmission utilities, the Australian Energy Regulator has allowed for costs related to capital and operating expenditure to be escalated in real terms. Prior to these decisions the Australian Consumer Price Index was used by the Australian Energy Regulator to represent cost escalation in relation to network material costs.

The method accepted by the Australian Energy Regulator in these recent decisions sought to model the change in equipment prices and project costs through combining independent forecast movements in the price of input commodities, with weightings for relative contribution of each commodity to the final equipment and project cost. This in turn generated real cost forecasts for the regulatory control period under review.

In developing its forecast escalation rates for Powerlink Queensland's drivers of annual materials costs, Sinclair Knight Merz has maintained consistency with the method for modelling cost escalation as accepted by the Australian Energy Regulator in most of its recent decisions.

The escalation factors presented in this report are specific to the operating environment faced by Powerlink Queensland, and is based on the most recent information available at the time of preparation.

Sinclair Knight Merz has provided an outlook of the cost driver pricing movements in United States dollars.

Table 1 below presents the United States dollar forecast escalation rates for the underlying drivers of network infrastructure plant and equipment costs.

Table 1 Average annual US$ based real change in underlying network material cost drivers

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Aluminium	7.2%	15.7%	-7.4%	-0.8%	1.1%	0.0%	-0.2%	-0.3%
Copper	35.4%	27.0%	-12.3%	-6.5%	-2.6%	-4.2%	-4.5%	-4.6%
Steel Avg.	-15.2%	20.5%	5.8%	-0.8%	-1.5%	-2.1%	-1.8%	-1.8%

1. Introduction

Sinclair Knight Merz (SKM) was engaged by the Queensland Electricity Transmission Corporation Limited (Powerlink Queensland) to update previously supplied materials escalation factors for the period between financial year 2010 and financial year 2017.

Powerlink Queensland's current regulatory control period is due to expire on 30 June 2012. In accordance with the National Electricity Rules (NER), Powerlink Queensland has submitted its Regulatory Proposal for the upcoming regulatory control period to the Australian Energy Regulator (AER) on 31 May 2011. The draft determination by the AER is scheduled to be publicly available on 30 November 2011.

Regulatory Proposals are prepared by developing forecasts of capital and operating expenditure over the next regulatory period. An integral step to developing suitable forecasts for annual capital and operating budgets is the development of annual material cost escalations that reflect the forecast movements in the cost of materials for the forthcoming regulatory control period.

SKM has been actively researching the increasing cost of capital infrastructure works, particularly in the electricity industry, and has developed a cost escalation modelling process which captures the impact of forecast movements of specific input cost drivers on future electricity infrastructure pricing, providing robust cost escalation rates.

The escalation factors presented in this report represent SKM's account of the predicted movement in underlying drivers affecting the cost of undertaking capital and operating works over the period June 2012 to June 2017.

The escalation factors presented are based on the most up-to-date information available at the time of compilation.

2. Objectives and Scope

2.1. Objective

The objective of this report is to update the materials cost escalation factors provided to Powerlink Queensland used to support their Regulatory Proposal submitted in May 2011. The process undertaken by SKM included:

- Review of the materials cost escalations factors previously provided.
- Review the movements in actual and forecast material prices from May 2011 to present.
- Generation of updated materials cost escalation factors.

2.2. Scope

The scope of this report is to review the actual materials cost escalation factors for the 2011 financial year and update the forecast escalations through to the end of financial year 2017 in United States dollars.

The materials cost escalation factors are for:

- Aluminium
- Copper
- Steel (hot rolled coil)

3. Method

The method used by SKM to update the materials cost escalation factors in this report was the same as used in the SKM report supplied to Powerlink Queensland in May 2011. Actual prices and updated materials price forecasts for the five months since the original report was issued have been included for this update. The most recent forecast available from Consensus Economics was issued on 28 October 2011.

3.1. Aluminium and Copper

As per the previous report supplied to Powerlink Queensland, SKM used the following process to generate the materials cost forecasts for aluminium and copper:

1) Plot the average 30 days of LME spot prices for each commodity
2) Plot the average 3 month LME futures contract price for each commodity
3) Plot the average 15 month LME futures contract price for each commodity
4) Plot the average 27 month LME futures contract price for each commodity
5) Plot the Consensus Economics long term forecast position (taken as 90 months from survey date[2])
6) Apply linear interpolation between the plot points
7) Identify the corresponding year to June points in the interpolated results and feed the prices into the model.

