ElectraNet Transmission Network Revised Revenue Proposal

Appendix E CEG, *Escalation factors affecting expenditure forecasts*, January 2013

COMPETITION ECONOMISTS GROUP

Escalation factors affecting expenditure forecasts

FINAL REPORT

January 2013

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Executive summary

1. ElectraNet has engaged CEG to provide an update to the annual material escalators and exchange rates used in the Australian Energy Regulator's draft determination for the purposes of their Revised Proposal. The escalation factors are to be applied to forecast operating and capital expenditures based on changes in unit costs.

2. We have developed material cost escalation factors for:

   - aluminium;
   - copper;
   - steel;
   - crude oil; and
   - construction.

3. In order to estimate a set of escalation factors to extend forward ElectraNet's costs, it is necessary to form a view about the future movements of commodity prices. The methodology that we have adopted in this report is to source predictions of future prices for these inputs, whether in the form of futures prices or expert forecasts, and to rely on these data to develop escalation factors. Where futures prices are available and are sufficiently liquid, we have used these in preference to forecasts on the basis that these represent the best forecast of prices by informed market participants. A full description of our methodology is set out in our May 2012 report for ElectraNet.[1]

4. Issues of consistency in timing are important to the development of escalation factors, because their function is to project forward prices or costs from one period to another. We report escalation factors based on escalation to both:

   - the mid-point of each financial year, using the forecast change in average costs between financial year (which we call 'financial year' escalators); and
   - the end of each financial year, using the change in average costs over each calendar year (which we call 'calendar year' escalators).

5. We understand that the base period applying to the objects to be escalated by ElectraNet is 1 July 2011. We have developed full sets of financial year and calendar year escalators based in this period.

6. In general, the methodology applied in this report to estimate escalation factors is characterised by a high degree of transparency over the use of input data to estimate

[1] CEG, *Escalation factors affecting expenditure forecasts: a report for ElectraNet*, May 2012.

escalation factors and is consistent with the methodology applied by the AER in its calculation of escalation factors for regulated energy network businesses.

7. The following two tables show cost escalators calculated on this basis in real and nominal terms respectively. Each table contains escalation factors calculated on both a financial year and a calendar year basis, as described above.

Table 1: Base period 1 July 2011, real escalators

Financial year	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Aluminium	-13.1%	-8.0%	6.9%	4.4%	3.4%	3.0%	2.7%
Copper	-7.0%	-5.2%	1.7%	0.3%	-2.6%	-3.6%	-4.0%
Crude oil	1.7%	-8.5%	1.0%	-0.9%	-1.4%	-0.9%	-0.6%
Steel	-2.7%	-13.6%	2.8%	3.1%	0.8%	0.8%	0.5%
Construction	-0.5%	0.3%	-0.1%	0.4%	0.4%	0.1%	0.1%
Calendar year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Aluminium	-19.8%	4.2%	4.6%	4.0%	3.1%	2.9%	2.5%
Copper	-10.5%	-0.2%	0.6%	-0.9%	-3.5%	-3.8%	-4.2%
Crude oil	-0.7%	-6.3%	0.6%	-1.3%	-1.1%	-0.7%	-0.6%
Steel	-10.5%	-5.8%	4.7%	1.3%	0.9%	0.7%	0.4%
Construction	-0.4%	0.1%	0.2%	0.4%	0.2%	0.1%	-0.2%

Table 2: Base period 1 July 2011, nominal escalators

Financial year	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Aluminium	-12.5%	-5.6%	9.6%	7.0%	6.0%	5.6%	5.3%
Copper	-6.4%	-2.8%	4.2%	2.9%	-0.2%	-1.2%	-1.6%
Crude oil	2.3%	-6.2%	3.6%	1.6%	1.1%	1.6%	1.9%
Steel	-2.1%	-11.5%	5.4%	5.7%	3.3%	3.3%	3.1%
Construction	0.3%	3.0%	2.4%	3.0%	2.9%	2.6%	2.6%
Calendar year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Aluminium	-18.4%	7.1%	7.2%	6.6%	5.7%	5.4%	5.1%
Copper	-8.9%	2.6%	3.1%	1.6%	-1.0%	-1.4%	-1.8%
Crude oil	0.9%	-3.6%	3.1%	1.1%	1.3%	1.8%	1.9%
Steel	-9.0%	-3.1%	7.3%	3.8%	3.4%	3.2%	2.9%
Construction	1.5%	3.0%	2.7%	3.0%	2.7%	2.6%	2.3%

