APPENDIX I

US$ Based Cost Escalation Factors for Upcoming Regulatory Period to June 2017

March 2011

US$ based Cost Escalation Factors for Upcoming Regulatory Period to June 2017

- Final (Version 1.1)
- 28 March 2011

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Contents

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

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1. Executive Summary

Sinclair Knight Merz (SKM) was engaged by the Queensland Electricity Transmission Corporation Limited (Powerlink Queensland) to establish materials escalation factors for the period between 2010/2011 to 2016/17 which will be used to support Powerlink's proposal for the 2012/13 to 2016/17 regulatory control period.

In previous decisions for electricity network service providers, including, electricity distribution and transmission utilities (DNSP's and TNSP's), the AER has allowed for costs related to capital and operating expenditure to be escalated in real terms. Prior to these decisions, Australian CPI was the rate used by the AER to represent escalation in relation to network material costs.

The methodologies accepted by the AER in these recent decisions sought to model the changing price of equipment and project costs through combining independent forecast movements in the price of input components, with 'weightings' for the relative contribution of each component to final equipment/project costs. 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, SKM has maintained consistency with the methodology for modelling cost escalation as accepted by the AER in its most recent decisions.

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

Recognising the volatility of the AUD / US$ exchange, and the associated low confidence in forecasting for the forward positions of the exchange rate, SKM was asked to provide an outlook of cost driver pricing movements in US$ terms. The intention is that these escalation rates would be updated and have current forecasts for exchange rate positions applied, in order to determine the AUD based equivalent escalation rates, closer to the time of Powerlink's submission to the AER.

Table 1 below presents the forecast US$ based escalation rates for the underlying drivers of network infrastructure plant and equipment costs.

- **Table 1 Average annual US$ based real change in underlying network materials cost drivers**

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Aluminium	7.2%	12.6%	3.6%	0.8%	0.0%	-0.4%	-0.7%	-0.8%
Copper	34.6%	18.2%	0.2%	-5.1%	-6.8%	-7.7%	-8.3%	-8.9%
Steel Avg	-15.6%	10.2%	3.5%	0.6%	-3.2%	-2.0%	-2.3%	-2.4%

2. Introduction

Sinclair Knight Merz (SKM) was engaged by Queensland Electricity Transmission Corporation Limited (Powerlink Queensland) to establish material price escalation factors for the period 2009/10 to 2016/17.

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 is required to submit its Regulatory Proposal for the upcoming regulatory control period to the Australian Energy Regulator (AER) by 31 May 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 2012/13 to June 2016/17.

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

3. Objective & Scope

This section presents the objective and scope of this assignment.

3.1. Objective

The objective was to propose materials cost escalation factors needed to support the preparation of Powerlink Queensland's Regulatory Proposal. The process undertaken by SKM includes:

- identifying cost drivers affecting Powerlink Queensland's capital expenditure programs over the period June 2009/10 to June 2016/17;
- describing the properties of each forecast, e.g. when it was made, who it was made by, for what purpose it was made. Also select and explain the choice of point estimate for each forecast; and
- identifying the drivers behind each of the aforementioned forecasts.

3.2. Scope

The scope of the proposed study prescribed that the assignment, and associated final report, would:

- propose annual escalation factors for steel, aluminium and copper for the next regulatory control period, with relevance to their indirect and direct inputs into standard electricity assets;
- describe the forecasting methodology used by SKM including the key drivers likely to impact on material escalation over the next regulatory control period;
- forecast movements in contractor margin over the next regulatory period;
- disclose any external information, relied on by SKM in reaching its conclusions;
- describe SKM's relevant expertise in relation to the scope of works;
- review and consider recent AER decisions; and
- provide updated forecasts of material escalations factors as appropriate.

4. Project Outcomes

The primary deliverable for this assignment is a forecast of the drivers behind materials cost escalation and contractor margin that may be applied to Powerlink's Revenue Proposal for the 2012/13 to 2016/17 Regulatory Control period.

The report includes:

- An outline of the SKM methodology applied during each stage of the analysis; (Appendix A)
- A detailed account of all information and assumptions (e.g.: the basis of CPI figures) made by SKM during the development of its escalators, including the source of such information and assumptions; (throughout Appendix A and Chapter 5)
- The historical and forecast values (e.g.: real terms in financial year format); and
- SKM's recommendations (Chapter 6).

