Attachment 5.16

Overview of the cost escalation methodology

May 2014

Contents

1. Introduction

As a regulated NSP, Ausgrid is entitled to recover a risk adjusted return on the efficient costs of service provision. Under current regulatory arrangements Ausgrid forecasts costs, on this occasion to 2019. Over this time period it is highly likely that input costs will change in real terms (and in recent years the trend has been for real increases). Drivers of real cost increases vary and there are different approaches to managing them efficiently and for considering them as part of ex-ante forecasts.

Ausgrid's view is that, as long as the mitigation of real cost increases is prudent and efficient these forecasts should be included in agreed capex allowances. Ausgrid's approach to managing cost increases is consistent with those suggested during consultation for the Better Regulation initiative, including consideration of the potential for hedging and managing labour costs through internal efficiency improvements.

This section sets out Ausgrid's methodology to estimating cost escalation and their application in forecasts. It covers:

- the context to our approach, taking account of the AER's draft guideline on expenditure assessment and issues raised in consultation
- the impact of cost escalations on Ausgrid's proposed program of capital expenditure
- the cost escalators used to estimate the impact and the rationale for the approach
- how these escalators have been applied to the cost forecasts.

While initial cost escalation values are presented, input data and cost escalators will be updated prior to the final submission.

1.1 An approach based on the NER and relevant debate on escalations

Following recent changes to the NER and as part of the AER's Better Regulation program there has been consultation on approaches to setting and reviewing expenditure forecasts. With less prescription now provided by the NER, the AER is developing guidelines to detail its approach to making determinations.

One such guideline is the Expenditure Forecast Assessment Guideline. The guideline states that DNSPs need to provide the AER with (amongst other things) '…methods of calculating, and calculations of any allowances for real cost escalation'

Earlier in the consultation, the AER questioned the efficiency of expending significant resources on forecasting input price movements as the impact on expenditure allowances was typically around three to five per cent. It suggested that NSPs consider using alternative ways of managing price increases, such as:

- Hedging contracts
- Productivity dividends in wage negotiations
- Timing of input purchases.

In ensuring its forecasts reflect efficient costs, Ausgrid is applying various approaches to mitigating real cost increases. Ausgrid agrees that seeking productivity dividends in wage negotiations is an appropriate approach to containing internal labour costs and this has been reflected in our proposed capital expenditure program. It has also implemented procurement savings strategies to manage cost increases for goods and services other than labour.

In relation to material costs, Ausgrid's analysis suggests that hedging or timing input purchases are either not practical or efficient mechanisms, under our circumstances and the current market conditions, and that these approaches would lead to increased costs. For example, in the case of hedging copper for a five year regulatory period, the hedging contracts would be based on the future copper price – the same price used to forecast cost escalation. The NSP would also incur transaction costs in trading the futures market for copper - across a number of commodities collective transaction costs are unlikely to be the most efficient option, especially in light of associated hedge accounting complexities. The timing of input purchases is largely driven by project management considerations. Attempting to time equipment purchase to achieve cost savings is likely to result in significant additional costs due to project delays without any guarantee of a better cost outcome.

It appears that the AER's overarching concern in its issues paper is that, unless significantly lower costs can be achieved, a practical and simple method in estimating real cost escalation is most appropriate. Ausgrid agrees with this view and believes that the proposed approach is in line with the AER's views.

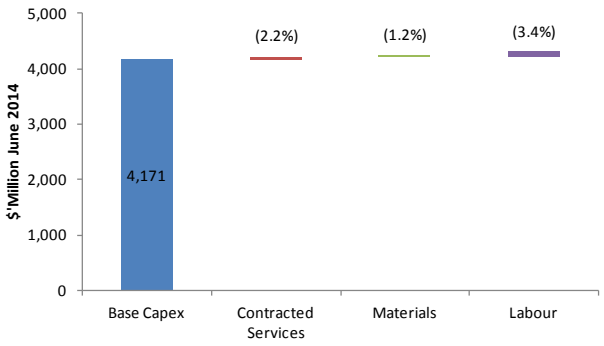
1.2 Summary of cost escalation impact

Analysis indicates that Ausgrid's capital expenditure program will be impacted to some extent by increases in the real cost of labour, materials and contractor services through 2019. If not mitigated, these costs increases are forecast to contribute an additional $127.2m (6.8%) to the cost of the total capital program.