3.2. Steel

As per the previous report supplied to Powerlink Queensland, SKM used the Consensus Economics forecast and historical data from Bloomberg and MEPS to generate the materials cost forecast. The Consensus forecasts provide a quarterly forecast price in the short term and a long term (5 to 10 year) nominal position that covers the future regulatory period.

[2] The Consensus Economics long term forecast position is listed in the publication as a 5 to 10 year position. In an attempt to apply this in a reasonable manner SKM consider the position to refer to the mid-point of this range being 7.5 years or 90 months hence.

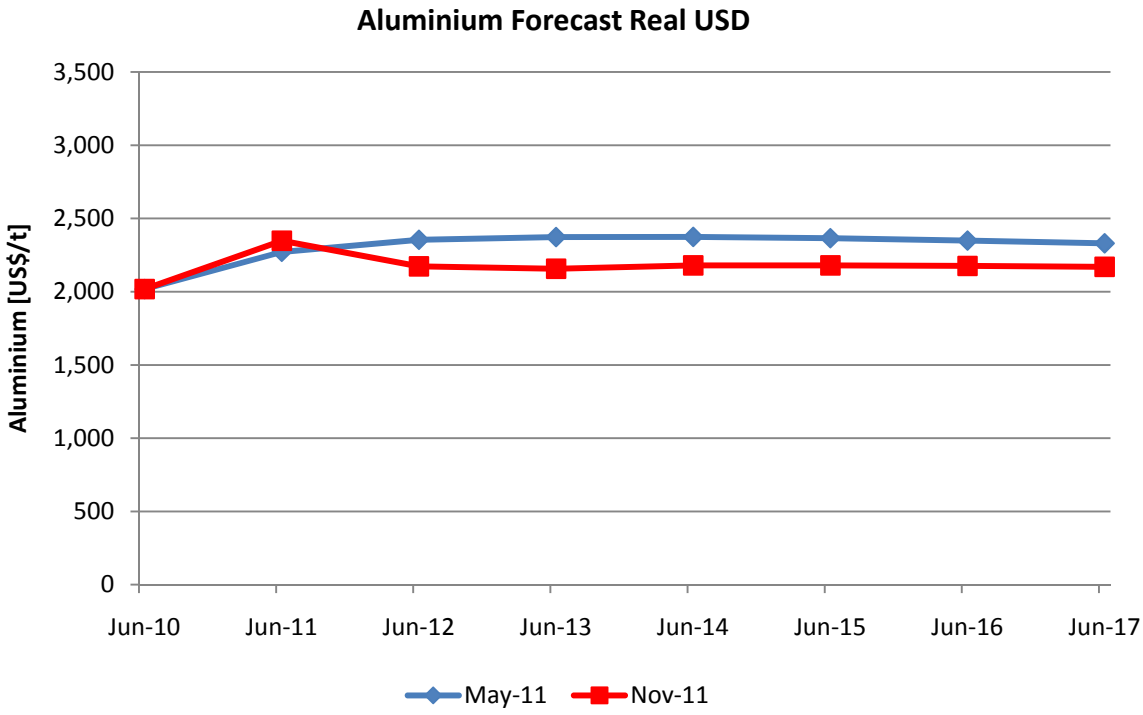
4. Forecast Update

4.1. Aluminium

- **Table 2 Relative real United States dollar based price of aluminium**

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
May-2011	$2,018	$2,272	$2,354	$2,373	$2,374	$2,365	$2,349	$2,330
Nov-2011	$2,018	$2,348	$2,173	$2,157	$2,180	$2,180	$2,176	$2,170
Change between forecasts	0%	3%	-8%	-10%	-9%	-8%	-8%	-7%
Nov-2011 Annual change	7%	16%	-7%	-1%	1%	0%	0%	0%