SKM also notes that this report was developed with regard to:

- The NER requirements and in particular clause 6.5.7 which sets out the capital expenditure objectives, factors and criteria when preparing the report.
- The National Electricity Objective that is set out in section 7 of the National Electricity Law (NEL);
- Recent AER's Decisions; and
- The Federal Court of Australia Expert Witness Guidelines.

5. Updating Movements in Key Cost Drivers

In order to remain current, forecast positions of the key cost drivers within the SKM model are updated on a quarterly basis to ensure the most recent information is used as the basis of each assignment requiring the model's application.

The following sections present the methods by which the forecast movements of each cost driver are updated.

SKM clarifies that each forecast is developed according to the methodology as approved during the AER's Final Decision for the Queensland Distribution Network Service Providers.

5.1. Contractor's Margin

In previous decisions, regulated parties have sought to account for expected adjustments to costs brought about by changes in the profit margin of contractors.

In 2007 the Essential Services Commission of Victoria requested the Allen Consulting Group (ACG) to review two reports prepared by NERA[2] and PricewaterhouseCoopers[3], which had been commissioned by Envestra[4], and presented in support of the costs incurred in opex activities within a gas distribution network under an outsourced services contract.

The resulting report[5] highlighted some of the difficulties in benchmarking contractors' margins.

ACG concluded that the use of earnings before interest and taxation as a proportion of revenue was the most appropriate measure of a contractor's margin. However, in comparing these measures of a contractor's margin, ACG concluded that other considerations, such as whether or not arms-length agreements were in place, whether the companies were engaged in undertaking the same principle activity, the overall size of the contractor (with smaller firms being excluded), and its relative level of capital intensity, all affected the relative degree of comparability.

These difficulties in gathering comparable information on contractor's margins, also only pertain to historic costs, as they would be taken from published financial reports.

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[2] http://www.esc.vic.gov.au/NR/rdonlyres/AC4D8455-9002-4AEF-BEC2-7104BF05E0FC/0/EnvestraAtt2NERA.pdf

[3] http://www.esc.vic.gov.au/NR/rdonlyres/EAA92BC2-9639-4B6F-AE0F-1D61DAF19AEF/0/EnvestraAlburyAtt3.pdf

[4] Envestra owns natural gas distribution networks in Victoria and other states, see: http://www.envestra.com.au

[5] http://www.esc.vic.gov.au/NR/rdonlyres/31436970-9E42-4126-8820-E58862E5066C/0/ACGBenchmarkingofContractorsMargins.pdf

Indeed, SKM found there was a lack of credible information regarding forecasts of the likely margins that contractors would be able to claim in the years corresponding to Powerlink's upcoming regulatory control period.

In the absence of any such forecast, SKM would consider a reasonable proxy of this underlying cost pressure, to be changes in construction costs, as it was considered realistic to propose that a contractor would pass on the cost of doing business to the end-user. The cost of doing business to such a contractor would in turn be dependent on the cost of materials and Labour.

5.2. Producers Margin

During the TransGrid determination[6], there was an attempt to account for the factor of cost within items of electricity network infrastructure associated with the profit margins available to the manufacturers of such items.

A report by TransGrid's consultant, CEG, entitled, Escalations affecting expenditure forecasts, A report for NSW and Tasmanian Electricity Businesses, January 2009,[7] stated that;

"It is also highly likely that producers' margins will increase in real terms over the period to 2014. An important factor in determining the cost of equipment is the balance between supply and demand in world equipment markets. This balance appears to have tipped significantly in the favour of producers in the last year and is forecast to continue to do so for the immediate term. This applies across the board for the suppliers of specialised electricity distribution and transmission equipment."

Through data submitted during a recent market pricing survey, SKM is also aware of incidental evidence suggesting that some electrical plant and equipment suppliers are in fact receiving higher profit margins. Survey participants felt this was due to the increase in demand for network plant and equipment that is being driven by growth in networks through population increases, growth in network demand through lifestyle changes (increases in uptake of Air Conditioners etc), and the need to replace aging assets. The suggestion being that the forces involved in the market price setting mechanisms, are currently working in favour of suppliers.