Figure 1 shows the component impacts of real cost increases which comprise;

- Labour cost escalation $80.1M
- Contracted Services $42.8M
- Materials $4.3M

Figure 1: Impact of input cost escalation on total capital expenditure (real $2014)



Further detail on the overall approach to managing cost increases, cost escalation factors used, forecasting methods and the proposed approach to their treatment follow.

1.2.1 Overview of cost escalations – their description, drivers and impact

This subsection provides an overview of the drivers for cost escalation.

Real cost increases in labour, materials and contractor services include various cost components that are driven by a combination of underlying factors. Table 1 describes these components, their drivers and the provisional estimated impacts of each on the program. The program forecast will be updated prior to the final determination or submission.

Table 1: Overview of input cost escalators and estimated cost increase from 2015 to 2019

Cost escalation & unmitigated impact	Input costs components used in cost escalation estimation
Labour **Forecast $80.1 million increase**	**Cost components:** Ausgrid's internal capitalised labour. **Cost drivers:** Wage growth in the utilities sector is expected to be strong as there is continuing demand for the sector's workers in the mining industry, which is entering into a production phase.[1] The forecast uses actual increases as per the latest Enterprise Bargaining Agreement. After December 2014 a forecast of wages in the NSW utilities sector is applied. This is based on work by the Competition Economists Group and Independent Economics.

[1] Independent Economics, '*Labour cost escalators for NSW, the ACT and Tasmania*', February 2014, p. vi.

Cost escalation & unmitigated impact	Input costs components used in cost escalation estimation
Contracted services **Forecast $42.8M increase**	**Cost components:** This is the cost of contractors who provide services related to the building new sub-transmission and zone substations; installing mains and providing IT and other professional services. **Cost drivers:** For the purposes of escalation, contracted services is assumed to have three sub-categories: general labour; civil engineering work; and professional services. The cost drivers for these three sub-categories are: • Contracted Labour Services: general labour for which the Independent Economics' forecast of the Wage Price Index in the general NSW economy is applied. As the NSW labour market forecast tightens, wage growth is expected to be higher than in recent years.[2] • Civil engineering: Specialist large-scale civil engineering work costs are reflected in the Australian Construction Industry Forum's forecast of non-residential construction costs. There is expected to be a small positive increase in costs due to larger project activity (eg Barangaroo) relative to recent years.[3]
Materials **Forecast $4.3M increase**	**Cost components:** This includes costs of the physical equipment and assets installed on the network as well as the land on which assets are built. Assets such as transformers, switchgear and cables include aluminium, copper, steel and oil derived components. **Cost drivers:** Being globally traded commodities, many factors affect commodity prices (not just 'real' supply and demand – recent years have seen more speculation in these markets also). Commodity markets can therefore be volatile and values of aluminium, cooper, steel and oil fluctuate daily. Ausgrid is using a CEG analysis of these costs[4], based on futures market prices and/or expert forecasts of these. Materials escalation was based on the materials escalators contained in the draft July report. The cost of land, particularly in Sydney CBD and major urban areas, is expected to increase due to demand for commercial property & development sites.

Ausgrid has concluded on the basis of advice that the increase from material cost increases cannot be efficiently mitigated via hedging or alternate procurement arrangements and proposes that it be reflected in the forecast.

Ausgrid's approach to estimating these cost escalators is discussed in the following subsection.

1.2.2 Methodology to deriving cost escalators

This subsection briefly sets out the methods of calculating, and calculations of any allowances for real cost escalation.

Ideally, cost escalation impacts would best be understood by examining forecasts of actual prices for items purchased. While this is generally possible for labour, neither item cost forecasts nor futures markets exist for other goods and services that Ausgrid procures. The 'next best' approach applied in these cases is one the AER has accepted in the past – where forecast underlying commodity costs are applied to item costs in line with the proportion of the item costs they reflect.

