Appendix H:

SPI PowerNet Pty Ltd

Transmission Revenue Reset (TRR) 2014/15 – 2016/17

Annual Real Material Cost Escalation Forecast 2014/15 – 16/17 - Sinclair Knight Mercer (SKM)

11 October 2013

SP AusNet

ANNUAL REAL MATERIAL COST ESCALATION FORECAST 2014/15 – 2016/17

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SKM

SP AusNet

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Contents

Limitations Statement

Forecasts are by nature uncertain. SKM has prepared these projections as an indication of what it considers the most likely outcome in a range of possible scenarios. These forecasts represent the author's opinion on what is considered to be reasonable forecasts, as at the time of production of this document and based on the information set out in this report.

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 behaviour of multiple suppliers and end users, all subject to uncertianty and beyond the control of SKM, and hence SKM cannot warrant the projections contained in this report.

Expert Witness Compliance Statement

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

In providing consultive service in other assignments, SKM acknowledges a pre-existing relationship with SP AusNet, 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 Energy Industry.

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

Executive Summary

In previous decisions for electricity network service providers, the Australian Energy Regulator (AER) has allowed for costs related to capital and operational expenditure provisions to be escalated in real terms. Prior to these decisions the Australian Consumer Price Index (CPI) was used by the AER to represent cost escalation in relation to network material costs. The method currently accepted by the AER involves the modelling of the change in equipment prices through combining independent forecast movements in the real price of input commodities, with weightings for relative contribution of each commodity to the final equipment cost. This in turn generates real cost forecasts for the regulatory control period under review.

Sinclair Knight Merz (SKM) was engaged by SP AusNet Ltd (SPA) in 2012 to forecast the real annual material cost escalation indices over the period April 2014 to March 2017 for SPA's forthcoming electricity Transmission Revenue Reset (TRR). SKM's forecast produced in November 2012 was included in SPA's TRR proposal to the AER on 28 February 2013. The AER provided its draft decision on this proposal on 30 August 2013. SPA is now required to submit its revised proposal to the AER by 11 October 2013.

In preparation of the revised proposal, SKM (in this report) has now updated the cost escalations and provided feedback and analysis on the draft decisions of the AER. In particular, this report contains:

- **An update of the real annual material cost escalation forecast.** This will form an input in the development of SPA's revised proposal to the AER for the 2014/15 to 2016/17 regulatory control period. The update is presented in detail in Section 2, Section 3, and Section 4 of this report;
- **Response to the discussion of labour costs in the draft decision.** SKM provides clarification on the draft decision's supposition that labour costs are included SKM's earlier materials forecast included in SPA's initial proposal. SKM believe that the AER has erroneously formed its opinion with regard to SKM's material cost escalation indices for SPA's standard asset classes being inclusive of utility industry labour cost component. This response is presented in Section 5 of this report; and
- **Comparative analysis of the AER provided inputs** (the underlying cost drivers and economic indicators). SKM has reviewed inputs that were used in the draft decision against different sets of forecast produced at different times. This analysis along with comments on observed anomalies is presented in Section 6 of this report.

In developing the material cost escalation indices forecast, SKM has applied methodology consistent with the accepted approach for the AER's most recent decisions. The real annual escalation indices presented in this report are specific to the operating environment faced by SPA, and are based on the most recent information available.

The following two tables present the forecast results of SKM's analysis and modelling of underlying cost drivers and economic indicators, and material cost aggregated to SPA's standard asset classes respectively. The forecasted annual time period reference in all the tables in this report runs from 1 April to 31 March in the following year. The base annual period for the real dollar term is April 2012–March 2013 year.

Table 1 presents the percentage change in the real annual cost escalation against the underlying cost drivers of electricity network infrastructure and economic indicators. The table provides result for two scenarios – namely, with and without the continuation of the existing carbon price mechanism. The extent of impact of the carbon price mechanism for locally produced materials is also provided in the table, assuming that half the cost increase experienced by manufacturers in Australia can be passed through to the customers. It is anticipated that there will be no carbon price impact on imported materials and products.

- Table 1 Real annual cost escalation % change forecast of underlying network material cost drivers and economic indicators

Cost Drivers & Economic Indicators	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Scenario: With the continuation of carbon price mechanism					
Australian CPI	0.00%	0.00%	0.00%	0.00%	0.00%
Australian TWI	0.44%	-11.30%	0.00%	0.00%	0.00%
Aluminium	-15.13%	3.07%	7.92%	5.28%	4.74%
Copper	-8.02%	0.13%	3.33%	0.76%	0.55%
Steel	-12.42%	5.80%	6.97%	1.48%	3.23%
Oil	-5.98%	16.65%	0.70%	-1.49%	1.62%
Construction costs	9.27%	4.87%	2.96%	2.93%	2.93%
Scenario: Without the continuation of carbon price mechanism from July 2014					
Australian CPI	0.00%	0.00%	0.00%	0.00%	0.00%
Australian TWI	0.44%	-11.30%	0.00%	0.00%	0.00%
Aluminium	-15.13%	3.07%	7.77%	5.07%	4.51%
Copper	-8.02%	0.13%	3.32%	0.76%	0.54%
Steel	-12.42%	5.80%	6.91%	1.39%	3.13%
Oil	-5.98%	16.65%	0.70%	-1.49%	1.62%
Construction costs	9.27%	4.87%	2.96%	2.93%	2.93%

The above figures exclude the impact for the SF_6 (sulphur hexafluoride) import levy in the consideration for the carbon price mechanism.

Table 2 presents real annual material cost escalation indices forecast based on the movements in underlying cost drivers and economic indicators, but aggregated at common standard asset class level used by SPA. The inclusion of the Australian carbon emissions costs gives due consideration to SPA's asset supplier profile, market competition and international pricing pressure.

- Table 2 Real annual material cost escalation indices forecast aggregated to SPA's common standard asset classes

Asset Classes	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Scenario: With the continuation of carbon price mechanism and considering SPA's asset supplier profile and market dynamics					
Secondary	1.000	0.951	1.004	0.999	1.003
Switchgear	1.000	0.965	1.017	1.004	1.009
Transformers	1.000	1.029	1.030	1.008	1.014
Reactive	1.000	1.029	1.030	1.008	1.014
Overhead Lines	1.000	1.036	1.043	1.022	1.027
Underground Cables	1.000	1.023	1.019	1.007	1.010
Establishment	1.000	1.049	1.030	1.029	1.029
Communications	1.000	1.000	1.000	1.000	1.000

Asset Classes	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Non System – Others[2]	1.000	1.028	1.019	1.000	1.012
Vehicles	1.000	1.000	1.000	1.000	1.000
Premises	1.000	1.000	1.000	1.000	1.000
Network Switching Centre	1.000	1.000	1.000	1.000	1.000
IT	1.000	1.000	1.000	1.000	1.000
Scenario: Without the continuation of carbon price mechanism from July 2014 and considering SPA's asset supplier profile and market dynamics					
Secondary	1.000	0.951	1.004	0.999	1.003
Switchgear	1.000	0.965	1.017	1.004	1.009
Transformers	1.000	1.029	1.030	1.008	1.014
Reactive	1.000	1.029	1.030	1.008	1.014
Overhead Lines	1.000	1.036	1.043	1.021	1.026
Underground Cables	1.000	1.023	1.019	1.007	1.010
Establishment	1.000	1.049	1.030	1.029	1.029
Communications	1.000	1.000	1.000	1.000	1.000
Non System – Others[3]	1.000	1.028	1.019	1.000	1.012
Vehicles	1.000	1.000	1.000	1.000	1.000
Premises	1.000	1.000	1.000	1.000	1.000
Network Switching Centre	1.000	1.000	1.000	1.000	1.000
IT	1.000	1.000	1.000	1.000	1.000

The impact and therefore the inclusion of the Australian carbon price on the listed asset classes is dependent on the asset component make-up profile, SPA's asset supplier portfolio, market competition and international pricing pressure. It is noted that not all SPA's asset classes are impacted by the continuation of Australian carbon price mechanism. SKM have assumed in Table 2 that only asset classes which are locally manufactured will experience and be able to pass through some portion of the local carbon price impact, as the Australian carbon price is expected to have a negligible impact on imported assets.

[2] SKM notes the use of the term "Non System – Others" asset class by SPA and clarifies that it actually represents assortment of small items or miscellaneous materials that includes elements of various commodities, are used in the electricity network assets, and have some real price movement against CPI trend.

[3] Same as above.

1. Introduction

SKM was engaged by SPA in 2012 to forecast the annual real material cost escalation indices over the period April 2014 to March 2017 for SPA's forthcoming electricity TRR. The terms of engagement required SKM to provide its service to SPA in two stages, including:

(1) Generation of escalation forecast in November 2012, for inclusion in the SPA's TRR proposal, which was submitted to the AER on 28 February 2013.

(2) Review of draft AER findings (30 August 2013) and update of the escalation forecasts required for the submission of the revised proposal to the AER by 11 October 2013.

This report has been prepared in response to the second stage of SKM's engagement, with SPA currently preparing to submit its revised proposal to the AER. An integral step to developing annual expenditure forecasts is the production of a set of reasonable assumptions with respect to the likely rate of annual material cost escalation. SKM has been actively researching the capital costs of electricity network infrastructure works for some time. It has developed a material cost escalation modelling process which captures the likely impact of expected movements of specific input cost drivers on future electricity networks infrastructure equipment pricing, providing robust material cost escalation rates.

The annual real material escalation indices presented in this report represent SKM's calculated best estimate of likely cost escalation components to account for the predicted movement in underlying drivers affecting the cost of undertaking capital and operating expenditure work relative to the Australian CPI, being the base inflation factor used by the AER. Statements in this report that are not based on historical fact are forward looking statements. Although such statements are based on SKM's current estimates and expectations, and currently available competitive market economic data, forward looking statements are inherently uncertain. SKM, therefore, caution the reader that there are a variety of factors that could cause business conditions and results to differ materially from what is contained in forward looking statements in this report.

The annual real material escalation indices presented are specific to the operating environment faced by SPA, and are based on the most up-to-date information available at the time of compilation.

1.1 Objective and Scope of Work

SKM understands the objective of this assignment (i.e. second stage of the engagement) is to:

- Update the annual real material cost escalation forecast generated in the first stage with the latest set of available input information including methodology or timing changes to assess the carbon pricing impact;
- Provide appropriate response to any relevant issue raised in the AER draft decision on materials escalation; and
- Analyse the AER provided inputs (cost driver price indices forecast) used in its draft decision and compare it with other sets of forecast inputs.

The delivery of this objective will assist SPA in the preparation of their revised proposal. This delivery will be provided through the production of an independent consultant's report (this report), which can be submitted to the AER and published in the public domain.

SKM understand that SPA has undertaken a separate assignment by engaging BIS Shrapnel Pty Ltd to determine the annual real escalation indices forecast for utility labour cost (covering various classification of in-house or contract labour to build, operate and maintain the power network), and construction labour cost (covering various classification of in-house or contract labour preliminary for site related work). As such SKM's annual real escalation indices forecast is for the equipment or material component of the asset only.