These underlying cost pressures within the electricity industry were also raised in a recent publication by Energy Supply Association of Australia CEO, Brad Page[8].

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[6] http://www.aer.gov.au/content/item.phtml?itemId=728112&nodeId=c39e1bf783ef48dea95e65871c945538&fn=TransGrid%20final%20decision.pdf

[7] http://www.aer.gov.au/content/item.phtml?itemId=726172&nodeId=a8f9747c6cf2ec50f52fc8a28678b6e0&fn=Appendix%20E%20-%20CEG%20Escalation%20Report.pdf

"*A big increase in population and rising energy demand is driving a need for new connections at a rate never before seen, and the cost of meeting this has been exacerbated by the need for upgrades to ageing network facilities*."

Whilst it is generally accepted throughout the industry that increases in the demand for plant and equipment is affecting manufacturers' pricing, it is unfortunately not possible, in this instance, to accurately estimate the quantum of such impact.

There are also no credible forecasts for future producer's margins for the periods comprising Powerlink's upcoming regulatory control period.

In the absence of better information regarding this driver of equipment cost, SKM has assumed manufacturing costs increase in line with CPI – i.e. no real price escalation.

SKM notes that this consideration is likely to add to the development of conservative estimates of cost escalation.

5.3. Commodity Prices

This section of the report presents the methodology employed by SKM in updating the commodity price inputs to its cost escalation model.

5.3.1. Commodities and the use of Futures contract pricing

The inclusion of forward contracts pricing, as a means to predict the market pricing positions of the various commodities going forward is considered suitable as these contracts represent the firm position of market participants who have actively placed money behind their predictions.

Although it may be argued that professional economists are putting valuable reputations on the line when providing their own market predictions, the forward contract markets are considered to provide greater and more immediate financial risk than the various economic forecasts that do not involve any direct financial risk to the forecasters. This view is consistent with the methodology accepted by the AER in its Final Decision for Ergon Energy and ENERGEX.

[8] http://www.esaa.com.au/content/detail/privatisation_not_to_blame_for_power_prices

SKM has thus adopted futures prices into its forecast method. This is discussed in further detail in section 5.3.3.

5.3.2. Credible views of a range of Professional forecasters

It has been established that the price of oil futures contracts that covered the majority of the revenue control period under investigation is available. However in the case of other inputs, such as copper and aluminium, the London Metals Exchange (LME) futures contracts only go out as far as 27 months.

In order to estimate prices beyond 27 months, it is necessary to revert to economic forecasts as the most robust source of future price expectations. SKM considers this to be superior to "trend" based analysis approaches as it brings into account known and expected market conditions (e.g. volume of supply changes through a new mine coming online) that are not accounted for within historical data.

SKM's methodology conforms to the approach accepted by the AER in recent final decisions in utilising Consensus Economics' quarterly publication "*Energy and Metals Consensus Forecasts*" as its source from which the long-term position of the copper and aluminium market prices are sourced.

Consensus Economics Inc.[9] is a leading international economic survey organization based in the United Kingdom. Its publication, "*Energy & Metals Consensus Forecasts*", is a subscription based comprehensive quarterly survey of over 30 of the world's most prominent commodity forecasters.

These quarterly reports provide details of the price forecasts, of each professional analyst surveyed, for the next 10 quarters. It also provides the "mean" or "consensus" of these various individual market predictions. In doing so, the publication allows the user to gather an overall market perception, without the need to apply a weighting to individual predictions in terms of gauging the organisation's perceived strength in forecasting, historical accuracy or such.

In developing year to June price movements for copper and aluminium, SKM uses a method of linear interpolation, between the relevant 27 month LME contract prices and the Consensus Economics long term predictions of price movements, as described in section 5.3.3.

9 http://www.consensuseconomics.com/index.htm

5.3.3. SKM's Application of Futures Contracts and Long-term Forecasts

When updating the position of the key cost drivers, SKM employs various combinations of futures contract prices and a range of views from credible forecasting professionals to develop likely year to December price positions of key cost components.