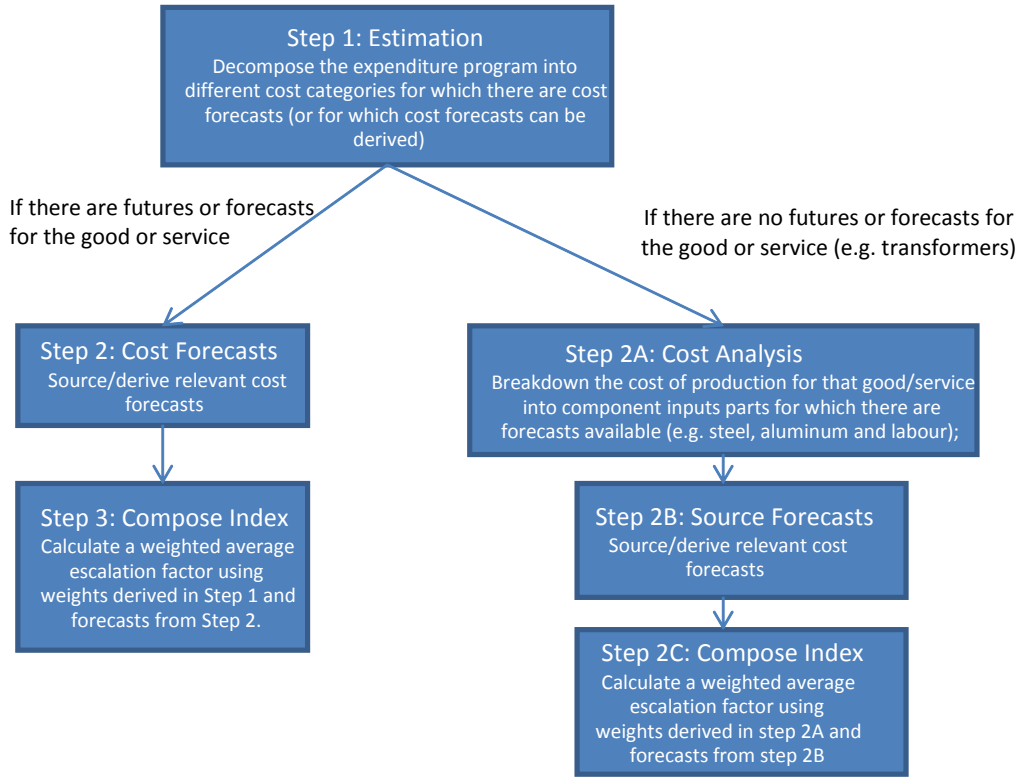
The current approach is informed by cost escalators compiled by the Competition Economists Group (CEG) on behalf of Ausgrid, Endeavour Energy, Essential Energy, ActewAGL and Transend in August 2013. The CEG report uses a labour

[2] Independent Economics, '*Labour cost escalators for NSW, the ACT and Tasmania*', February 2014, p. v.
[3] Australian Construction Industry Forum, '*ACIF Forecasts for Non-Residential Building*', May 2013, see http://www.acif.com.au/forecasts/summary/highlights-for-non-residential-building Accessed 8 November 2013.
[4] CEG, Escalation factors affecting expenditure forecasts, Draft & Final Reports July/Dec 2013

cost forecast from Independent Economics prepared for Ausgrid in August 2013. The CEG and Independent Economics reports are separately provided. BIS Shrapnel forecasts of land prices were also used.

Ausgrid is applying these expert forecasts in line with approaches previously accepted by the AER in its determinations for electricity and gas businesses.[5] It is summarised below where **Steps 1 to 3** relate to labour escalation and **steps 1, 2A to 2C** relate contract services and materials.

Figure 1: AER accepted cost escalation estimation methodology



Source: CEG, Escalation factors affecting expenditure forecasts, Final report, July 2013, p. 4.

Ausgrid considered an alternative approach to steps 2A to 2C - to extrapolate historical producer price indexes of electrical equipment provided by the Australian Bureau of Statistics. This is considered to be less accurate as categories available include unrelated equipment types.[6] As the AER has accepted the approach of using cost escalators based on input prices in past determinations, Ausgrid has applied this approach.

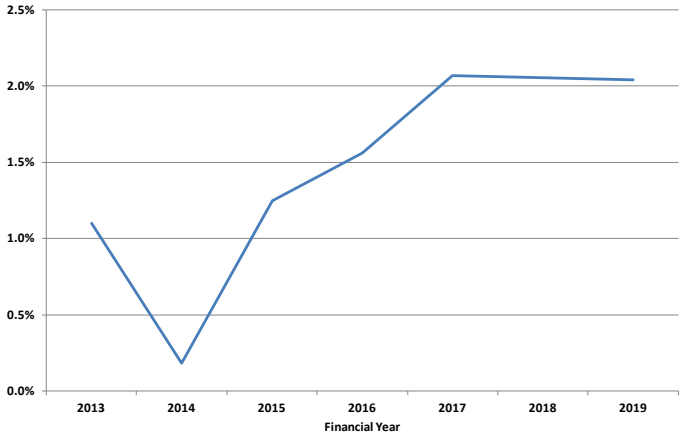
[5] These CEG reports were for Electranet, NSW and Tasmanian electricity distribution and transmissions businesses, Western Power and Jemena Gas Networks.