1.2 Deliverables

The primary deliverable for this assignment is a clear and concise independent consultancy report which supports the resulting escalation factors including an explanation of the approach adopted in developing the annual real material cost escalation indices and how this approach is consistent with recent electricity network decisions.

2. Methodology

In past decisions for electricity network service providers, the AER has allowed the costs related to capital and operational expenditure provisions to be escalated in real terms. Prior to these decisions, the Australian CPI was generally used as a proxy to account for the escalation expected in relation to these network costs.

The methods more recently accepted by the AER sought to better characterise the likely escalation in price of equipment/project costs through combining independent forecast movements in the price of input components, with 'weightings' for the relative contribution of each of the components to final equipment/project costs. This in turn generates real cost forecasts for the regulatory control period under review.

In its 2009 final decision on prices for the NSW Electricity Distribution Businesses, the AER stated:

> *In light of these external factors, it was considered that cost escalation at CPI no longer reasonably reflected a realistic expectation of the movement in some of the equipment and labour costs faced by electricity network service providers (NSPs). It was also communicated by the AER at the time of allowing real cost escalations that the regime should systematically allow for real cost decreases. This was to allow end users to receive the benefit of real cost reductions as well as facing the cost of real increases.*[4]

SKM confirms that its method for modelling the forecast changes in the costs of materials used in SPA's capital and operating expenditure forecasts is consistent with the approach recently accepted by the AER.

This section of the report provides a step-by-step description of the method employed by SKM in modelling real material cost escalation forecast.

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 with rate higher than Australian CPI, and was able to develop and calibrate a model that described this escalation.

As part of this strategic procurement study a number of network asset equipment manufacturers and/or suppliers were surveyed to provide a greater understanding of the cost drivers underlying equipment pricing.

SKM also drew on information within studies undertaken on contract cost information for a number of turnkey and contracted construction projects (including plant equipment, materials, construction, testing, and commissioning). SKM's knowledge base of network management, operation, and asset procurement experience was also drawn upon during this establishment of cost drivers.

The results of SKM's research indicated that there are a number of common factors driving the changes in networks' capital infrastructure costs.

The primary factors (in no particular order) influencing material cost movements are considered to be changes in the market pricing position for:

- Metals – copper, aluminium and steel;
- Oil – as a material in itself, as a proxy for energy costs, and as a proxy for plastics (primarily High Density Polyethylene HDPE, Cross Linked Polyethylene XLPE);
- Construction costs;
- Foreign exchange rates – primarily the USD to AUD relationship to convert commodities in international market quoted in USD;

[4] AER 2009, NSW DNSP Final Decision P478. http://www.aer.gov.au/content/index.phtml/itemId/728076

- Foreign price inflation index – primarily the US Consumer Price Index (CPI) to convert price quoted in nominal USD terms into real USD term (and vice versa);
- Australian Trade Weighted Index (TWI) – as weighted average purchasing power of Australian dollar in overseas market and as a proxy for imported manufactured goods; and
- Australian Consumer Price Index (CPI) – as a general price inflation index in itself to convert nominal AUD quotes into real AUD term (and vice versa) and as a proxy for local manufacturing costs.

Having identified these key cost drivers, SKM examined each of the main items of plant equipment and materials within its database, in order to establish a suitable percentage contribution, or weighting, by which each of these underlying cost drivers were considered to influence the total price of each completed item.

In its determination and application of final cost driver weightings for these network assets, SKM drew on a wide range of information such as its knowledge of commercial rise and fall clauses contained within confidential network procurement contracts sighted by SKM during market price surveys, information passed on during its interviews with equipment suppliers and manufacturers; as well as industry knowledge held within its large internal pool of professional estimators, EPCM project managers, economists, engineers and operational personnel.

With appropriate weightings developed and assigned to each component, the key cost drivers thus provided a means by which changes in the forecast price of each underlying cost driver might be foreseen to affect the overall cost of the network asset itself.

While there are benefits in maintaining consistency, particularly with past precedents, SKM has incorporated improvements to its modelling method when there was a clear need, particularly in response to regulatory precedents and as improved cost information becomes available. The information and modelling method was further updated during the 2010 multi-utility strategic procurement assignment.

The cost drivers with relevant economic indicators used in the SKM's Model, their major application, and their reference sources is shown in Table 3.

- Table 3 Underlying information

Cost Drivers, Economic Indicators	Application (mostly used for)	Sources
Aluminium, Steel, Copper and Oil prices	Primary equipment, structures, overhead conductors, cables etc.	London Metal Exchange, Consensus Economics, MEPS, Bloomberg, US-Energy Information Administration and NYMEX.
Foreign exchange rates and Australian TWI	Imported goods in Australian currency (e.g. secondary, switchgear, insulators etc.) and for non-metallic and non-oil based items.	Bloomberg future contracts and Reserve Bank of Australia
Construction index	Civil, foundation, building, establishment etc.	Australian Construction Industry Forum.
Australian CPI	All (to convert nominal to real terms) and manufacturing.	Australian Bureau of Statistics and Reserve Bank of Australia.
US CPI	All imports (to convert nominal to real terms quoted in USD).	US Bureau of Labor Statistics and US Congressional Budget Office

Also, this update follows the same methodology with same proportional make-up profile of asset classes as followed in the production of SKM's earlier modelling forecast for SPA in November 2012 and included in SPA's initial proposal to the AER.

3. Movements in Key Cost Drivers

In order to ensure all forecasts incorporate current and recent market information, SKM updates key cost drivers and economic indicators within our internal model for each assignment. This ensures the most practical recent/current date information is used.

The following sections present a discussion of the methods by which the forecast movements of each cost driver and economic indicators are updated.

3.1 Australian Consumer Price Index

The Australian CPI is used as a proxy for the local manufacturing price index. SKM acknowledges that while the historic Australian Producer Price Index (PPI) for electrical equipment manufacturing is available[5], the forecast for such precise activity is not. More importantly, such Australian PPI provides composite price movement indication of the entire input (or output) mix of the manufacturing process, and as such is not an exact indicator of manufacturing activity (or manufacturing labour) only price movement. SKM has therefore relied on the Australian CPI, for which credible forecast is readily available, to represent the forecast trend of the manufacturing activity (manufacturing labour) price index.

The Australian CPI is also used to account for those materials or cost items in equipment whose price trend cannot be rationally or conclusively explained by the movement of commodities price.

Finally, the Australian CPI is used to convert the Australian based input data from nominal to real term and vice versa.

SKM has chosen to adopt the method of forecasting Australian CPI used by the AER in recent electricity network decisions. This method uses the following process:

- Plot the most recent actual/ historical quarterly Australian CPI data from the Australian Bureau of Statistic (ABS) record (June 2013 quarter data for this modelling exercise) and determine the annual Australian CPI % change by comparing it past historical data;
- Plot two and half years of annual Australian CPI % change forecasts from the most recent Reserve Bank of Australia (RBA) Statement on Monetary Policy (the August 2013), with forecasts out to December 2015;
- Plot the annual Australian CPI % change as the RBA's inflation target midpoint of 2.5% in long term;
- Apply linear interpolation between the above plotted annual % change points to form a continuous monthly data points for the entire duration of the forecast period; and
- Since this index data is annual measurements and take into account the movements over the previous 12 months, the data point from the last month (i.e. the 12th month data) of the annual period is considered to represent the index level for that year. Also, these data are fairly steady and constant, and generally moves in one predictable direction. Therefore, 'picking' the end 12th month data form an annual period and comparing it with the previous annual period's end 12th month data yields almost the same result as the comparison between the 12 month average from one annual period to 12 month average from the previous annual period.

This annual Australian CPI % change forecast used during SKM modelling is presented in Table 4.

[5] Australian Bureau of Statistics, PPI Table 12.

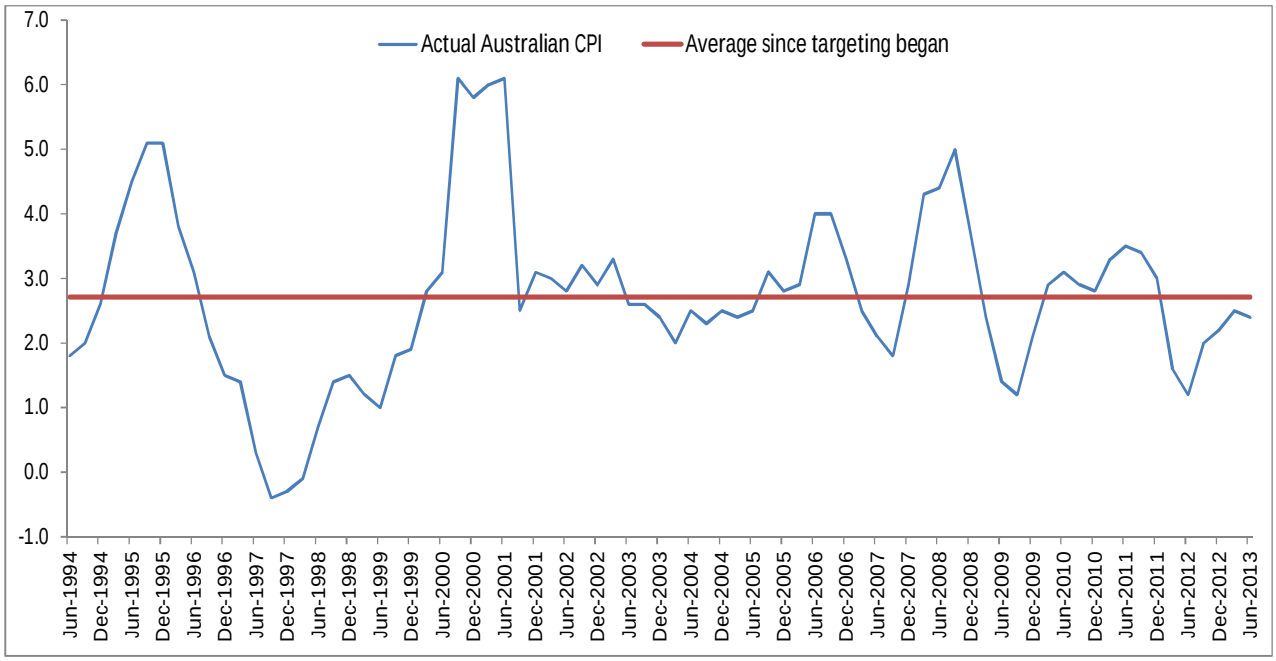
- Table 4 Annual Australian CPI % change forecast

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Annual % change	2.50%	2.25%	2.50%	2.50%	2.50%

In seeking to understand the overall reasonableness of such annual Australian CPI % change forecast, SKM established that since first targeting its current range of 2-3% in 1993, the RBA has historically achieved an actual average of 2.71% and over the most recent five years the actual average of 2.66%, both of which are higher than the expected midpoint of the target range of 2.5%.

This "above the midpoint of the RBA's targeting range" historic CPI result is illustrated in the following Figure 1.

- Figure 1 RBA historic CPI targeting results



SKM therefore considers that this methodology of including both the midpoint of the RBA target range and short term forecasts provides a conservative estimate of the likely position of this network cost pressure that can reasonably be expected to materialise over the upcoming regulatory control period.