5.3.3.1. Aluminium and Copper

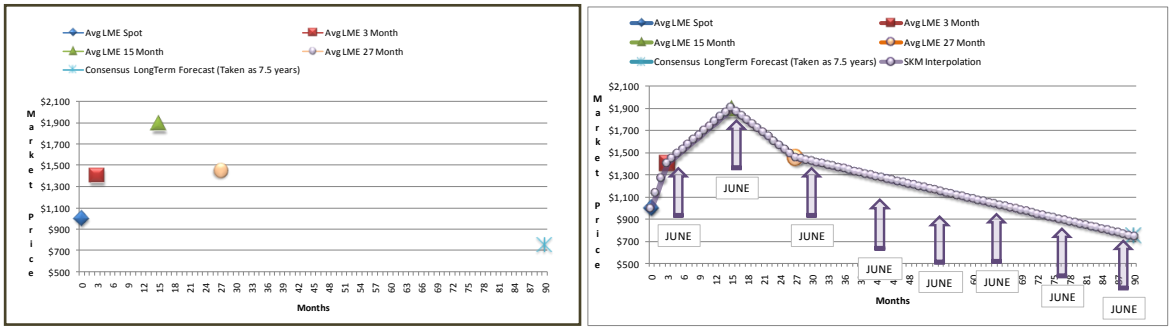
When updating the position of the key cost drivers of aluminium and copper within its model, SKM undertakes a seven step approach to produce specific data points between which linear interpolation is applied in order to arrive at the implied year to June future pricing positions.

Because of the volatility in daily spot and futures market prices, SKM uses monthly averages of prices within its modelling process. The steps involved are:

1. Plot the average of the last 30 days of LME Spot prices
2. Plot the average 3 month LME contract price
3. Plot the average 15 month LME contract price
4. Plot the average 27 month LME contract price
5. Plot the Consensus Long-Term Forecasts position (taken as 7.5 years from survey date[10])
6. Apply linear interpolation between plot points.
7. Identify the Corresponding year to June points in the interpolated results, and feed these prices into the model.

This methodology is illustrated in Figure 1 (*Note that all figures are illustrative only and do not refer to the actual position/price of any particular commodity*).

Figure 1 Diagram of methodology - Steps 1-5 (left) and Steps 6-7 (right)



[10] The Consensus Long-term forecast is listed in the publication as a 5 – 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.

5.3.3.2. Interpolation of real long-term forecast pricing positions

In previous regulatory submissions, there was a requirement to convert the "real" long-term Consensus Economics pricing positions to their "nominal" form, in order to allow for interpolation between "nominal" LME market prices and the long-term Consensus Economics pricing position for any commodity.

However, as of the October 2010 consensus forecast, the long-term pricing forecast was stated in its nominal form.

5.3.4. Price movements for commodities

With average annual commodity prices having fallen so dramatically during 2009 and then displaying significant volatility through early 2010, the markets are now being forecast to continue some price recovery in the short term, before levelling out, reflecting more consistent annual supply and demand conditions.

This move toward increased consistency in supply and demand patterns is widely thought to emerge somewhere around the year to June 2013 period.

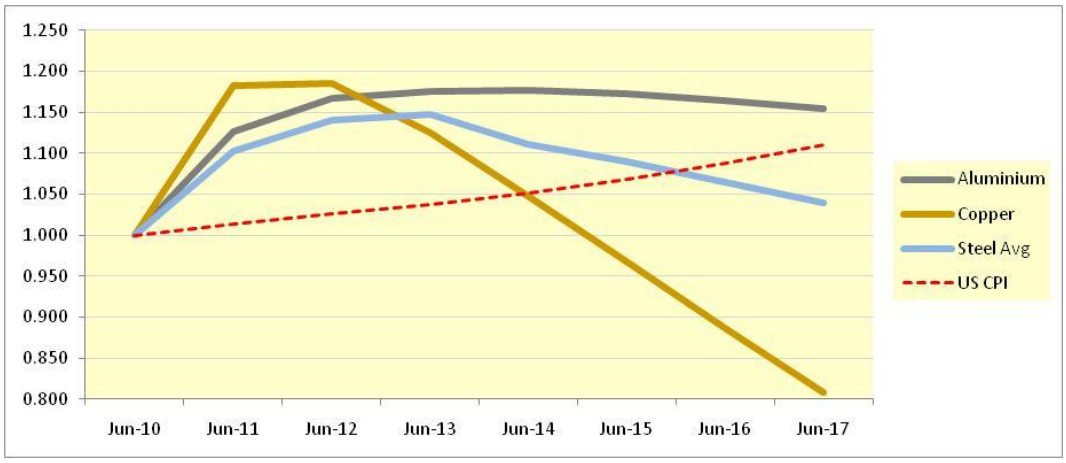
Figure 2 shows the predicted movements in the US$ based market prices of the various commodities that influence the price of network plant and equipment.