[6] For example, even at the most granular levels of the Australia and New Zealand Standard Industry Classification system (eg ANSIC 2431 Electric cable and wire manufacturing), the categories would include a number of electrical products that may not be relevant to the NSPs.

1.2.3 Labour cost escalation – approach and application

Labour costs are forecast to rise. Figure 3 shows Independent Economics' forecast where wages are expected to rise (in real terms) by between 0.2 and 2.1 per cent per annum over the five year regulatory period.

Figure 2: Historical and forecast annual growth in real NSW utility wages



Source: CEG, '*Escalation factors Ausgrid 20 Dec 2013.xlsx*', Independent Economics – NSW forecast (Wage Price Index for utilities); CEG, Escalation factors affecting expenditure forecasts, December 2013, Table 2 (Wage Price Index for utilities).

This equates to an estimated $80.1 million (June 2014 $) real impact on the capital expenditure budget.

1.3 Contracted Services cost escalation – approach and application

It is more complex to mitigate contract services and materials' costs and our approach is described below.

1.3.1 Description of cost category

This category contains costs associated with contractors providing services to the capital expenditure program including construction, IT and professional services. For escalation purposes there are three sub-categories: general labour; non-residential construction; and professional services. These are briefly described below:

- Contracted Labour Services – this category includes contractors for installing (or assisting with installing) underground sub-transmission mains; distribution substations and mains; and undertaking communications or systems IT work. Major activities include contract cable laying, traffic management and general labouring services. This accounts for about two-thirds[7] of the proposed capital expenditure program.
- Non-residential construction – this category includes capital expenditure for contractors to build sub-transmission substations and zone substations. This accounts for about 18 per cent[7] of the proposed capital expenditure program.
- Professional services – this category includes capital expenditure on contractors working on non-system, IT requirements in the areas of software, hardware and IT facilities management. This accounts for about 16 per cent7 of the proposed capital expenditure program.

1.3.2 Drivers of change in real costs

The key reasons contractor service costs are expected to increase in the regulatory period are:

- Contracted Labour Services – Independent Economics' forecast is that activity will increase from 2014-15 onwards as economic growth and inflation return to their (higher) long term averages. The NSW labour market will likely tighten and wage growth will be higher than in recent years.[7]

[7] See Cost Impact Assessment 201419.xlsx

- Non-residential construction – ACIL Allen Consulting's forecast shows a small but positive change in the real cost of non-residential construction. However projects like the Barangaroo expansion and the 2018 Commonwealth Games will have an impact on non-residential construction prices in the period to 2018-19.[8]

- Professional services – Wages in the professional services industry are linked to business investment, which has slowed with mining investment in recent times. However Independent Economics expects investment in the non-mining sector to pick up, increasing activity in the professional services sector. Sectors wages are forecast to grow in line with the national average.[9]

1.3.3 Approach to forecasting escalation

Across these three contractor types there are distinct cost drivers and Ausgrid uses three different cost escalators, provided by CEG. They are:

- Labour – CEG uses Independent Economics' forecast of nominal wages in the New South Wales' economy.[9] As noted by Independent Economics, it is the AER's preference to use the wage price index measure for wages and this is the measure used here. CEG converts the nominal forecast into real using a method set out in its paper – see Appendix A. In the case of contracted services (other than civil construction), Ausgrid weights CEG's general labour escalator by 90 per cent to account for other un-escalated ancillary costs. Ausgrid makes this change to the CEG escalator with the intention of better reflecting the composition of the contractor service cost for general labour. For this reason, it is labelled as 'general labour – modified version' below.

- Non-residential construction – CEG uses ACIL Allen Consulting's forecast for the non-residential construction sector as published by the Australian Construction Industry Forum. This measure is the non-residential price index.

- Professional services – CEG uses Independent Economics' forecast of New South Wales' wages in the professional services industry. As noted by the Independent Economics, it is the AER's preference to use the wage price index (WPI) measure for wages and this is the measure used here.

1.3.4 Proposed real cost escalation rates

Table 2 shows the input, source and value for real cost escalation for the three subcategories. These rates are provisional and it is proposed that these will be updated on the basis of latest available data prior to the final submission.