3.2 Australian Trade Weighted Index (TWI)

The Australian TWI is a multilateral weighted average exchange rate index. It is the weighted average of exchange rates of Australian dollar against currencies of its most important trading countries, weighted to reflect the importance or the volume of trade with those countries. Therefore, the movement in the currencies of those countries with greater share of Australian's trade has greater effect on the index. The weightings of the various foreign currencies which make up the Australian TWI is annually updated or revised by the RBA based on the actual or new Australian-international trading data.

SKM uses the combination of Australian CPI and Australian TWI to describe the manufacturing activity for any imported good or equipment. The Australian TWI is also used to account for those materials or cost items in imported equipment whose price trend cannot be rationally or conclusively explained by the movement of commodities price.

In order to forecast the Australian TWI, SKM has assumed that the latest actual Australian TWI data as determined by the Reserve Bank of Australia (RBA) to continue at the same level in the foreseeable future. This is considered prudent because one of the variables influencing the Australian economic outlook, including the Australian CPI forecast, is the volume of Australian international trade and the relative position of the Australian currency against the currencies of its major trading economies, which is summarised by the Australian TWI indicator. The underlying fiscal policy of the RBA periodically published in the Statement of Monetary Policy requires the TWI to remain in the same present level in the foreseeable future. Therefore this forecast aligns with the RBA's assumption as documented in its August 2013 Statement on Monetary Policy.

The following steps are performed to forecast this economic indicator:

- Plot the most recent actual/ historical monthly average Australian TWI data from the RBA record (August 2013 month data for this modelling exercise);
- Extend the forecast Australian TWI going forward at the same level as the most recent actual data for every month of the forecast period;
- Apply linear interpolation between the above plotted index to form a continuous monthly data points for the entire duration of the forecast period; and
- Since this index data is annual measurements and take into account the movements over the previous 12 months, the data point from the last month (i.e. the 12th month data) of the annual period is considered to represent the index level for that year. Also, these data are fairly steady and constant, and generally moves in one predictable direction. Therefore, 'picking' the end 12th month data form an annual period and comparing it with the previous annual period's end 12th month data yields almost the same result as the comparison between the 12 month average from one annual period to 12 month average from the previous annual period.

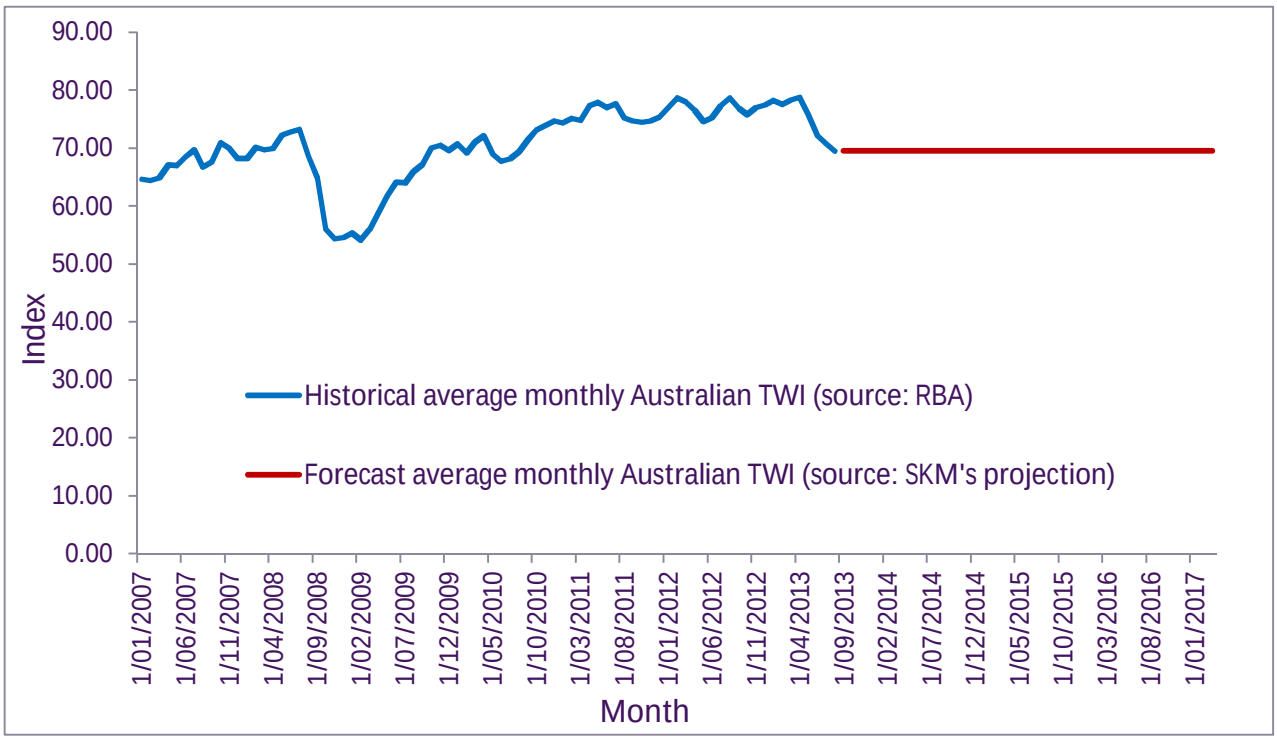
This annual Australian TWI forecast used during SKM modelling is presented in Table 5.

- Table 5 Annual Australian TWI % change forecast

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Australian TWI (at end month)	78.40	69.53	69.53	69.53	69.53
Annual % change	0.44%	-11.30%	0.00%	0.00%	0.00%

The recent historical monthly Australian TWI data as recorded by the RBA and SKM's projection for the future is illustrated in the following Figure 2.

- Figure 2 Historic Australian TWI and SKM's projection for future



3.3 Australian Dollar to US Dollar exchange rate

The SKM Cost Escalations modelling process uses the forecast USD/AUD exchange rates, to restate USD based forecast market prices of commodities, namely copper, aluminium, steel and oil, into their comparable AUD pricing movements. This is undertaken in order to account for any potential movements of base currency commodity market price movements through a strengthening or weakening of the AUD.

The following steps are performed to forecast this economic indicator:

- Plot the most recent actual/ historical monthly average USD/AUD exchange rate from the RBA record (August 2013 month data for this modelling exercise);
- Take an average of daily forward rate from the latest available complete month (August 2013) for each forward contract from Bloomberg;
- Thereafter, SKM has adopted the longer term historical average of 0.80 USD/AUD exchange rate as the long term forecast going forward; and
- Apply linear interpolation between the months without forward contract and long term average data point to form a continuous monthly data points for the entire duration of the forecast period.

The annual average of the twelve monthly USD/AUD exchange rate forecast data points as formed in the above steps is presented in the following Table 6.

- Table 6 Forecast annual average USD/AUD exchange rates

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
USD/AUD (annual average)	1.03	0.92	0.88	0.86	0.84

All forecast input pricing data quoted in USD at a future point in time is converted into AUD by using the USD/AUD exchange rate forecast from the same point in time.

3.4 US Consumer Price Index

The 'USA All Urban Consumer CPI-U' trend is referred as the US CPI to convert the US based input data from nominal to real term and vice versa.

The following steps are performed to forecast this economic indicator:

- Plot the most recent actual/ historical monthly US CPI data from the US Bureau of Labor Statistics record (July 2013 month data for this modelling exercise);
- Plot the ten calendar years of US CPI forecast data from the most recent (February 2013) The Budget and Economic Outlook publication of the US Congressional Budget Office; and
- Apply linear interpolation between the above plotted data to form a continuous monthly data points for the entire duration of the forecast period.

All forecast pricing data quoted in USD in nominal terms at a future point in time is converted into real term (or vice versa) by using the US CPI data from the same point in time.

3.5 Construction costs

Construction costs are included in the model as a key driver underlying network project construction costs, in order to account for price movements in materials elements of the civil works.

The Australian Construction Industry Forum (ACIF)[6] is the peak consultative organisation of the building and construction sectors in Australia. The ACIF has established the Construction Forecasting Council (CFC)[7] through which it provides a tool kit of analysis and information.

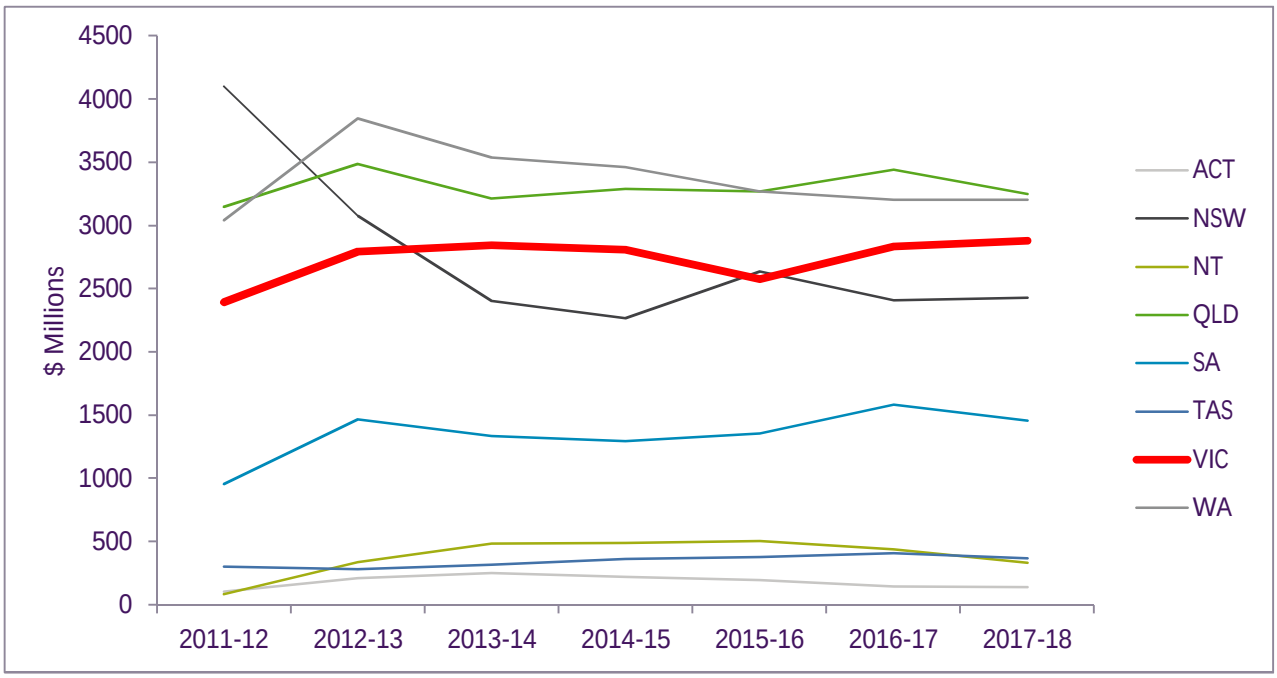
In commenting on activity related to the engineering construction specific to Victoria, the Construction Forecasting Council (CFC) in May 2013 notes the following:

> *"Little scope for growth over the forecast period"*[8]

Figure 3 illustrates the CFC's outlook for electricity and pipeline construction demand beyond 2016-17. This illustrates how Victoria may experience a moderating or flattening program of construction in this sector, particularly from 2012-13. The situation for the rest of Australia in the electricity and pipeline construction program is also very similar. Therefore, the construction cost indicator applicable for Victoria will be similar to that of the Australian average.