1 Introduction

8. ElectraNet has engaged CEG to provide an update to the annual material escalators and exchange rates used in the AER's draft determination for the purposes of their Revised Proposal. The escalation factors are to be applied to forecast operating and capital expenditures based on changes in unit costs.

9. We have developed material cost escalation factors for:

   - aluminium;
   - copper;
   - steel;
   - crude oil; and
   - construction.

10. A full description of our methodology is set out in our May 2012 report.[2] The escalation factors estimated in this report reflect an update to the input data utilised in our earlier report. However, the methodology and data sources that we rely upon to estimate these escalation factors remains unchanged.

11. The remainder of this report is set out as follows:

    - Section 2 summarises the basis for our calculation of each material escalation factor and the data used to update these. The updated forecasts are compared to those from our previous report; and
    - Section 3 sets out the basis for the updated inflation and exchange rate inputs that underpin calculation of the updated escalation factors in this report.

[2] CEG, *Escalation factors affecting expenditure forecasts: a report for Envestra*, May 2012.

2 Forecasts of material cost inputs

12. This section sets out the material cost escalation factors, together with a brief description of their sources. For a full account of our methodology please refer to our May 2012 report.

2.1 Aluminium and copper

13. Consistent with our previous reports, we have obtained London Metals Exchange (LME) prices for all aluminium and copper futures. We have used an average futures price over the first half of December 2012. The longest dated LME future for these products is 27 months, allowing us to forecast prices out to and including March 2015 by interpolating between future prices. However, available future prices do not extend beyond this period.

14. Beyond this date, we use a 'long-term' forecast of the price for aluminium and copper from professional forecaster Consensus Economics. Consensus Economics performs surveys of forecasters' opinions on future commodity prices. Its most recent survey was published in October 2012[3].

15. Consensus Economics does not provide any information regarding their long-term forecast, including who contributed or the range of the forecasts. The long-term forecasts are 5-10 year average estimates in nominal 2012 dollar terms. As such we have assumed they are for 7.5 years.

16. We use this approach to produce monthly series of aluminium and copper prices, which are averaged to estimate financial year escalators out to 2017/18. The updated escalation factors are shown in Table 3 below.