Figure 2 Forecast Average Annual Commodity Price Movements (REAL- US$)

Source: SKM modelling of commodity data

Figure 3 presents the affect of the cumulative average real annual movements of these commodities (against CPI) indexed to their average year to June 2009 position.

- **Figure 3 Real AUD based Commodity prices indexed to June 2010.**



Source: SKM modelling of commodity data

The average year to June numbers developed through SKM's modelling of the Aluminium and Copper market prices are presented in Table 2 and Table 3.

- **Table 2 Real US$ based price of Aluminium**

	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Aluminium	$2,018	$2,272	$2,354	$2,373	$2,374	$2,365	$2,349	$2,330
Annual Change	7%	13%	4%	1%	0%	0%	-1%	-1%

- **Table 3 Real US$ based price of Copper**

	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Copper	$6,691	$7,909	$7,926	$7,524	$7,010	$6,473	$5,934	$5,407
Annual Change	35%	18%	0%	-5%	-7%	-8%	-8%	-9%

5.3.5. Steel

Steel manufacturing is an energy intensive process of production, with energy representing approximately 20% of the final cost of production[11]. In addition, coal is used as an input to the steel making process, with an indicative figure of 741kg of coal per ton of Steel.[12]

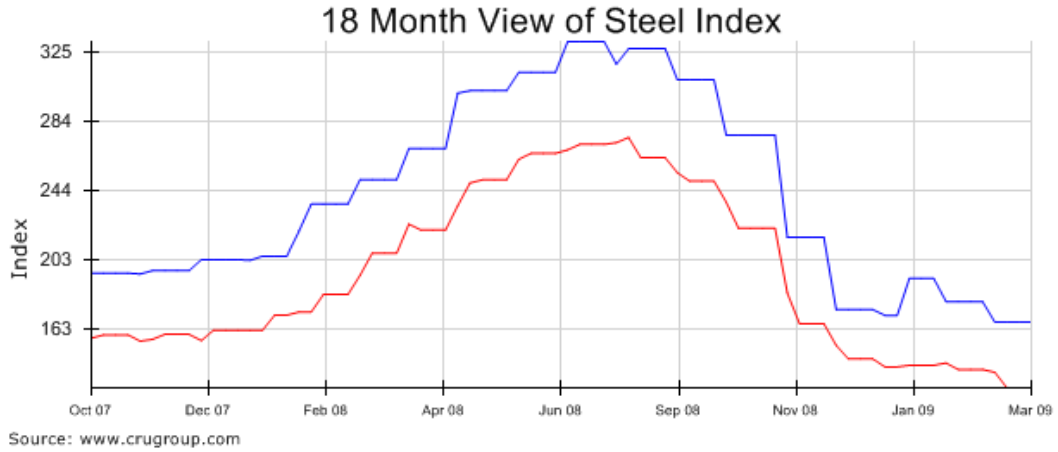
[11] American Iron and Steel institute, "*Saving one barrel of oil per ton*" October 2005.

[12] Chinese Iron and Steel Industry Association data, 2005.

SKM's research found that in 2008 both European and Asian steel mills had agreed to over 300% increases in premium hard coking coal contract prices. Japanese and Korean Steel mills were also reported to have accepted a 65% rise in the price of iron ore within their contracts.

These factors contributed to the CRU[13] index of Steel prices (CRUspi) having increased by 66% over the year to June 2008, as illustrated in Figure 4.However through the drop off in demand from China, and the overall lower level of development as a result of the Global Financial Crisis, market prices fell dramatically between June 2008 and January 2009.

- **Figure 4 Recent 18 month Movements in the CRUspi[14]**



Key: Flat Steel index (Red); Longs Steel Index (Blue).

An application of the methodology used for oil, copper and aluminium was not possible due to the lack of a liquid Steel futures market. SKM note that the LME commenced trading in steel futures in February 2008.[15] However, the LME has communicated that this new steel futures market is undergoing a purposely planned "soft launch", and its liquidity is still being built up.