- **Figure 1 May 2011 to November 2011 aluminium forecast comparison (USD)**

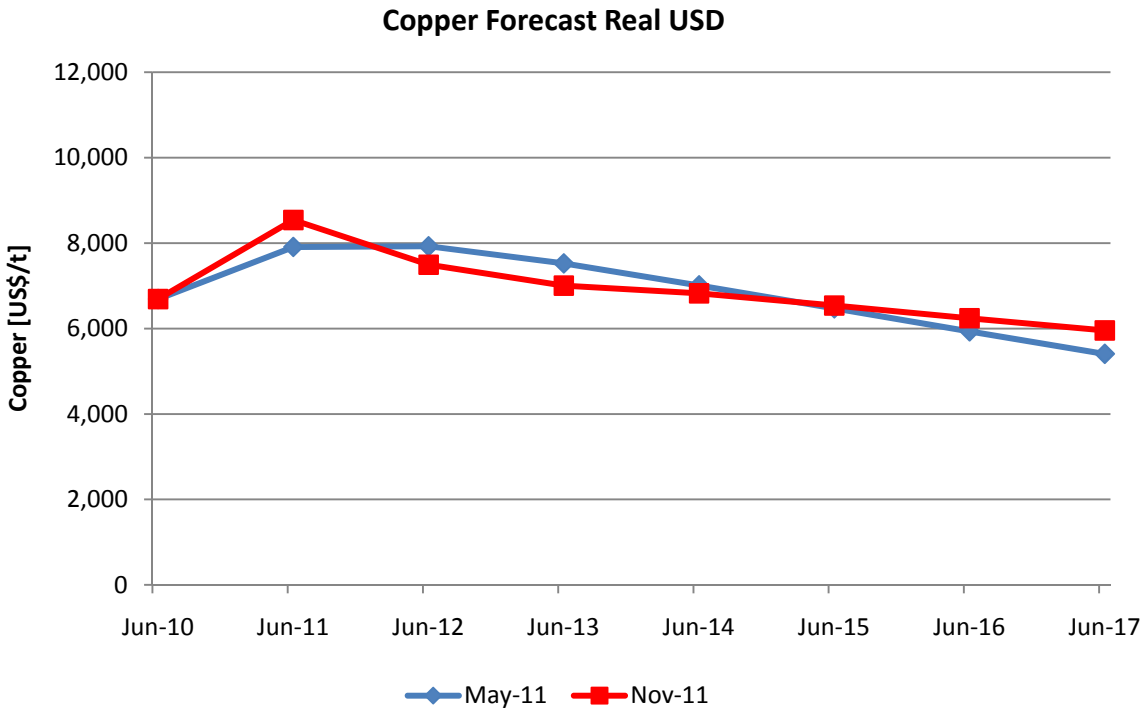


4.2. Copper

- **Table 3 Relative real United States dollar based price of copper**

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
May-2011	$6,691	$7,909	$7,926	$7,524	$7,010	$6,473	$5,934	$5,407
Nov-2011	$6,691	$8,541	$7,494	$7,006	$6,826	$6,539	$6,242	$5,955
Change between forecasts	0%	7%	-6%	-7%	-3%	1%	5%	9%
Nov-2011 Annual change	35%	27%	-12%	-7%	-3%	-4%	-5%	-5%