[6] http://www.acif.com.au
[7] http://www.cfc.acif.com.au/cfcinfo.asp
[8] http://www.acif.com.au/forecasts/summary/highlights-for-engineering-construction

- Figure 3 CFC Electricity and pipeline construction outlook [9]



As the CFC considers the overall electricity and pipeline construction activities in Australia to fall within the sector it presently entitles as "Engineering", SKM has adopted these movements presented as Australian National "Engineering" construction cost forecasts as the likely movements in the Australian wide construction material cost component of relevance to SPA within material cost escalation modelling.

The following steps are performed to forecast this economic indicator:

- Plot the most recent actual/ historical and forecast annual 'Engineering' construction price index from the CFC's toolkit;
- Apply linear interpolation between the above plotted index to form a continuous monthly data points for the entire duration of the forecast period; and
- Since this index data is annual measurements and take into account the movements over the previous 12 months, the data point from the last month (i.e. the 12th month data) of the annual period is considered to represent the index level for that year. Also, these data are fairly steady and constant, and generally moves in one predictable direction. Therefore, 'picking' the end 12th month data form an annual period and comparing it with the previous annual period's end 12th month data yields almost the same result as the comparison between the 12 month average from one annual period to 12 month average from the previous annual period.

Table 7 provides the relative excerpt of the CFC engineering construction real price index, based on the most recent data available on June 2013.

[9] http://www.cfc.acif.com.au/forecast_results.asp Downloaded 6/12/2010

- Table 7 CFC annual forecast of Engineering construction cost index

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Real price index	1.124	1.179	1.214	1.249	1.286
Annual % change	9.27%	4.87%	2.96%	2.93%	2.93%

3.6 Commodity prices

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

Commodity prices have been known to be volatile in recent times as they are influenced by several economic factors, such as overall levels of demand and supply as well as hedging and investment activity, each of which was effected by the 2008 Global Financial Crisis (GFC). Even outside of the period now known as the GFC, prices over a lengthy forward period such as the five year regulatory cycle can be difficult to pin down. It is therefore imperative to model these aspects of cost escalation using recent and credible data.

In seeking to develop appropriate cost escalation rates that effectively characterize the underlying infrastructure asset cost pressures faced by network service providers within Australia, the SKM modelling methodology incorporates the use of commodity futures contract prices into cost escalation rate computations.

3.6.1 Commodities and the use of futures contract pricing

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

The AER has a strong preference for the future contract market as the basis for forecasts as they 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.

SKM has thus adopted available futures prices into its forecast method, except where expressly noted. This is discussed in further detail in Section 3.6.3.

3.6.2 Credible views of a range of professional forecasters

The future price position in the case of copper and aluminium are only available for three years out to December 2016 (prompt dates) from the London Metal Exchange (LME) futures contracts. In order to estimate prices beyond this latest prompt date point, 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. This is because economic forecasts consider the changes in global market supply (additional production capacity and/or retirement of excess/old infrastructure) as well as changes in global demand.

This methodology reflects the approach accepted by the AER in the most recent Powerlink Revenue Determination in utilising Consensus Economics' [10] quarterly publication "Energy and Metals Consensus Forecasts" as the source from which the long-term position of the copper and aluminium market prices were sourced. These quarterly reports provide details of the price forecasts, of each professional analyst surveyed, for the next 10 quarters. "Energy & Metals Consensus Forecasts" also provides the "mean" or "consensus" of these various individual market predictions. In doing so, the publication allows the user to gather an overall

[10] Consensus Economics Inc. 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.

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 annual price movements for copper and aluminium, SKM uses a method of linear interpolation between the relevant December prompt date LME contract prices and the Consensus Economics long term predictions of price movements, as described in Section 3.6.3.

3.6.3 SKM's application of futures contracts and long-term forecasts

When updating the future 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 the likely year to date June average price positions of specific key cost components.

In order to estimate the impact of the Australian carbon price mechanism on the cost of materials and assets, SKM has assumed that there is no price impact on imported material / equipment. However, producers of locally manufactured materials and items of equipment can pass through half of the costs that they incur as a result of the mechanism (see detailed discussion in Section 4).

3.6.3.1 Aluminium and Copper

The price trends of aluminium and copper are used to account for those materials or cost items in equipment which are made from it or/and whose price trend can be clearly explained by the movement of these commodity prices.

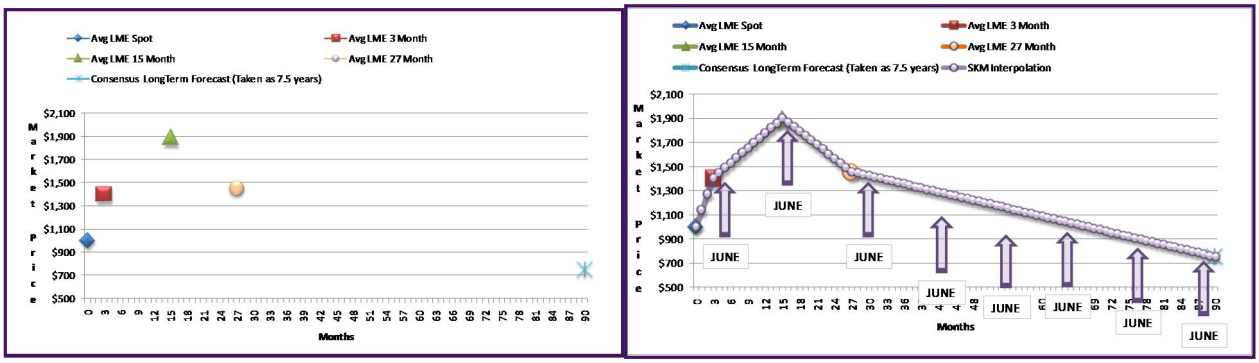
SKM employs an eight step approach to produce specific data points between which linear interpolation is applied in order to arrive at the year-to-March average future pricing positions for aluminium and copper. Due to the volatility in daily spot and futures market prices, SKM uses 12 months annual average prices within its modelling process. The steps involved are:

- Plot the daily average of the latest available complete month (August 2013) of LME spot prices;
- Plot the August 2013 daily average of the LME 3 month prices;
- Plot the August 2013 daily average of the LME December year 1 prices;
- Plot the August 2013 daily average of the LME December year 2 prices;
- Plot the August 2013 daily average of the LME December year 3 prices;
- Plot the August 2013 Consensus Economics Long Term forecast position (taken as 7.5 years from the survey date)[11];
- Apply linear interpolation between the plot points; and
- Since this price data trend fluctuate frequently and in both directions (increase or decrease), the year-to-March average (i.e. 12 months average) price data is considered to represent the price level for that April to March annual period.

This method is illustrated in Figure 4 (*note that the figures are illustrative only and do not refer to the actual position/price of any particular commodity*).

[11] 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.

- Figure 4 Diagram of method (illustrative only). Steps 1-6 (left) and steps 7-8 (right)



The average year from April to March input numbers used during SKM's modelling of the aluminium and copper market prices are presented in Table 8 and Table 9 respectively.

- Table 8 Real annual cost escalation indices of aluminium

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Annual average price in base year 2012-13 real AUD (without carbon price mechanism)	$1,925	$1,982	$2,146	$2,259	$2,361
% annual change	-15.60%	2.98%	8.27%	5.25%	4.51%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism continues to exists)**	$1,935	$1,995	$2,153	$2,266	$2,374
% annual change	-15.13%	3.07%	7.92%	5.28%	4.74%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism discontinue from July 2014)**	$1,935	$1,995	$2,150	$2,259	$2,361
% annual change	-15.13%	3.07%	7.77%	5.07%	4.51%

- Table 9 Real annual cost escalation indices of copper

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Annual average price in base year 2012-13 real AUD (without carbon price mechanism)	$7,677	$7,687	$7,943	$8,004	$8,047
% annual change	- 8.03%	0.13%	3.34%	0.76%	0.54%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism continues to exists)**	$7,678	$7,688	$7,944	$8,005	$8,049
% annual change	- 8.02%	0.13%	3.33%	0.76%	0.55%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism discontinue from July 2014)**	$7,678	$7,688	$7,944	$8,004	$8,047
% annual change	- 8.02%	0.13%	3.32%	0.76%	0.54%

3.6.3.2 Steel

The methodology utilised for aluminium and copper cannot be applied for the assessment of steel due to the lack of a liquid steel futures market. SKM notes that the LME commenced trading in steel futures in February 2008; however, the LME steel futures are still not yet sufficiently liquid to provide a robust price outlook. The current global production of steel averages 1,400 million tonnes per annum and the LME steel billet futures have a traded volume of approximately six million tonnes per annum, less than 0.5% of the global market.

SKM has therefore 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. The most recent Consensus Economics survey available at the time of compiling this report was the August 2013 Survey. This publication provided quarterly forecast market prices for steel till December 2015, as well as year 3 (2016), year 4 (2017), year 5 (2018), and a long-term forecast pricing position. SKM undertakes a seventeen step approach to produce specific data points between which linear interpolation is applied in order to arrive at the year-to-March average future pricing positions for steel. The steps involved are:

- Plot the latest available CE spot prices;
- Plot the CE 2 month prices;
- Plot the CE 5 month prices;
- Plot the CE 8 month prices;
- Plot the CE 11 month prices;
- Plot the CE 14 month prices;
- Plot the CE 17 month prices;
- Plot the CE 20 month prices;
- Plot the CE 23 month prices;
- Plot the CE 26 month prices;
- Plot the CE 29 month prices;

- Plot the CE 36 month prices;
- Plot the CE 48 month prices;
- Plot the CE 60 month prices;
- Plot the Consensus Economics long term forecast position (taken as 7.5 years from the survey date);
- Apply linear interpolation between the plot points; and
- Since this price data trend fluctuate frequently and in both directions (increase or decrease), the year-to-March average (i.e. 12 months average) price data is considered to represent the price level for that April to March annual period.

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

The Consensus Economics US HRC price forecasts are presented US$ per *Short Ton*. As historical prices are all quoted in US$ 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. 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 10, and are consistent with the methodology accepted by the AER in recent electricity network decisions.