SKM considers the LME steel futures are still not yet sufficiently liquid to provide a robust price outlook, but expects it will incorporate these prices in future developments of its price forecast.

SKM has selected the Consensus Economics forecast to be the best currently available outlook for steel prices. Consensus provides quarterly forecast prices in the short term, and a "long term" (5-10 year) price. This is consistent with the methodology accepted by the AER in its Final Decision for Ergon and ENERGEX.

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13 CRU was founded in 1969 and was previously known as Commodities Research Unit. CRU is widely acknowledge as an authoritative source of information and data in areas such metals and mining.

14 CRU Steel Price Index. Available at: http://cruonline.crugroup.com

15 http://www.lme.co.uk/5723.asp

Steel prices for all historical periods are taken from an average of the Bloomberg US and EU steel prices.

The most recent Consensus Survey available at the time of compiling this report was their July 2010 Survey. This publication provided quarterly forecast market prices for steel from September 2010 to December 2012, as well as a Long-term forecast pricing position.

Consensus Economics provides two separate forecasts for steel, both being for Hot Rolled Coil (HRC) variety, with the first being relative to the USA domestic market and the other the European domestic market.

The Consensus Economics US HRC price forecasts are presented USD per *Short Ton*. As historical prices are all quoted in USD per *Metric Tonne*, it is necessary to convert these prices into their Metric Tonne equivalent. This is a simple operation with the US HRC prices multiplied by a factor of 1.1023, being the standard conversion rate for the number of short tons per Metric Tonne.

An example of this process is shown in Table 4.

Table 4 Conversion of Short tons to Metric tonnes (USD nominal)

	Sep-10	Dec-10	Mar-11	Jun-11	Sep-11	Dec-11	Mar-12	Jun-12	Sep-12	Dec-12
HRC US in tons	676	649	666	684	691	688	689	707	717	704
Equivalent HRC US in tonnes	745	716	734	754	762	759	760	779	791	776

Once converted to their Metric Tonne pricing position, SKM uses the average of these two forecasts (US HRC and EU HRC) as its Steel price inputs to the cost escalation modelling process.

The figures used as inputs to SKM's modelling are presented in Table 5. SKM's methodology of integrating Consensus Steel price forecasts into the development of cost escalation factors adheres to the methodology for cost escalation as accepted by the AER in the VIC DNSP Final Decisions[16].

Table 5 Real US$ Pricing position of average HRC steel prices

	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Steel Avg	$612	$675	$699	$703	$ 681	$667	$652	$636
Annual Change	-16%	10%	4%	1%	-3%	-2%	-2%	-2%

[16] http://www.aer.gov.au/content/index.phtml/itemId/740791

6. Conclusion & Recommendations

The SKM cost escalation modelling methodology provides a rigorous and transparent process through which reasonable and appropriate cost escalation rates are able to be developed in relation to the prices of network plant and equipment.

The proposed escalation factors were developed with specific consideration to the operating environment faced by Powerlink Queensland, and based on the most up-to-date information available at the time of compilation.

These escalation rates therefore represent SKM's forecast of underlying cost pressures that Powerlink will be exposed to over the year to June periods 2012/13 to 2016/17 inclusive.

The results of SKM's modelling during this assignment are presented in Table 6 below.

Table 6 Average annual real US$ based change in underlying network materials cost drivers

Component	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Aluminium	7.2%	12.6%	3.6%	0.8%	0.0%	-0.4%	-0.7%	-0.8%
Copper	34.6%	18.2%	0.2%	-5.1%	-6.8%	-7.7%	-8.3%	-8.9%
Steel Avg	-15.6%	10.2%	3.5%	0.6%	-3.2%	-2.0%	-2.3%	-2.4%

SKM has concluded that these escalation rates form a component of the "*capital expenditure that would be incurred by an efficient TNSP over the regulatory control period*"[17]

SKM therefore recommends that Powerlink Queensland adopt these proposed escalation rates within their forward capital and operating expenditure programs.

[17] NER, transitional chapter 6 rules, clause 6.5.7 (e) (4).

Appendix A Methodology

This appendix to the report provides a discussion of the method employed by SKM in developing its forecasts for cost escalation factors.