Table 2: Escalation factors for contractor services costs (real percentage change)

Input	Source	2014	2015	2016	2017	2018	2019
Contracted Labour Services (modified version)*	CEG analysis of Independent Economics' WPI forecast for the NSW economy.*	1.1%	0.6%	1.1%	1.7%	1.8%	1.8%
Non-residential construction	CEG analysis of Australian Construction Council non-residential construction forecast	0.4%	0.4%	0.4%	0.4%	0.1%	0.4%
Professional services	CEG analysis of Independent Economics' WPI forecast for the NSW professional services industry	1.0%	0.8%	1.3%	1.8%	1.9%	1.9%

Note: * In applying the CEG cost escalator for general labour to contractor services costs that comprise unskilled/labourer type skills, Ausgrid weights the general labour escalator by 90% to account for other costs, such as supervisorial oversight. These other costs have a zero cost escalation. This is to better reflect the composition of the cost.

1.4 Application of real cost escalators

To accurately estimate the impact of cost changes, escalators (from Table 2) are applied based on type of activity in that asset category. Table 3 shows the result of this. Each asset category is aligned to one of the three cost escalators – non-residential construction, General labour services or professional services.

[8] Australian Construction Industry Forum, '*ACIF Forecasts for Non-Residential Building*', May 2013, see http://www.acif.com.au/forecasts/summary/highlights-for-non-residential-building Accessed 8 November 2013. (these numbers have been updated in the latest version of the CEG Report)

[9] Independent Economics, 'Labour cost escalators for NSW, the ACT and Tasmania', December 2013, p. 5.

Table 3: Mapping of contractor service cost asset categories to input costs

Asset category	Description of activity and escalator applied
Sub-Transmission and Zone Sub-Stations	This activity involves designing and building complex structures. Cost escalator applied: **Non-residential construction**
Distribution Substations	This activity involves services required to facilitate the installation of distribution substations (minor civil works, reinstatement and traffic management. Cost escalator applied: **General labour services**
Sub-Transmission Overhead	These activities involve installing power lines and require less specialist input. Cost escalator applied: **General labour services**
Sub-Transmission Underground	
11kV Overhead	
11kV Underground	
Communication Cable	These activities involve the installation of communication cables and equipment and do not require specialist labour. Cost escalator applied: **General labour services**
Communication Equipment	
Metering	This activity involves the installation of meters and does not require specialist labour. Cost escalator applied: **General labour services**
Street Lighting	This activity does not require specialist labour. Cost escalator applied: **General labour services**
Other	There are a range of other activities performed by contractors, such as traffic management, that are of a more general labour skill. Cost escalator applied: **General labour services**
Non-System: IT Software	These activities involve IT technicians with specialist skills. Cost escalator applied: **Professional services**
Non-System: IT Hardware	
Non-System: IT Facilities Management	

The table 4 shows the resulting cost escalation applied to each asset category. These rates are provisional and will be updated prior to the final submission.

This is a full list of all asset categories and as the asset categories for land are not affected by contractor services, there is no real cost escalator applicable to these categories.

The application of these cost escalators results in an estimated real increase in capital expenditure costs of $67.5 million.

1.4.1 Materials cost escalation – approach and application

Real materials cost increases are expected to increase costs by $4.3 million (June 2014 $).

This cost category includes costs of the physical equipment and assets installed on the network as well as the land on which assets are built. Assets such as transformers, switchgear and cables include aluminium, copper, steel and oil derived components.

The AER's Expenditure Forecast Assessment Guideline states 'DNSPs must demonstrate the proposed approach they chose to forecast materials cost changes reasonably reflected the change in prices they paid for materials in the past such that we can determine whether DNSPs' forecasts are reliable'[10]. In Ausgrid's case, contracts with equipment suppliers contain price adjustment formulae that allow equipment prices to change as material prices change. Details of these contracts have been supplied separately as part of the RIN. Looking forward, materials supply contracts are largely unchanged so equipment price changes will trend with input price movements consistent with the recent past.

1.4.2 Drivers of change in real costs

In the case of aluminium, copper, steel and crude oil, the commodities' value are volatile. Figure 4 illustrates this where, in the case in copper, in the last five years; the price has changed from $5,545 in July 2005 to $10,137 in February 2011. Being globally traded commodities, the volatility is driven by a number of factors including financial speculation.

Figure 3: Copper price on the London Metals Exchange, July 2005 – March 2013

- ***Source: CEG,* 'Escalation Factors Ausgrid 20 Dec 2013.xlsm', *London Metals Exchange, Monthly, Real AUD.***

[10] AER, '*Better Regulation: Expenditure Forecast Assessment Guideline for Electricity Distribution*', November 2013, p. 10.