- **Figure 2 May 2011 to November 2011 copper forecast comparison (USD)**

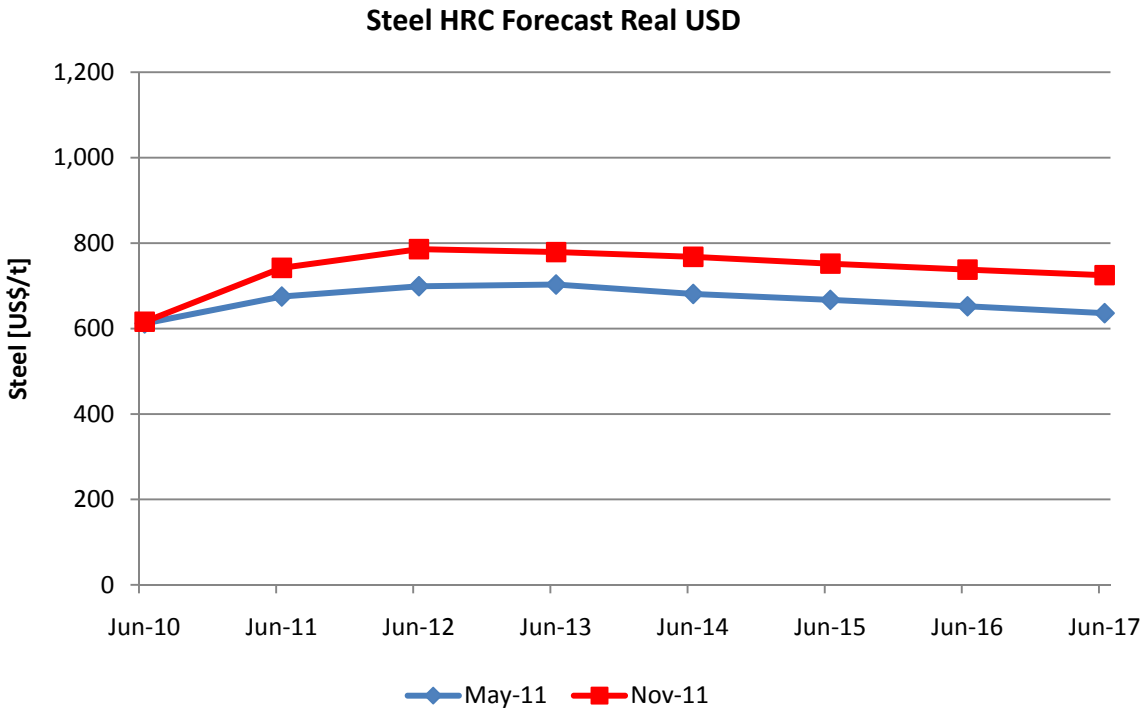


4.3. Steel

- **Table 4 Relative real United States dollar based price of hot roll coil steel**

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
May-2011	$612	$675	$699	$703	$681	$667	$652	$636
Nov-2011	$616	$742	$786	$779	$768	$752	$738	$725
Change between forecasts	0%	9%	11%	10%	11%	11%	12%	12%
Nov-2011 Annual change	-15%	21%	6%	-1%	-1%	-2%	-2%	-2%

- **Figure 3 May 2011 to November 2011 steel forecast comparison (USD)**



5. Conclusion

The escalation factors presented in this report are specific to the operating environment faced by Powerlink Queensland, and is based on the most recent information available at the time of preparation.

Sinclair Knight Merz has provided an outlook of the cost driver pricing movements in United States dollars.

Table 10 below presents the United States dollar forecast escalation rates for the underlying drivers of network infrastructure plant and equipment costs.

Table 5 Average annual US$ based real change in underlying network material cost drivers

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Aluminium	7.2%	15.7%	-7.4%	-0.8%	1.1%	0.0%	-0.2%	-0.3%
Copper	35.4%	27.0%	-12.3%	-6.5%	-2.6%	-4.2%	-4.5%	-4.6%
Steel Avg.	-15.2%	20.5%	5.8%	-0.8%	-1.5%	-2.1%	-1.8%	-1.8%

Appendix A Team CVs

On request from Powerlink, SKM has included a summary CV for staff that undertook the key tasks within the assignment.

Jeff Butler – Project Manager

Jeff Butler is a qualified and experienced electrical engineer with more than 16 years professional experience in the industrial and electrical contracting industry. Jeff spent 11 years with Golden Circle in Brisbane, rising to the position of Engineering Services Manager. Since joining SKM, Jeff has developed an estimating and asset valuation database covering all aspects of costing for distribution and transmission works from LV and streetlight assets, up to transmission assets at 400kV.

Since joining SKM, Jeff has developed an estimating and asset valuation database covering all aspects of costing for distribution and transmission works, and has participated in asset valuations for electricity transmission and distribution utilities throughout Australia and New Zealand. He has participated in a due diligence studies for SP AusNet and Murraylink. He was involved in the development of a performance incentive scheme for the AER relating to the service standards of Transmission Network Service Providers (TNSPs) in Australia. He has been the principal auditor and project manager for the annual audit of transmission companies' performance against regulated service standards for the AER since 2004. He was also recently involved in undertaking a post implementation review of maintenance practices for Powercor Australia and the progress audit of the ENERGEX Annual Network Management Plan.

Jeff was involved in the original SKM development of forecast cost escalation factors for SP AusNet as part of their regulatory submission in 2007, and has continued to be involved in the development and application of these factors for capital expenditure forecasting for both electricity transmission and distribution utilities.

Jeff undertook reviews of the draft and final reports.