- Table 10 Real annual cost escalation indices of average HRC steel

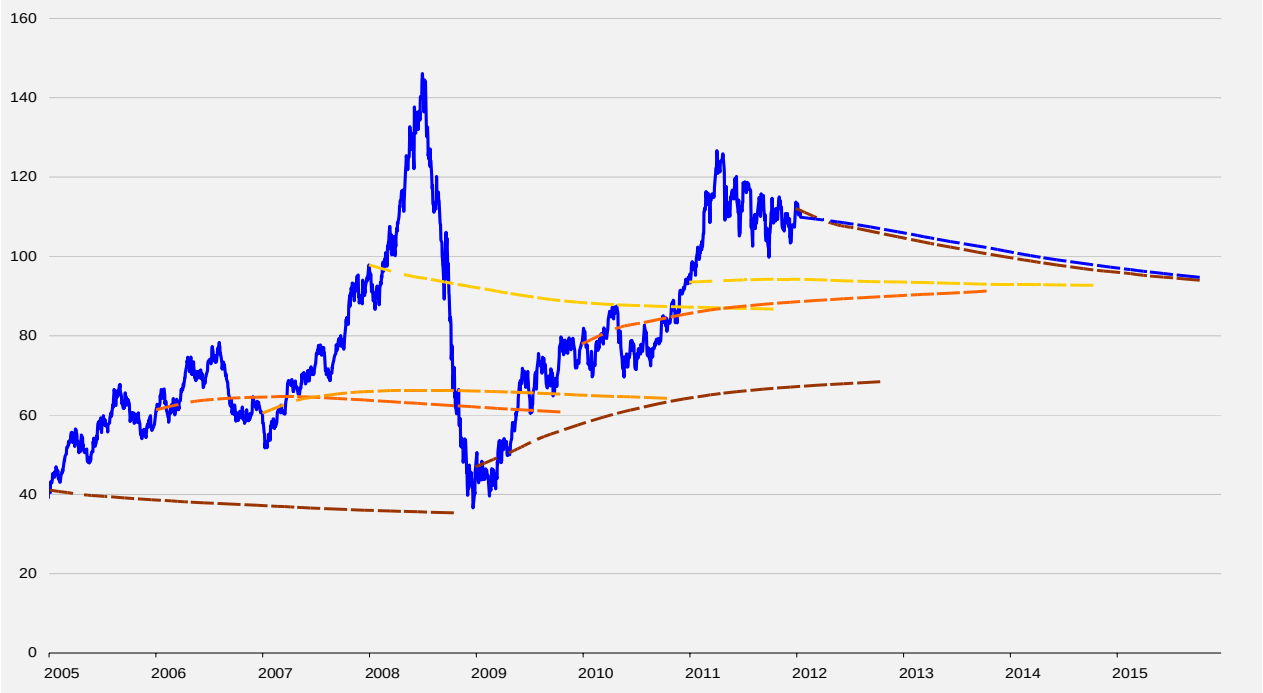
	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Annual average price in base year 2012-13 real AUD (without carbon price mechanism)	$661	$699	$749	$760	$784
% annual change	-12.62%	5.77%	7.11%	1.46%	3.13%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism continues to exists)**	$663	$701	$750	$761	$786
% annual change	-12.42%	5.80%	6.97%	1.48%	3.23%
Annual average price in base year 2012-13 real AUD **(Scenario: carbon price mechanism discontinue from July 2014)**	$663	$701	$750	$760	$784
% annual change	-12.42%	5.80%	6.91%	1.39%	3.13%

3.6.3.3 Oil

The world oil markets provide future contracts with settlement dates sufficiently far forward to cover the duration of SPA's upcoming regulatory control period. Various professional forecasts of oil prices from credible organisations to cover the duration of SPA's upcoming control period are also available.

SKM has researched[12] the reliability of oil future contracts as a predictor of actual oil prices, and has formed the view that futures markets solely are not a reliable predictor or robust foundation for future price forecasts. Futures contracts tend to follow the current spot price up and down, with a curve upwards or downwards reflecting *current* (short term) market sentiment. This is illustrated in the Figure 5, with the blue trend line showing the spot price, with 4 years of futures prices shown at annual intervals. The "flat" nature of the futures price curve is clearly seen, with only a small upward or downward trend in the early period, and with the *current* spot price clearly shown to be the primary determinant of futures prices as far as 4 years ahead.

- Figure 5 Oil (Brent[13]) futures compared to spot (blue trend line) 2005–2012



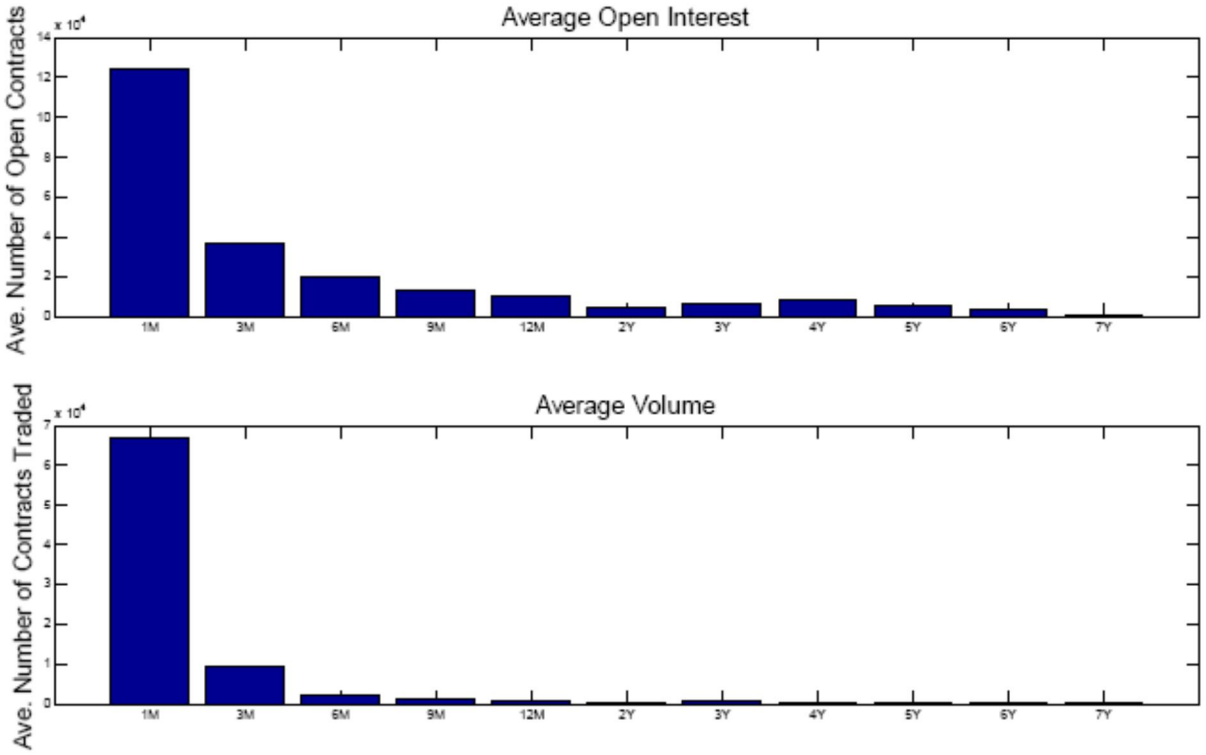
Source: Morgan Stanley Commodities

Future contract volumes beyond one year are low and the market is relatively illiquid, further highlighting the unsuitability of using futures prices as the basis of long term price expectations. As the chart in Figure 6 illustrates, beyond 3-6 months volumes and liquidity are very low.

[12] Refer *What do we learn from the price of crude oil futures?,* Alquist & Kilian, Journal of Applied Econometrics, February 2010, and *Forecasting the Price of Oil*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, July 2011

[13] While the chart refers to Brent futures, arbitrage opportunities ensure price disparities between West Texas Intermediate (WTI), Brent and other indices are low or with short term deviations related to specific supply constraints.

- Figure 6 Future oil market volumes showing open contracts and traded volumes



In order to find a more reliable and robust source of future oil prices, SKM compared the actual prices against the historical predictions of oil-WTI price using three sources from recent (2011 – 2013) years:

- NYMEX futures contracts
- The US Energy Information Administration (EIA) Annual Energy Outlook
- Consensus Economics' "*Energy and Metals Consensus Forecasts*"

While none of these sources can claim to be wholly reliable, SKM has found that generally, the economic forecast were consistently least inaccurate than the other two sources.

- Table 11 Average error in predicting future spot price (2011-2013)

Time forward from base date	Futures	EIA	CE
1 year	4%	17%	7%
2 year	10%	25%	7%
3 year	16%	28%	9%

Based on the least amount of error between the historical actual prices and the various types of historical available predictions (future contracts and forecasts), SKM has selected the Consensus Economics forecast to be the best currently available outlook for oil prices throughout the duration of the SPA's forecast period. Consensus provides quarterly forecast prices in the short term, and a "long term" (5-10 year) price. The most recent Consensus Economics survey available at the time of compiling this report was the August 2013 Survey. This publication provided quarterly forecast market prices for oil till December 2015, as well as year 3 (2016), year 4 (2017), year 5 (2018), and a long-term forecast pricing position. SKM undertakes a seventeen step approach to produce specific data points between which linear interpolation is applied in order to arrive at the year-to-March average future pricing positions for oil. The steps involved are:

- Plot the latest available CE spot prices;

- Plot the CE 2 month prices;
- Plot the CE 5 month prices;
- Plot the CE 8 month prices;
- Plot the CE 11 month prices;
- Plot the CE 14 month prices;
- Plot the CE 17 month prices;
- Plot the CE 20 month prices;
- Plot the CE 23 month prices;
- Plot the CE 26 month prices;
- Plot the CE 29 month prices;
- Plot the CE 36 month prices;
- Plot the CE 48 month prices;
- Plot the CE 60 month prices;
- Plot the Consensus Economics Long Term forecast position (taken as 7.5 years from the survey date);
- Apply linear interpolation between the plot points; and
- Since this price data trend fluctuate frequently and in both directions (increase or decrease), the year-to-March average (i.e. 12 months average) price data is considered to represent the price level for that April to March annual period.

The resultant forecast for real oil prices used as the basis for calculating escalation is shown in Table 12.

- Table 12 Real annual cost escalation indices of Oil-WTI

	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
	Historic	Forecast			
Annual average price in base year 2012-13 real AUD	$90	$105	$106	$104	$106
% annual change	-5.98%	16.65%	0.70%	-1.49%	1.62%

4. Impact of Carbon Price Mechanism

4.1 Basis of carbon pricing adjustments in the initial submission

The earlier SKM report (November 2012) submitted alongside the SPA's initial proposal to the AER provides escalation forecasts with and without carbon price scenarios. In assessing the carbon price impact, SKM took into account:

- The carbon price which was fixed for three years (from 1 July 2012 to 30 June 2015) and then floating through an emissions trading scheme (ETS). The 28 August 2012 announcement that from July 2015 the Australian CEF scheme will be linked with the current European carbon pricing scheme allowing the trading of permits between the two schemes was also incorporated. Hence, for carbon prices prior to July 2015 SKM used the prices fixed under the CEF while for carbon prices post-2015, SKM assumed a value which was half-way between the prices modelled by Federal Treasury and the forward contract prices quoted on the European Energy Exchange (EEX);
- Emissions intensity of emission intensive materials;
- Percentage of costs passed through to take account of the assistance to Emission Intensive Trade Exposed (EITE) industries, such as producers of aluminium, copper and steel, which were expected to reduce over time;
- Analysis of SPA's transmission electricity asset class, its component make-up profile, supplier's portfolio and available competitors, open market dynamics and international pricing pressure; and
- Assumption that there would be no carbon price impact on imported materials and products, but that local manufacturer could pass through only some extent (50%) of the additional carbon cost to customers.

4.2 AER review for draft determination

The AER generally accepted the methodology used for the carbon price impact assessment but considered that, due to time delay, the carbon pricing mechanism assumptions were out-dated[14]. For the draft determination the AER used a carbon price which was half-way between the Federal Government's forecasts from the 2013-14 Budget Papers[15] and the EEX futures contracts. The AER noted that it would further update the carbon pricing impact inputs for its final decision[16].