A.1 Need for a Materials Cost Escalation Model

SKM has considers that movements in the CPI does not accurately reflect the relative movements in costs associated with electricity network projects, and has sought to establish an enhanced understanding of specific escalation rates that capture the movements in a network service providers' costs for the various items of plant and equipment within a typical program of capex and opex works.

This view was echoed through The World Bank's June 2008 report entitled; "*Study of Equipment Prices in the Energy Sector"* which stated that;

> *"In the past four years, global demand has led to substantial increases in equipment and material prices in the power sector. This is mainly due to significant increases in the escalation of raw material materials and labor associated with the manufacture and fabrication of equipment"*
>
> *"From 2006 to 2008 alone, energy projects financed by the World Bank experienced 30%-50% increases above the original cost estimates, requiring additional financing, a reduction in scope of the project, or schedule delays."*

The opportunity to develop an enhanced understanding of the drivers of network asset costs originally presented itself to SKM during a 2006 multi-utility strategic procurement assignment. It was from this study that SKM was able to demonstrate that prices were increasing faster than CPI, and was able to develop and calibrate a model that described this escalation.

The 2006 SKM multi-utility strategic procurement assignment was repeated in 2009/10.

A.2 Refining and enhancing the Model

SKM's database of capital costs and the cost escalation model itself have been progressively refined and updated since their first introduction, by:

- obtaining updated budget price information from suppliers and contractors for individual plant, equipment and projects;
- conducting market price surveys and plant / equipment procurement studies whereby utilities share their pricing information on a confidential basis with SKM;
- other external project costs for non-utility clients that are project managed by SKM;

- input through reviews of the SKM model by external parties;
- input through consideration of alternative methodologies within external models; and
- input through consideration of alternative methodologies suggested within SKM's internal peer and practice reviews.

Further, SKM has incorporated improvements to its modelling method driven by emerging information, particularly in response to regulatory precedents and improved cost information as it becomes available.

Appendix B SKM Recent Experience

On request from Powerlink, SKM has included a summary of its recent experience in cost escalation development and modelling.

SKM has assisted several electricity utilities, both at the transmission and distribution level, in analysing the impact of movements in commodity prices and labour on the costs of network assets, as well as in providing independent validation of their capex and opex modelling processes.

These projects have included:

Joint VIC DNSPs (JEN, UED, SP AusNet, CP & PC) - 2010

SKM provided updates of cost escalation rates modelled for the Victorian Distribution companies. These updated rates were included in revised submissions to the AER.

Country Energy Gas Networks – 2010

SKM was engaged to provide a Due Diligence of the Country Energy regional gas network in Wagga Wagga (NSW). A section of this study involved reviewing the modelling undertaken to develop cost escalation rates for plant and equipment within the Gas industry.

Ergon Energy – 2010

SKM was engaged to provide an update of cost escalation rates developed the previous year. The effect of rapid movements in a number of underlying cost drivers was required to be modelled in order to provide a more recent set of outputs.

ENERGEX – 2010

SKM was engaged to provide a set of suitable cost escalation rates for ENERGEX's capex and opex programs of work. ENERGEX had received an unsatisfactory response from the AER in relation to the cost escalation rate modelling proposed by its consultants during its initial regulatory submission, and engaged SKM to provide modelling for its revised submission. The SKM rates were received favourably by the AER.

CitiPower / PowerCor - 2009

In a separate engagement, SKM developed materials cost escalation rates for the CP / PAL opex programs.

Joint VIC DNSPs (JEN, UED, SP AusNet, CP & PC) - 2009

SKM was engaged by the Joint Victorian Distribution Network Service Providers to provide capex escalation rates for their regulatory submissions. The outputs were tailored to individual asset categories nominated by each of the participants.

ETSA Utilities – 2009(a)

SKM was engaged to provide an independent review of the cost escalation rates within the South Australian DNSP's Opex models. This project has been initiated as part of ETSA Utilities' preparation for the submission of its revenue proposal to the AER.

TRANSCO (Philippines) – 2009

SKM was engaged to apply its cost escalation modelling experience to escalate TransCo's internal asset unit rates to current pricing levels

ETSA Utilities – 2009(b)

In a separate assignment, SKM was engaged to provide inputs to the development of materials cost escalation rates within the South Australian DNSP's capex model, as part of ETSA Utilities' preparation for the submission of its revenue proposal to the AER.