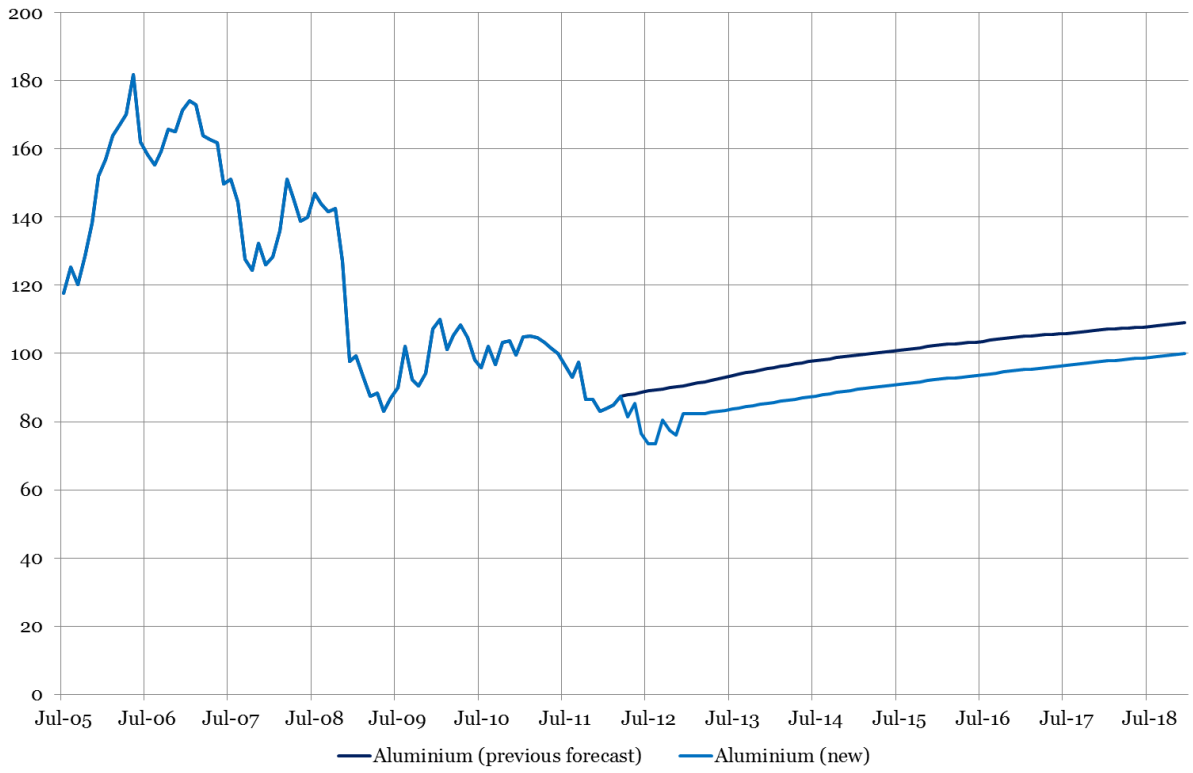
Table 3: Escalation factors for aluminium and copper, real

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Aluminium	-13.1%	-8.0%	6.9%	4.4%	3.4%	3.0%	2.7%
Copper	-7.0%	-5.2%	1.7%	0.3%	-2.6%	-3.6%	-4.0%

17. Figure 1 below shows the price trend implied by the updated escalation factors for aluminium (light blue line). It also shows the forecast provided in May 2012, based on data from March 2012 (in the darker blue). Figure 2 shows the same information for copper.

3 Consensus Economics, *Energy & Metals Consensus Forecasts,* October 2012

Figure 1: Price levels for aluminium, real



June 2011 = 100
Source: Bloomberg, Consensus Economics, CEG Analysis

18. Notably, the nominal price of both aluminium and copper has fallen since March 2012. This decrease in price is reflected in the escalation factors for the initial years, which are more negative in comparison to the escalation factors calculated for the May 2012 report. The prices of futures and the forecast prices of aluminium and copper have also fallen since March 2012.

Figure 2: Price levels for copper, real

June 2011 = 100
Source: Bloomberg, Consensus Economics, CEG Analysis

2.2 Steel

19. A component of ElectraNet's costs is associated with the purchase of products using steel, including for example construction of transformers and sub-stations.

20. We have relied on forecasts for hot-rolled coil (HRC) for Asian steel prices provided by Consensus Economics[4]. This is consistent with our previous work and the methodology accepted by the AER. These forecasts are in an identical format to those for aluminium and copper, with quarterly short-term nominal forecasts and a long term nominal forecast. We have relied on a historical series derived from Bloomberg (MEPS Asia carbon steel products).

21. The escalation factors derived on the basis of the MEPS historical series combined with the short term and long term Consensus Economics forecasts are shown in Table 4 below.

4 Previous analysis conducted by CEG and accepted by the AER has relied on an average of forecasts for Hot Rolled Coil for European and US steel prices. However, Consensus Economics currently also publish forecasts specific to the Asian market, which are more relevant in this context. The Asia steel prices were used in CEG's previous report for ElectraNet (May 2012).

Table 4: Escalation factors for steel, real

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Steel	-2.7%	-13.6%	2.8%	3.1%	0.8%	0.8%	0.5%

22. Figure 3 shows the price trend implied by the updated escalation factors for steel (light blue line). It also shows the forecast provided in May 2012 (in the darker blue) based on data from March 2012.