4.3 Changes since the SKM November 2012 report

There have been several material changes since the earlier SKM November 2012 report. These are:

- The ruling Government of the day announced in July 2013 that Australia would move to a floating price one year earlier, from 1 July 2014;
- The Government released its updated carbon price forecasts, taking the earlier move to a floating price into account, in the May 2013 budget ;
- The European emission prices have reduced;
- The AUD has depreciated against the USD and the Euro;
- A Federal election was called for 7 September 2013. The ruling Government of the day released a further updated carbon price forecast in the August 2013 Pre-election Economic and Fiscal Outlook (PEFO); and

[14] Australian Energy Regulator "Draft Decision, SP AusNet 2014-15 to 2016-17", August 2013, page 67.
[15] Australian Energy Regulator "Draft Decision, SP AusNet 2014-15 to 2016-17", August 2013, page 67.
[16] Australian Energy Regulator "Draft Decision, SP AusNet 2014-15 to 2016-17", August 2013, page 67.

- The Coalition formed the new Government after its victory in the 7 September 2013 Federal election. The new Government has clarified its position on carbon pricing mechanism.

SKM notes that the AER has considered only the first four of these in its draft decision.

4.3.1 Carbon pricing changes

At the time of the earlier SKM report (November 2012), the impact of the Federal Government's linkage to the European carbon pricing had not been projected by the Federal Government. SKM expected the linkage would act to reduce carbon prices in Australia. As there was no formal price projection put forward by the Federal Government at the time, SKM used as an indicative price a value which was half-way between the most recently available Federal Government's projections (which did not fully factor in the European linkage) and the forward contract prices on the EEX.

Since this time the Federal Government has prepared its own forecasts in both the May 2013 Budget (which did not take into account the move towards a floating price linked to the European scheme from 1 July 2014) and in the PEFO in August 2013 (which took into account the move towards a floating price linked to the European scheme from 1 July 2014 and exchange rate changes). For the PEFO, the Federal Government developed its most recent projections of applicable carbon price. The appropriate section of the PEFO is reproduced below.

> "*The PEFO incorporates the carbon price methodology introduced in the 2013-14 Budget. This methodology uses a three-month average of futures market prices in the forecast years, including the start of emissions trading in 2014-15. Carbon prices in the projection years of 2015-16 and 2016-17 are estimated using a linear transition from market prices to the longer-term modelled price of $38 in 2019-20 from the Strong Growth, Low Pollution Report. Based on this methodology, the carbon price is estimated to be $6.20 in 2014-15, $12.50 in 2015-16 and $18.90 in 2016-17.*
>
> *The longer-term modelled price is based on analysis contained in the Strong Growth, Low Pollution (SGLP) Report released in 2011. This modelling provides the latest available comprehensive assessment of the impact of global emissions reduction pledges for 2020 and the prices required to achieve the global environmental goals over time.*
>
> *While the modelling provides a longer-term estimate for prices in 2020, the carbon price path to 2020 is subject to considerable uncertainty. This price path will continue to be significantly affected by changes in the economic outlook in Europe following a period of profound economic weakness, as well as uncertainty associated with the impacts of short-term and structural reform proposals in the EU ETS. In light of these uncertainties, the use of a linear interpolation to derive carbon prices in the projection years is a simple, transparent approach.*
>
> *Futures contracts in the projection years are thinly traded, and market analyst views of the carbon price outlook to 2020 vary widely*"[17].

SKM considers it appropriate to use the latest Federal Government's projections of carbon prices, which take into account all of the relevant changed variables, as the appropriate projections for the carbon price. SKM does not consider it appropriate to average this value and the value of one set by European futures contracts as the latest Federal Government's projection already recognises the fall in the carbon price due to the linkage with the European ETS. As stated previously, this averaging approach was used by SKM in the earlier report (Nov 2012) only because the impact of announced policy changes had not been taken into account in the Government's projected prices at the time.

As a result, SKM considers it most appropriate to use the Government's latest price projections unchanged. The prices used by SKM for the relevant forecast years are, therefore, those in the PEFO report.

[17] Report by the Secretary to the Treasury and the Secretary of the Department of Finance and Deregulation, "Pre-election economic and fiscal outlook 2013" August 2013 page 55.

- Table 13 PEFO carbon pricing

	Jul12-Jun13	Jul13-Jun14	Jul14-Jun15	Jul15-Jun16	Jul16-Jun17
	Historic	Forecast			
Carbon price in nominal AUD ($/t CO_2e)	$23.00	$24.15	$6.20	$12.50	$18.90

For subsequent years, the price is projected to increase linearly to $38/t CO_2e by 2019-20 financial year.

4.4 Carbon pricing mechanism modelling

The effect of Clean Energy Future (CEF) scheme (or the carbon price mechanism) on cost drivers is modelled through the assignment of greenhouse emission intensity to each of the cost drivers. The emission intensity or embodied emission is measured in tonnes of CO_2 emitted per tonnes of produced commodity and is based on the prescribed data in the CEF scheme. These factors are multiplied by projected emissions permit prices to derive an additional "carbon price" effect for each of the individual input drivers or commodities. The model allows for different treatment of EITE commodities (e.g. Aluminium), in line with proposed compensation measures included in the December 2008 CEF White Paper and subsequent policy announcements. The model also draws on the information provided by SPA on the origin of all common standard asset categories (i.e. local vs. import vs. mix) to accurately consider the extent of influence of Australian carbon price in the production of such assets.

SKM considers that the impact of the Australian carbon price mechanism on imported material and components will be immaterial as the Australian carbon price is expected to have no or negligible impact on the international price of materials. While it is difficult to gauge the impact of the carbon price on locally manufactured materials and items of equipment, our methodology allows an estimate to be made of the additional carbon costs to local manufacturers which they might be able to pass through to customers. While SKM expects that local producers will attempt to pass through the additional costs to local consumers, it is not clear that such attempts will be successful. Depending on local market circumstances, actual outcomes might range between all or none of the incurred costs being passed through to customers. SKM considers it reasonable to assume that the ability of local manufacturers to pass through this additional carbon cost will be constrained to only half the cost incurred.

The calculations of carbon permit prices are summarised in Table 14.

- Table 14 Carbon pricing calculation

	Jul12-Jun13	Jul13-Jun14	Jul14-Jun15	Jul15-Jun16	Jul16-Jun17
	Historic	Forecast			
Carbon price in nominal AUD ($/t CO_2e) **(Scenario: carbon price mechanism continues to exists)**	$23.00	$24.15	$6.20	$12.50	$18.90
Carbon price in nominal AUD ($/t CO_2e) **(Scenario: carbon price mechanism discontinue from July 2014)**	$23.00	$24.15	---	---	---
Conversion to SPA's annual regulatory period					
	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
Carbon price in nominal AUD ($/t CO_2e) **(Scenario: carbon price mechanism continues to exists)**	$23.00	$23.86	$10.69	$10.93	$17.30

Carbon price in nominal AUD ($/t CO_2e) **(Scenario: carbon price mechanism discontinue from July 2014)**	$23.00	$23.86	$6.04	---	---
Carbon price in model base year 2012-13 real AUD ($/t CO_2e) **(Scenario: carbon price mechanism continues to exists)**	$23.00	$23.34	$10.20	$10.18	$15.73
Carbon price in model base year 2012-13 real AUD ($/t CO_2e) **(Scenario: carbon price mechanism discontinue from July 2014)**	$23.00	$23.34	$5.76	---	---

Coupled with the PEFO price, the total emissions intensity of each input cost driver is required to determine the anticipated impact on input prices. SKM has referred the prescribed data in the Commonwealth Government assessments of emissions intensive industries as shown in Table 15. The total emission intensity is the sum of direct and indirect emission intensity. Direct emission intensity reflects the emissions actually produced in the plant that manufactures the material, either from combustion of fossil fuels or from the chemical reactions or the industrial process involved. Indirect emissions cover the embedded emission in the inputs used (i.e. occurring outside of the plant), mainly imported electricity.

- Table 15 Total emission intensity of production

	Jul12-Jun13	Jul13-Jun14	Jul14-Jun15	Jul15-Jun16	Jul16-Jun17
	Historic	Forecast			
Aluminium (t CO2e/t Al3+)	17.00	17.00	17.00	17.00	17.00
Copper (t CO2e/t Cu)	1.95	1.95	1.95	1.95	1.95
Steel (t CO2e/t Fe)	2.37	2.37	2.37	2.37	2.37
Conversion to SPA's annual regulatory period					
	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
Aluminium (t CO2e/t Al3+)	17.00	17.00	17.00	17.00	17.00
Copper (t CO2e/t Cu)	1.95	1.95	1.95	1.95	1.95
Steel (t CO2e/t Fe)	2.37	2.37	2.37	2.37	2.37

Assistance for EITE industries is also part of current policy, with the percentage level of assistance sourced from Department of Climate Change documents relating to the operation of the EITE assistance scheme. The factors used in the CEF modelling are shown in Table 16 below. For EITE industries rated as "High" assistance starts at 94.5% in 2012-13 financial year and reduces by the carbon productivity contribution of 1.3% pa.

- Table 16 Carbon tax assistance (EITE) levels

	Jul12-Jun13	Jul13-Jun14	Jul14-Jun15	Jul15-Jun16	Jul16-Jun17
	Historic	Forecast			
Aluminium [EITE Level: High]	94.5%	93.3%	92.1%	90.9%	89.7%
Copper [EITE Level: High]	94.5%	93.3%	92.1%	90.9%	89.7%
Steel [EITE Level: High]	94.5%	93.3%	92.1%	90.9%	89.7%

Conversion to SPA's annual regulatory period					
	Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
Aluminium [EITE Level: High]	94.5%	93.6%	92.4%	91.2%	90.0%
Copper [EITE Level: High]	94.5%	93.6%	92.4%	91.2%	90.0%
Steel [EITE Level: High]	94.5%	93.6%	92.4%	91.2%	90.0%

Pass-through coefficients for each of these price impacts have been developed based on expected EITE assistance levels.

SKM has calculated the expected price impact on each of these commodities by multiplying the carbon price by the emissions intensity, subtracting the percentage impact of EITE existing assistance, to determine a per unit (tonne) emissions cost for each commodity. This impact was then added to the base commodity price forecast to determine a future price path including carbon price mechanism cost impacts. It was then assumed that, because of market constraints, local producers could only pass through half the additional costs incurred due the carbon price mechanism. Imported materials and items of equipment were assumed to be unaffected by the Australian carbon price mechanism.

SKM has modelled the following two assumptions or scenarios:

- The existing carbon price mechanism will continue to exist in the same form to March 2017; and
- The existing carbon price mechanism will discontinue from July 2014.

5. Response to the AER's Draft Decision

SKM notes the comments made by the AER in its draft decision relating to double-counting of labour costs in SP AusNet's capex forecasts due to the assumed inclusion of labour costs in SKM's materials escalators[18] and provides the following response.

Utility Labour was not an input into SKM's material escalators.