In the case of land, property prices are a function of demand for commercial and industrial sites and vary between CBD, suburban and industrial categories. These forecasts have been obtained by BIS Shrapnel.[11]

1.4.3 Approach to forecasting escalation

Figure 2 shown earlier summarises the approach. Ideally, cost escalation impacts would best be understood by examining forecasts of actual prices for items purchased. While this is generally possible for land, forecast equipment costs are instead estimated using the inputs that comprise the product – such as copper or aluminium for goods (Steps 2A to 2C in Figure 2). For Step 2A (Breakdown of Materials), Ausgrid identified the inputs into the equipment we will use in our capital expenditure program on the basis of price adjustment formulae in period contracts (where available). These commodities include aluminium, copper, oil and steel.

For Step 2B (Forecasting Process), CEG derives indices of cost escalators for these inputs. In undertaking Step 2B, CEG uses future prices, where they are available and where the market for the futures is sufficiently liquid. CEG prefers that approach to using expert forecasts.

In the case of crude oil, the approach taken by CEG is slightly different. CEG notes the AER prefers zero real escalation for crude oil in US$ terms. As the Australian dollar is expected to deteriorate against the US dollar over the long term, this means there will be a real increase in the cost of crude oil.[12] The results of Step 2B are shown below in Table 5. It should be noted that this approach results in a higher forecast that than the Consensus Economics approach or the approach based on CME (Bloomberg).

For Step 2C (Compose index), as Ausgrid's costs are forecast by numbers of products used (like transformers), the indices derived by Step 2B have to be applied proportionally. Equipment like transformers are 'mapped' to various commodities (for example, a transformer has 10 per cent copper). The decomposition is based on the contracts Ausgrid has with its equipment suppliers – price adjustment formulae within these contracts indicate how much of a particular type of equipment is comprised of aluminium for example. A summary of this is set out in Table 7 below. The various types of equipment are then mapped to asset classes such as 'distribution substations'. Then a 'weighted' index is created for each asset class. This index is then applied to the forecast costs of that asset class in constant terms to forecast the costs in real terms.

1.4.4 Projected real cost escalation rates

Projected real cost escalation rates for materials cost drivers as forecast by CEG and BIS Shrapnel are summarised in Table 5. These rates are provisional and are based on the draft July forecasts. It is proposed that these will be updated with the latest available data prior to the final submission.

Table 4: Escalation factors for materials costs (real percentage change)

Input	Source	2014	2015	2016	2017	2018	2019
Aluminium	CEG analysis of London Metals Exchange futures and Consensus Economics forecasts	-1.1%	7.2%	2.9%	5.0%	4.6%	4.1%
Copper	CEG analysis of London Metals Exchange futures and Consensus Economics forecasts	-4.0%	3.1%	-1.4%	-1.0%	-1.3%	-1.6%
Crude oil (constant real US prices)	CEG analysis of US Department of Energy historical data and Chicago Mercantile Exchange futures	5.4%	4.1%	0.6%	2.4%	2.3%	2.0%
Steel (fabricated)	CEG analysis of Consensus Economics forecasts	-4.2%	12.0%	-0.4%	-1.2%	-1.5%	-1.8%

[11] BIS Shrapnel, Sydney commercial property prospects update 2011-2021
BIS Shrapnel, Sydney suburban centres and office parks update 2011-2021
BIS Shrapnel, Sydney industrial property: market forecasts and strategies 2011-2021

[12] CEG, Escalation factors affecting expenditure forecasts, Draft Report July 2013, p. 26.

Input	Source	2014	2015	2016	2017	2018	2019
Land (commercial)	Average of BIS Shrapnel's Sydney CBD Prime value index and Sydney CBD B grade value index[13]	12.0%	6.3%	18.3%	4.0%	-1.8%	-16.8%
Land (industrial)	Average of BIS Shrapnel's Sydney Industrial property indices for Northern (high tech); Northern prime; Southern prime; and Southern secondary[14]	4.2%	4.1%	5.2%	3.5%	-1.6%	-9.8%

1.4.5 Application of real cost escalators

The cost escalators for land are applied at an asset category level and while materials escalation is applied at an asset type level. Table 6 summarises which cost escalators are applied to which asset class and why.