Figure 3: Price levels for steel, real

June 2011 = 100
Source: Bloomberg, Consensus Economics, CEG Analysis

23. The price of steel has fallen since March 2012, aside from a spike in May due principally to exchange rate volatility. The forecasts from Consensus are also lower than in our previous report.

2.3 Crude oil

24. To source estimates of historical and forecast changes in crude oil prices we have followed largely the same approach used for aluminium and copper, but with alternative data sources specific to crude oil.

25. Historical data on crude oil prices have been sourced from the US Department of Energy (DoE)[5]. Crude oil futures (NYMEX Crude Oil Light) have been sourced from the Chicago Mercantile Exchange (via Bloomberg). We have averaged NYMEX prices over 15 November and 13 December 2012 for use in the estimation of escalation factors.

26. NYMEX futures are available up to December 2021 and, consequently, these can be relied upon to develop forecasts of future prices without the use of forecasts from Consensus Economics or other professional forecasters. We have combined forecasts calculated on the basis of linear interpolation between each average futures price with the historical data sourced from DoE. These calculations give rise to the escalators for crude oil shown in Table 5 below.

Table 5: Escalation factors for crude oil, real

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Crude oil	1.7%	-8.5%	1.0%	-0.9%	-1.4%	-0.9%	-0.6%

27. Figure 4 below shows the price trend implied by the updated escalation factors for crude oil (light blue line). It also shows the forecast provided in May 2012 (darker blue) based on data from March 2012.

5 Consistent with the approach used by the AER, we have used monthly prices for West Texas Intermediate crude.

Figure 4: Price levels for crude oil, real

June 2011 = 100
Source: Bloomberg, Consensus Economics, CEG Analysis

28. The actual price of crude oil has fallen since March 2012, but with an uptick in August and September 2012. Also the futures price for crude oil on the Chicago Mercantile Exchange has fallen since March. This is reflected in the results in Figure 4.

2.4 Construction

29. CEG has updated the forecasts available from the Construction Forecasting Council (CFC). The forecasts sourced by CEG have been updated as of October 2012.

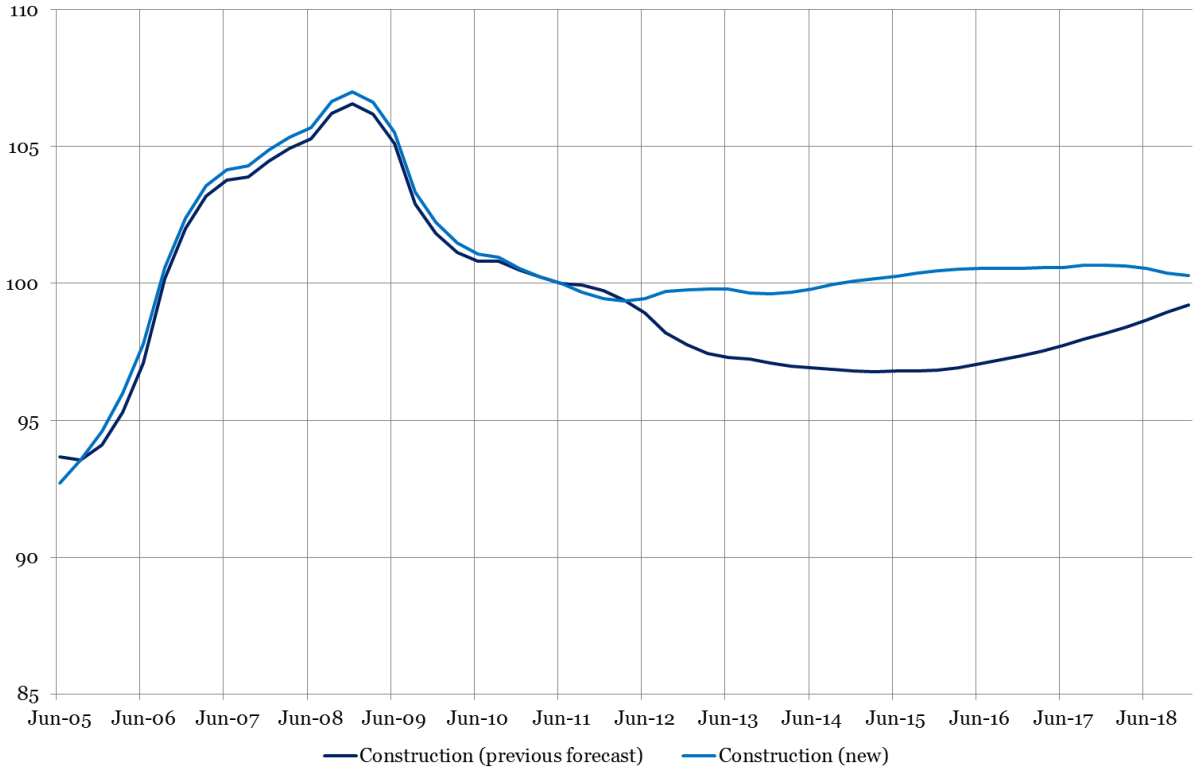
30. The construction forecasts are expressed in terms of the average price movement between financial years, so we have converted these to a quarterly index using the formulae set out in our May 2012 report. The escalation factors calculated on this basis are shown in Table 6 below.