The presentation of 'General Labour' and 'Site Labour' cost escalation indices forecast presented in the Table 1 and Table 14 in the earlier SKM report (November 2012) was for illustration purpose only. These labour indices forecast were not included in the calculation of cost inputs used to determine the annual real material cost escalation forecast for SPA's asset classes. As such SKM's report did not provide any explanation on these labour indices.

The scope of SKM's engagement with SPA was to model and forecast 'Material' only escalation indices and accordingly SKM's forecast excluded cost components associated with project development, design, management, installation and commissioning activities of the capital assets. Thus the aggregation of the costs at the asset classes' level represents the cost of goods or equipment out of the "factory door" to be procured by SPA for its projects, in other words, 'Material' cost of the assets. It should be noted that SKM used the word 'Material' in the report title and diligently throughout the body of the report. Further to reinforce this scope, SKM also used the word 'Equipment' multiple times in body of the report to define the nature of the escalation indices.

SKM notes that the AER has misinterpreted the SKM's aggregation of the underlying cost drivers to form the material cost escalation indices for common SPA's asset classes in its draft decision by assuming that the asset class indices were inclusive of utility industry labour (general labour and site labour) cost components. While the AER acknowledges[19] that SKM's report does not provide any explanation on 'general labour' and 'site labour', it has erroneously reached this conclusion by referring to an old SKM report dating back to February 2007. This inference is out of context as SKM has continually refined and updated its modelling methodology in past 6.5 years. The AER's supposition regarding the inclusion of the utility industry labour cost component in the material cost escalation forecasted by SKM is incorrect. This means that the AER's concern in relation to the double-counting of labour in SPA's capex forecast is unfounded.

SKM's forecast of material cost escalation indices aggregated at SPA's standard asset classes were strictly made up of following underlying cost drivers:

- Australian CPI;
- Australian TWI;
- Copper price index;
- Aluminium price index;
- Oil price index;
- Steel price index; and
- Construction price index.

It is also noted that SKM performed the same aggregate calculation again in August 2013 using the underlying real cost driver indices forecast by the AER for the AER's draft decision[20]. SKM confirms that there has been no

[18] AER Draft Decision SP AusNet Transmission determination 2014-15 to 2016-17, Part 2 Attachments, Section 1.4.2 Material Cost Escalation, Page 67.

[19] AER Draft Decision SP AusNet Transmission determination 2014-15 to 2016-17, Part 2 Attachments, Section 1.4.2 Material Cost Escalation, Page 68.

[20] AER Draft Decision SP AusNet Transmission determination 2014-15 to 2016-17, Part 2 Attachments, Section 1.1 Draft decision, Table 1.2, Page 59.

difference between the proportional make-up profiles of the SPA's standard asset classes between this and the earlier calculation.

SKM notes that due to the time gap between the production of SKM's earlier forecast report and the AER's subsequent review of SPA's initial proposal, the modelling input parameters require updating with the latest available information. This update has been performed and is current as of the date of this report and is presented in Section 2, Section 3, and Section 4 of this report.

6. Comparative Analysis

It is noted that only the sourcing and the production methodology of the underlying cost drivers and economic indicators are different between the following three sets of forecasts:

- SKM's November 2012 forecast;
- The AER's July 2013 forecast included in its draft (Aug 2013) decision; and
- SKM's September 2013 update forecast

SKM notes that the forecast made at asset level in all the above three instances follows the same SKM's aggregation calculation with same proportional make-up profile which has remained consistent. The AER's forecast at asset level utilises SKM's aggregation methodology. Therefore any change between these three sets of forecast is solely due to the differing shapes of the underlying cost drivers and economic indicator trends. The three sets of these underlying cost drivers and economic indicator is illustrated in the following Table 17 and Figure 7 for the scenario where the carbon price mechanism continues to exist in the future.

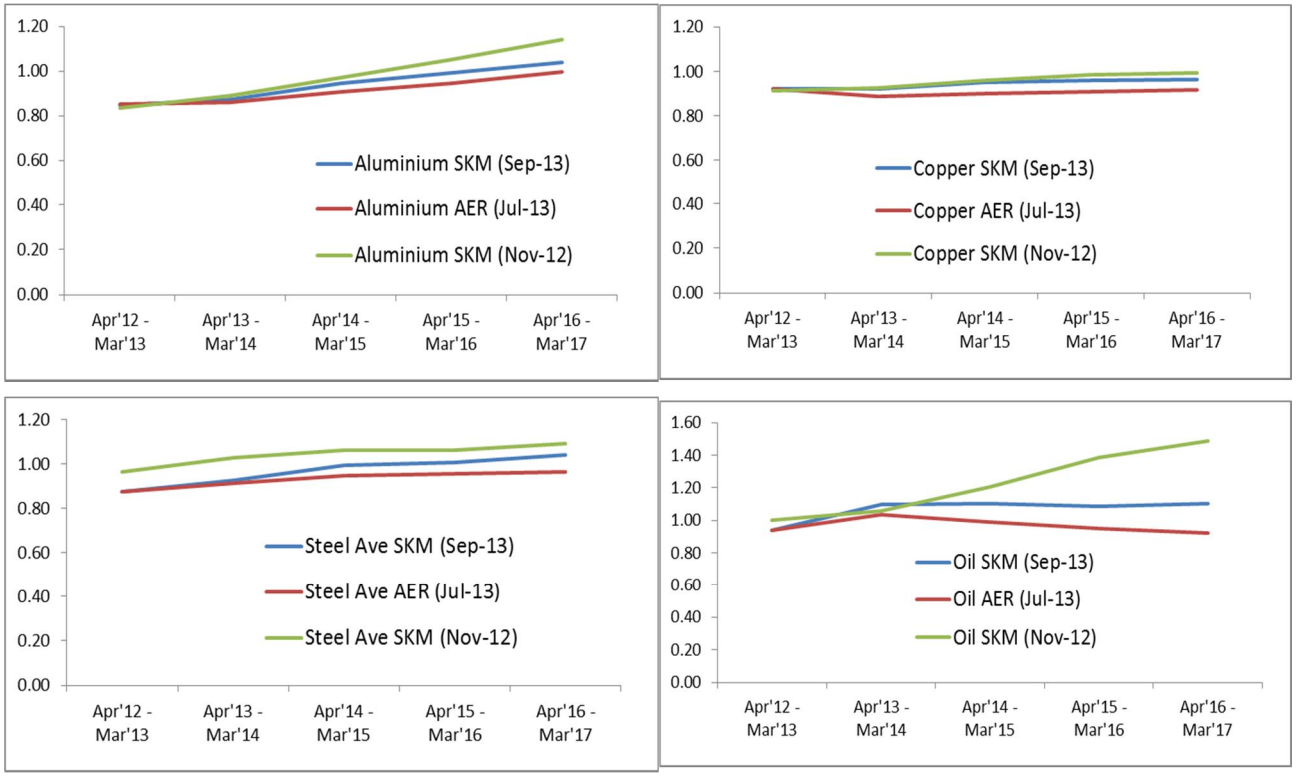
- Table 17 Cost driver and economic indicator trends used in three sets of forecast

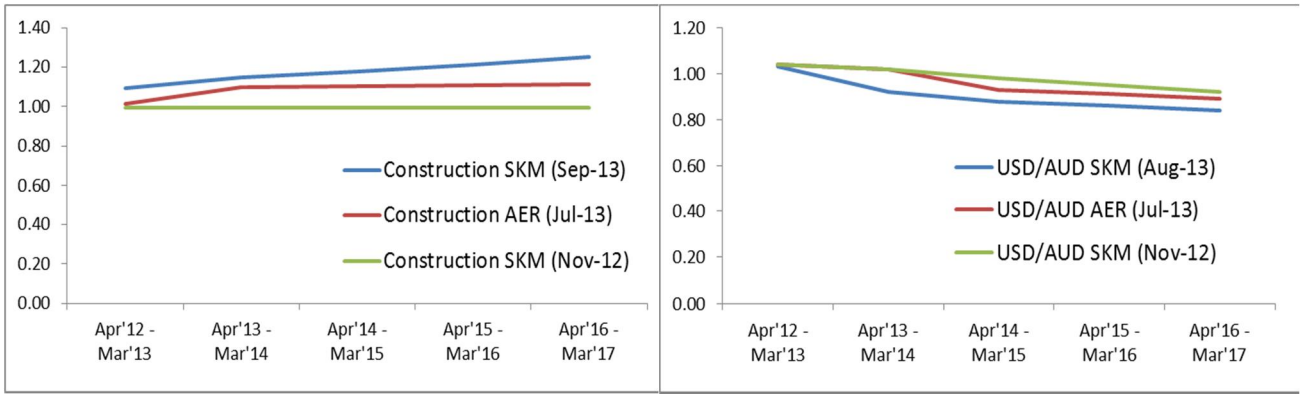
			Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
			Historic	Forecast			
Scenario: With the continuation of carbon price mechanism							
Aluminium	SKM (Sep-13)	Annual %Δ	-15.13%	3.07%	7.92%	5.28%	4.74%
		Cum Index	0.85	0.87	0.94	0.99	1.04
	AER (Jul-13)	Annual %Δ	-14.70%	0.80%	5.40%	4.60%	5.20%
		Cum Index	0.85	0.86	0.91	0.95	1.00
	SKM (Nov-12)	Annual %Δ	-16.40%	6.60%	9.20%	7.90%	8.50%
		Cum Index	0.84	0.89	0.97	1.05	1.14
Copper	SKM (Sep-13)	Annual %Δ	-8.02%	0.13%	3.33%	0.76%	0.55%
		Cum Index	0.92	0.92	0.95	0.96	0.96
	AER (Jul-13)	Annual %Δ	-7.90%	-3.80%	1.50%	1.10%	0.80%
		Cum Index	0.92	0.89	0.90	0.91	0.92
	SKM (Nov-12)	Annual %Δ	-9.00%	1.80%	3.60%	2.70%	0.80%
		Cum Index	0.91	0.93	0.96	0.99	0.99
Steel Ave	SKM (Sep-13)	Annual %Δ	-12.42%	5.80%	6.97%	1.48%	3.23%
		Cum Index	0.88	0.93	0.99	1.01	1.04
	AER (Jul-13)	Annual %Δ	-12.80%	4.70%	3.40%	1.30%	0.80%
		Cum Index	0.87	0.91	0.94	0.96	0.96
	SKM (Nov-12)	Annual %Δ	-3.70%	6.50%	3.60%	-0.10%	2.80%
		Cum Index	0.96	1.03	1.06	1.06	1.09
Oil	SKM (Sep-13)	Annual %Δ	-5.98%	16.65%	0.70%	-1.49%	1.62%
		Cum Index	0.94	1.10	1.10	1.09	1.11
	AER (Jul-13)	Annual %Δ	-5.90%	9.90%	-4.10%	-4.20%	-2.90%
		Cum Index	0.94	1.03	0.99	0.95	0.92
	SKM (Nov-12)	Annual %Δ	0.40%	5.60%	13.70%	14.90%	7.60%
		Cum Index	1.00	1.06	1.21	1.39	1.49