Table 5: Mapping of land material cost asset categories to input costs

Asset category	Description of activity and escalator applied
Land - Rural	This category includes land in rural areas. As this type of land is less densely populated and least relevant to the CBD cost escalator, the cost escalator applied is **Land (industrial)**
Land - Suburban	This category includes land in suburban areas. The cost escalator for industrial land is closest to this type of land. Thus the cost escalator applied is **Land (industrial)**
Land - Industrial	This category is for industrial land. The cost escalator applied is **Land (industrial)**
Land CBD	This category is for land in the built up Sydney Central Business District area. The cost escalator applied is **Land (commercial)**

Table 7 sets out a simplified summary of the proportional allocation of costs to each asset type. An adjusted cost escalator is derived for each type of equipment. The result is a weighted material cost escalator by asset class. This is shown below in Table 8.

Table 6: Summary of proportional allocation of input costs to distribution equipment (per cent)

Distribution equipment	Aluminium	Copper	Oil	Steel	Other
Transformers		10.0	3.5	14.0	72.5
Distribution transformers	15.0	2.0	6.0	20.0	57.0
Switchgear		12.5		13.9	73.6
Distribution substations	3.0	10.0	2.0	28.0	57.0
Copper cable		55.0			45.0
Aluminium cable	20.0	19.0			61.0
Steel poles				76.0	24.0
Street lighting					100.0

[13] BIS Shrapnel, Sydney commercial property prospects update 2011-2021, p. 30-31
[14] BIS Shrapnel, Sydney commercial property prospects update 2011-2021, p. 48-50.

Table 8 shows the resulting cost escalation by asset category. These rates are provisional and will be updated on the basis of latest available data prior to the final submission.

Table 7: Materials cost escalation by asset category (real percentage change)

Asset category	2014	2015	2016	2017	2018	2019
Sub-Transmission & Zone Sub-Stations	-1.0%	2.0%	-0.2%	-0.3%	-0.3%	-0.4%
Distribution Substations	-1.5%	4.0%	-0.1%	-0.3%	-0.4%	-0.5%
Sub-Transmission Overhead	-0.3%	0.7%	0.1%	0.3%	0.2%	0.2%
Sub-Transmission Underground	-1.3%	1.0%	-0.4%	-0.3%	-0.4%	-0.5%
11kV Overhead	-0.9%	2.3%	0.1%	0.2%	0.1%	-0.0%
11kV Underground	-0.73%	1.52%	0.24%	0.61%	0.51%	0.39%
Land - Rural	4.2%	4.1%	5.2%	3.5%	-1.6%	-9.8%
Land – Suburban & Industrial	4.2%	4.1%	5.2%	3.5%	-1.6%	-9.8%
Land CBD	12.0%	6.3%	18.3%	4.0%	-1.8%	-16.8%
Communication Cable	-	-	-	-	-	-
Communication Equip	-	-	-	-	-	-
Metering	-	-	-	-	-	-
Street Lighting	-	-	-	-	-	-
Other	-	-	-	-	-	-
Non-System: IT Software	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Non-System: IT Hardware	-0.5%	-0.5%	-0.5%	-0.5%	-0.5%	-0.5%
Non-System: IT Facilities Management	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

The application of these to the capital creates a real cost increase of $5.2 million - minor relative to the overall program. However, the volatility of actual commodity prices and the rise and fall clauses of Ausgrid's supply contracts can lead to financing issues when these costs increase substantially in one period, even if they might decrease later.

1.5 Summary

This section has set out a methodology to estimating cost escalation and it is intended that input data and cost escalators will be updated just prior to the final determination or submission. On current forecasts there will be an impact from increases in real cost and Ausgrid is seeking to recover some components of that. Ausgrid agrees with the prudent approach suggested by the AER in managing internal labour cost increases with productivity improvements. This will avoid an increase in capitalised labour costs of $80.1 million (June 2014 $). Other cost increases that Ausgrid cannot mitigate efficiently are for materials and contractor services. It is estimated by CEG's forecasts that this will increase capital costs by $42.8 million and $4.3M (June 2014 $) respectively. Ausgrid is seeking to recover this smaller amount, which accounts for only 1.6 per cent of the total capital expenditure program.

Ausgrid has applied an approach that is simple, transparent, logical and in keeping with approaches accepted by the AER in recent determinations.