Transend Networks – 2009

SKM was engaged to investigate the long-term average transmission network materials and labour cost escalation rates in Tasmania.

ElectraNet – 2009

SKM was engaged to apply its cost escalation modelling experience to escalate ElectraNet's internal opex model unit rates to current pricing levels.

Ergon Energy – 2009

SKM was engaged to provide an update of cost escalation rates developed the previous year. The effect of rapid movements in a number of underlying cost drivers was required to be modelled in order to provide a more recent set of outputs. The resulting cost escalation rates are to be included as part of Ergon Energy's official revenue proposal to the AER.

Ergon Energy – 2008

SKM was engaged to map key cost drivers within its model, to internal opex cost estimation unit rates within Ergon Energy models.

Ergon Energy – 2008

SKM undertook Stage 2 of the Ergon assignment relating to Electricity Industry Labour, Commodity and Asset Price & Cost Indices. During this period the SKM cost escalation model underwent extensive enhancements.

Transend – 2008

SKM were engaged to provide cost escalators factors in order to promote Transend's most recent asset valuation , having been based in June 2006 AUD$ terms, to June 2008 amounts as part of the TNSP's regulatory proposal. The established SKM Capex Cost Escalation Model was utilised for this project.

TransGrid – 2008

During this assignment, SKM reviewed TransGrid's Capex model, corrected errors in their methodology, and provided an independent validation for use during TransGrid's revenue proposal to the AER.

ActewAGL - 2008

SKM to provided an independent assessment of the escalation factors that apply to Actew AGL's capital works programmes and projects going forward over the period 2007/8 (the base year) to 2013/14 (the final year of the next regulatory period). This was included in Actew AGL's submission to the AER.

Ergon – 2008

SKM undertook Stage 1 of the Ergon assignment relating to Electricity Industry Labour, Commodity and Asset Price & Cost Indices.

AER – 2007/2008

In July 2007, SKM was engaged by the Australian Energy Regulator (AER) to review the regulatory revenue proposal submitted by ElectraNet for their next regulatory reset period 2008 to 2013. During this assignment the SKM model was both updated and enhanced through consideration of elements presented by ElectraNet. The AER accepted the SKM view to cost escalation index design.

SP AusNet - 2007

SKM was engaged by SP AusNet to analyse the likely drivers of cost escalation on capital expenditure forecasts over the remaining two years of their current determination (2006/07 and 2007/08), and for the next regulatory reset period (2008/09 to 2012/13, commencing 1 April 2008).

The SKM SP AusNet assignment set the precedent for above CPI escalation of capex costs. The AER accepted the SKM methodology noting that it produced robust figures for the purpose intended.

ENERGEX - 2007

SKM was engaged by ENERGEX to provide forward estimates of budget figures relating to the ENERGEX Program of Works.

ENERGEX - 2005

SKM conducted a multi-utility study of equipment procurement strategies and prices, which examined current market and contract costs for a variety of assets including power transformers, circuit breakers, current and voltage transformers and conductor.

Appendix C SKM Team members CV's

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

Jeff Butler – Project Director

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.

As project Director, Jeff was tasked with ensuring Powerlink received the project deliverables as per the scope of the assignment. Jeff also undertook reviews of the draft and final reports.

Alex Lambe – Project Manager & Cost Modelling

Alex holds an MBA and a Bachelor of Commerce degree. His roles as a Business Analyst within the Strategic Consulting group of the Queensland Power and Industry Operations Centre, involve assisting in network cost escalation development & modelling, assisting NSP asset valuation processes (both within Australia and Internationally), reviewing Capex & Opex estimation and costing models, capex project portfolio risk assessment, project ranking and Cost Benefit Analysis, economic impact analysis, project feasibility studies, and undertaking intensive economic and energy market research.

Relevant experience includes several assignments assisting TNSPs and DNSPs with regulatory reset proposals, as well as being part of the SKM team that undertook a review of the ElectraNet revenue reset submission on behalf of the AER. Alex holds significant cost escalation modelling experience of particular relevance to this assignment, and is the current custodian of the SKM model.

Alex 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. He was also previously employed by EnergyAustralia, the electricity supplier to the Sydney Olympic Games in 2000.

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.