			Apr12-Mar13	Apr13-Mar14	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17
			Historic	Forecast			
Scenario: With the continuation of carbon price mechanism							
Construction	SKM (Sep-13)	Annual %Δ	9.27%	4.87%	2.96%	2.93%	2.93%
		Cum Index	1.09	1.15	1.18	1.21	1.25
	AER (Jul-13)	Annual %Δ	1.30%	8.30%	0.50%	0.40%	0.40%
		Cum Index	1.01	1.10	1.10	1.11	1.11
	SKM (Nov-12)	Annual %Δ	-0.40%	0.00%	-0.20%	0.10%	0.00%
		Cum Index	1.00	1.00	0.99	1.00	1.00
USD/AUD	SKM (Aug-13)	Rate	1.03	0.92	0.88	0.86	0.84
	AER (Jul-13)	Rate	1.04	1.02	0.93	0.91	0.89
	SKM (Nov-12)	Rate	1.04	1.02	0.98	0.95	0.92

[Note: SKM's updated forecast for the Apr13-Mar14 period consists of a combination of actual or historic data till Aug or Sep 2013 and forecast data thereafter for the remaining period]

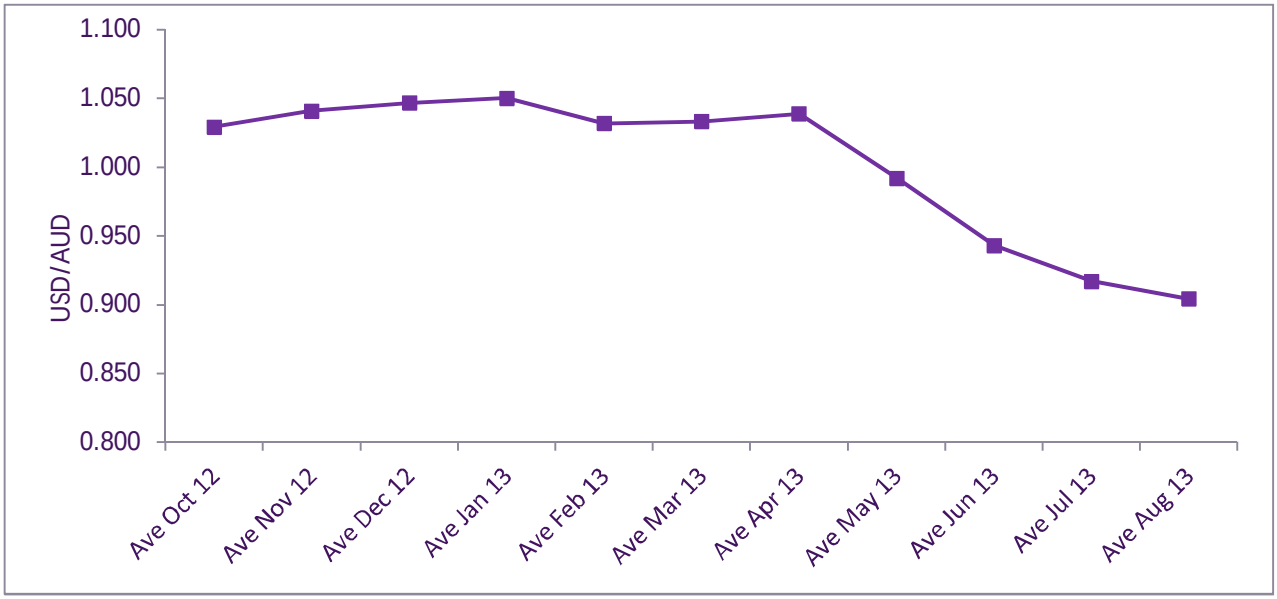
- Figure 7 Cost driver and economic indicator trends used in three sets of forecast





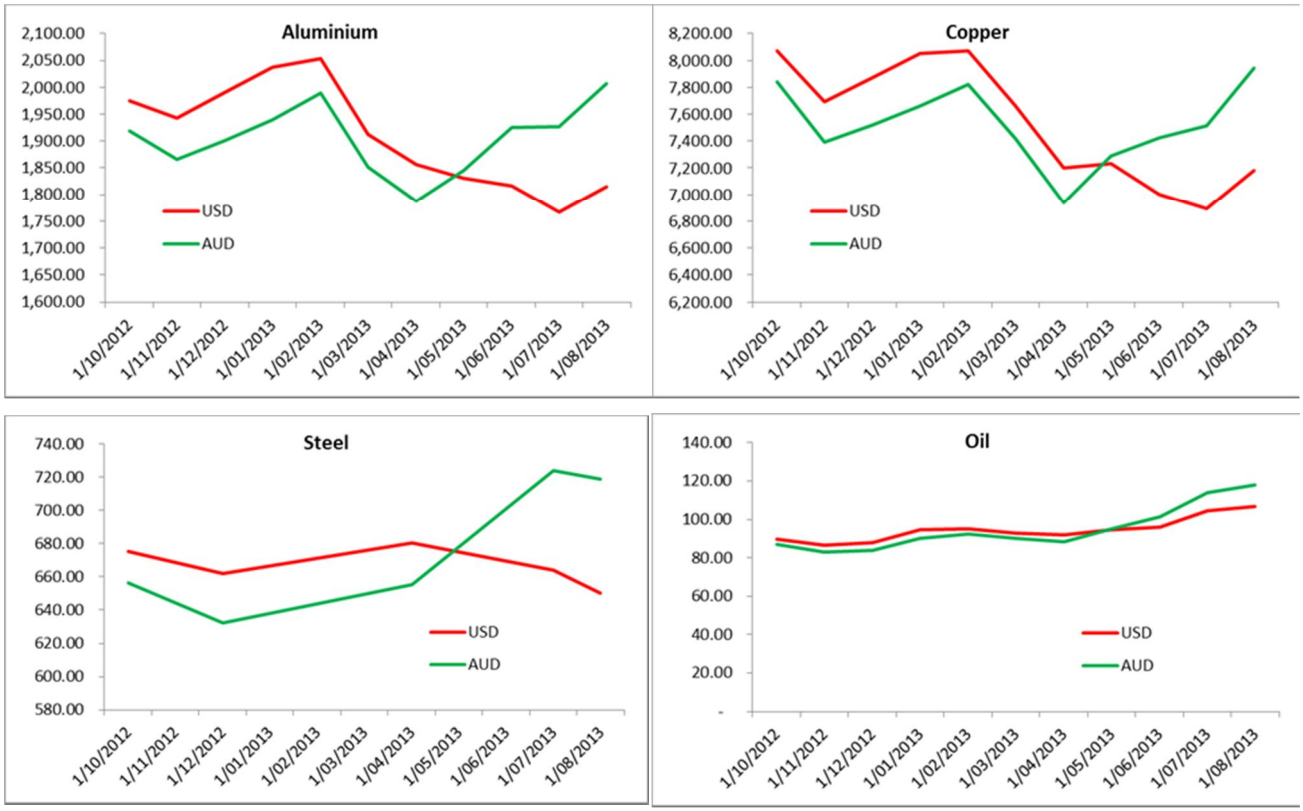
SKM makes the following observations when comparing these three sets of forecast, each of which has some degree of influence. These observation topics have resulted in changing the shape of the price trends in subsequent updates since SKM's November 2012 forecast.

- The commodity price forecast has moderate in the latest available set of market information as compared to the SKM's November 2012 forecast;
- The FOREX rate movement, especially the USD/AUD exchange rate has changed materially (AUD has depreciated against USD) between November 2012 and August 2013 as shown in Figure 8. It can be seen that the USD/AUD exchange rate which was consistently floating above parity in the months of November 2012 to April 2013 gradually started to fall and by August 2013 it was approx. 0.90. This fall in the FOREX rate in recent months has influenced the commodity prices quoted in USD to become more expensive (in AUD) in recent months.
- Figure 8 Historical monthly average USD/AUD exchange rate



- The actual/historical prices of commodities (except for oil) quoted in USD in the international market which sets the reference or 'starting' point for the forecast price trends generally decreased from November 2012 to August 2013. However, this decrease is offset when the USD trend line is converted to AUD prices due to the influence of the depreciating AUD against the USD. In fact, in most cases the influence of the recent FOREX rate changes overcomes and supersedes the recent drop in USD price trends. This can be seen in Figure 9.

- Figure 9 Historical commodities monthly average price in USD (and AUD for those months)



- SKM has no knowledge regarding the sources and type of input data used by the AER to produce the underlying cost drivers and economic trends and therefore cannot conclusively comment on its characteristics. However, it is observed that the recent movement in the FOREX rate is not the only influencing factor for the commodity price escalation trend because at the time of the AER forecast the USD/AUD FOREX rate was in between SKM's November 2012 and September 2013 forecasts, but the AER commodity price trends are not in between SKM's commodity price trends. Hence it is assumed that the forecast trends quoted in USD for the AER sourced commodity prices must be very moderating or decreasing;
- Change in some elements of the carbon pricing mechanism, especially the timing of commencement of floating price, as detailed in Section 4.3 subsequent to SKM's November 2012 forecast and therefore not modelled in that forecast; and
- While SKM ensured that it converted all the available July-to-June input data (such as carbon price and EITE assistance level) into the respective corresponding years' April-to-March data in its both forecasts, the AER has not performed similar conversion to its input data for its forecast. For example, the AER has calculated its underlying cost driver escalation for April 2014–March 2015 period by using the input data applicable for July 2014–June 2015 period.

7. Conclusion

The SKM cost escalation modelling methodology provides a rigorous and transparent process through which reasonable and appropriate cost escalation indices are able to be developed.

The real escalation factors established during this assignment were developed with specific consideration of the operating environment faced by SPA, and were based on the most up-to-date information available at the time of compilation. These real indices therefore constitute SKM's calculated opinion of appropriate materials cost escalation rates that can reasonably be expected to affect SPA over the upcoming revenue regulation period.

The summary of all the forecast indices of input cost drivers and economic indicators, as explained in Section 3 and Section 4 in detail, are presented in Table 1 in the Executive Summary. The figures in Table 1 in the Executive Summary with carbon price mechanism exclude the impact for the SF_6 import levy.

Table 2 in the Executive Summary presents the real annual material cost escalation indices forecast based on the movements in underlying cost drivers and economic indicators, but aggregated at common standard asset class level used by SPA. The inclusion of the Australian carbon emissions costs gives due consideration to SPA's asset supplier profile, market competition and international pricing pressure. In order to aggregate the input cost drivers at this level, SKM assigned appropriate weightings for the relative contribution of each of the input cost drivers and economic indicator to the final asset or project costs.

It is noted that not all SPA's asset class is impacted by the existence or continuation of the Australian carbon price mechanism. The modelled forecast indices are based on the assumption that the carbon cost impact will be partially (estimated at 50%) passed through for locally manufactured items of equipment, but not impact prices at all for fully imported items. This partial pass through assumption is considered prudent given that some locally manufactured items will be made from imported materials and that competition in the market may act to constrain the ability of local producers to pass through to customers the full cost impact.

The underlying cost drivers for some asset classes such as Communication, Vehicles and IT closely reflects the Australian CPI trend and as such no real cost escalation is implied.

In exerting the expected cost pressures on SPA, SKM concludes that these real material escalation forecasts form a component of efficient prices for an Australian electricity network business. SKM therefore recommends that SPA take account of these real material cost escalation forecasts within their forthcoming regulatory expenditure proposal.