Table 6: Escalation factors for construction, real

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Construction	-0.5%	0.3%	-0.1%	0.4%	0.4%	0.1%	0.1%

31. Figure 5 shows the updated price levels for construction (light blue line). It also shows the forecast provided in May 2012 (in darker blue) based on data from March 2012.

Figure 5: Price levels for construction, real



June 2011 = 100
Source: Bloomberg, Consensus Economics, CEG Analysis

32. Overall, the CFC forecasts reflect a higher (or less negative) outlook for construction prices than was predicted in May 2012. However, the historical price series in Figure 5 above varies slightly between our earlier report and the updated data. This is because of changes made by the CFC to its historical information. We note that the difference between its estimates is not material to the escalation factors that we derive in this report.

3 Inflation and exchange rates

33. Underlying our updated estimates of material cost escalation factors are updated data and forecasts for inflation and exchange rates. This section sets out the basis on which we have updated these in our modelling.

3.1 Inflation

34. We continue to rely upon forecasts published by the RBA in its quarterly Statement on Monetary Policy as the basis for forecasting the rate of inflation. Our updated escalation factors are converted into real terms based upon inflation forecasts obtained from the economic outlook section of the November Statement.[6] Updates to actual inflation are obtained from the Australian Bureau of Statistics.[7]

35. The November Statement contains the RBA's forecasts of inflation out to and including for the year ending December 2014. Beyond this period, we assume annual inflation at 2.50%, being the mid-point of the RBA's target range.

3.2 Exchange rates

36. As we described in our earlier report, we source historical monthly exchange rates from the RBA. Forecasts for the exchange rate to the United States dollar are obtained using Bloomberg's forward exchange rates, which are available over a very long horizon. The Bloomberg forward rates have been updated for this report to the month ending 12 December 2012.

37. The historical and forecast exchange rates which are used in the model are summarised in Table 7 below.

6 RBA, *Statement on Monetary Policy*, November 2012, p. 67

7 ABS, *Consumer Price Index*, September 2012, Catalogue No. 6401.0.

Table 7: Average financial year exchange rates

Financial year	USD/AUD	AUD/USD
2008-09	0.744	1.344
2009-10	0.884	1.131
2010-11	0.999	1.001
2011-12	1.036	0.965
2012-13	1.038	0.964
2013-14	1.014	0.987
2014-15	0.986	1.015
2015-16	0.957	1.045
2016-17	0.931	1.074
2017-18	0.907	1.102
2018-19	0.886	1.129

Source: RBA data, Bloomberg futures