John Reddel – Cost Modelling

John has a Bachelor of Engineering (Mechanical) and a Bachelor of Economics degree. His roles within the Power Generation Group of the Queensland Power and Energy Operations Centre involve assisting with project feasibility studies, technical and financial due diligence studies (within Australia and internationally), economic and commodity market research, and power generation studies. John has also assisted with the development of Rapid Cost Benefit Analysis as a part of wider SKM economic and environmental impact studies. Relevant experience includes cost escalation modelling for various Transmission and Distribution Network Service Providers for

regulatory approval by the AER. John holds substantial cost escalation modelling experience of particular relevance to this assignment.

John undertook market research, cost escalation development, cost modelling and report writing tasks within the project.

Ben Kearney – Technical Review

Ben Kearney is SKM's Practice Leader for Utility Management, Regulatory and Market advice.

An associate of SKM, Ben holds qualifications in engineering and business, and has 15 years experience in the Australian electricity industry, including network planning, design and construction, regulatory management, pricing and tariff analysis. Ben's areas of expertise include policy and regulation, financial analysis, business case development, complex modelling and project analysis, greenhouse gas and renewable energy regulation and trading schemes, and demand side management.

Specific projects Ben has conducted include development and codification of a greenhouse gas trading scheme in NSW, audit and review of implementation of the National Electricity Market, asset valuations, load forecast and capital budget estimates and reviews, long term capital and operating cost projections for distribution companies. He has audited reliability and reporting of transmission companies. He has developed optimal reliability improvement programs for utilities, assisted in the development of analysis and regulatory submissions to justify new network capital investments, and developed a number of business cases for new industrial project investments in the cement and coal industries.

Ben provided technical advice and input to the design of modelling methodologies, assisting to ensure technical validity, as well as adherence to AER Regulatory requirements where appropriate.

Appendix B Reference Material

- **Table 6 Aluminium and Copper price forecast reference material**

Date	Source	Aluminium [USD/t]	Copper [USD/t]
Oct-2011	LME Month Average Spot Price	$2,171.85	$7,347.11
Jan-2012	LME +3 Month Average Contract Price	$2,200.78	$7,365.57
Jan-2013	LME +15 Month Average Contract Price	$2,277.36	$7,393.33
Jan-2014	LME +27 Month Average Contract Price	$2,357.88	$7,377.38
Apr-2019	Consensus Economics Long Term Nominal Forecast	$2,633.36	$6,523.75

- **Table 7 Steel HRC price forecast reference material**

Date	Source	Steel HRC US [USD/t]	Steel HRC Europe [USD/t]
Oct-2011	Consensus Economics Spot Price	$839.43	$767.30
Dec-2011	Consensus Economics +2 Month Forecast	$849.43	$767.30
Mar-2012	Consensus Economics +5 Month Forecast	$845.14	$773.90
Jun-2012	Consensus Economics +8 Month Forecast	$865.40	$802.20
Sep-2012	Consensus Economics +11 Month Forecast	$845.73	$798.20
Dec-2012	Consensus Economics +14 Month Forecast	$839.97	$795.00
Mar-2013	Consensus Economics +17 Month Forecast	$850.98	$782.50
Jun-2013	Consensus Economics +20 Month Forecast	$863.82	$795.40
Sep-2013	Consensus Economics +23 Month Forecast	$874.54	$797.10
Dec-2013	Consensus Economics +26 Month Forecast	$858.24	$786.10
Mar-2014	Consensus Economics +29 Month Forecast	$866.93	$785.60
Apr-2019	Consensus Economics Long Term Nominal Forecast	$859.75	$840.72

Appendix C Recent Work for Powerlink

Since 2010, SKM has undertaken the following assignments for Powerlink.

Date

June 2010

Project

Transmission Line Corridor Selection

Description

Provide corridor and preliminary alignment selection for proposed 132kV transmission lines within Central Region, QLD.

Date

May 2011

Project

Cost Escalation Factors

Description

As part of the Revenue Proposal to the AER for 2012/13-2016/17, Powerlink is considering the application of commodity escalation factors to the modelling of future capex and opex. Project is to provide an independent recommendation of the escalation factors to be applied

Date

August 2011

Project

Asset Flood Vulnerability Assessment

Description

Case study on the vulnerability of Powerlink's assets (lines, towers and substations) to flooding in all of Queensland.

C.1 Pre-existing Relationship Statement

The contribution made by SKM for the 2012/13 – 2016/17 Regulatory Proposal was limited to the generation and subsequent update of cost escalation factors to be used in the forecasting of future operational and capital expenditure.