Supporting reference to 5.16

Consolidated CAPEX Report

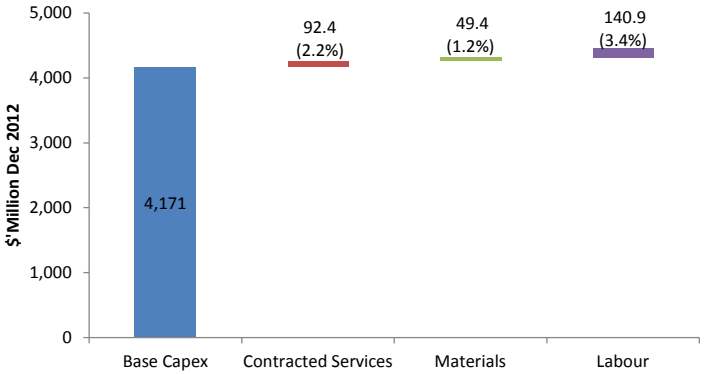
Real

BPC Cost Type	2015	2016	2017	2018	2019	Overall Result	
Contracted Services (Total)	333,112	337,946	287,481	249,639	213,703	1,421,882	32%
Contracted Services	309,182	267,863	199,488	157,903	119,099	1,053,534	
Contracted Services (Input)	23,931	70,083	87,994	91,737	94,605	368,348	
Labour	375,461	371,376	343,858	342,876	338,793	1,772,363	
Materials	311,181	283,670	232,824	227,271	204,652	1,259,597	
Overall Result	1,019,753	992,992	864,163	819,786	757,148	4,453,842	
	5.1%	6.6%	8.5%	10.8%	13.0%		
Constant							
BPC Cost Type	2015	2016	2017	2018	2019	Overall Result	
Contracted Services (Total)	316,946	319,289	268,658	230,446	194,158	1,329,497	
Contracted Services	294,179	253,096	186,554	146,147	108,597	988,573	
Contracted Services (Input)	22,767	66,194	82,103	84,299	85,561	340,925	
Labour	357,085	348,313	316,816	309,499	299,733	1,631,447	
Materials	301,543	272,430	223,429	217,069	195,737	1,210,209	
Overall Result	975,574	940,033	808,904	757,014	689,628	4,171,153	

Difference (ammount)								
BPC Cost Type	2015	2016	2017	2018	2019	Overall Result		
Contracted Services (Total)	16,166	18,657	18,823	19,194	19,545	92,385	2.2%	6.9%
Contracted Services	15,003	14,768	12,933	11,756	10,502	64,961	1.6%	6.6%
Contracted Services (Input)	1,163	3,889	5,890	7,438	9,043	27,424	0.7%	8.0%
Labour	18,375	23,063	27,042	33,376	39,060	140,917	3.4%	8.6%
Materials	9,638	11,239	9,394	10,201	8,915	49,387	1.2%	4.1%
Overall Result	44,179	52,959	55,259	62,771	67,520	282,689	6.8%	6.8%

Difference (percentage)							
BPC Cost Type	2015	2016	2017	2018	2019	Overall Result	Average
Contracted Services (Total)	5.1%	5.8%	7.0%	8.3%	10.1%	6.9%	1.4%
Contracted Services	5.1%	5.8%	6.9%	8.0%	9.7%	6.6%	1.3%
Contracted Services (Input)	5.1%	5.9%	7.2%	8.8%	10.6%	8.0%	1.6%
Labour	5.1%	6.6%	8.5%	10.8%	13.0%	8.6%	1.7%
Materials	3.2%	4.1%	4.2%	4.7%	4.6%	4.1%	0.8%
Overall Result	4.5%	5.6%	6.8%	8.3%	9.8%	6.8%	1.3%

	1000				
Base Capex	4,171				
Contracted Se	4,171	92.4			2.2%
Materials	4,171	92.4	49.4		1.2%
Labour	4,171	92.4	49.4	140.9	3.4%
					6.8%



Consolidated CAPEX Report			
			Total CAPEX
		BPC Cost Type	Contracted Services
BPC Project	BPC Asset Cat		* 1,000
Total CAPEX	AS_TOT	Total Asset Category	988,573
Total CAPEX	AS01_0000	Total Sub-transmission Substation	65,835
Total CAPEX	AS02_0000	Total Zone Substation	196,169
Total CAPEX	AS03_0000	Total Sub-transmission Mains OH	39,139
Total CAPEX	AS04_0000	Total Sub-transmission Mains UG	307,018
Total CAPEX	AS05_0000	Total Distribution Substation	87,370
Total CAPEX	AS08_0000	Total Distribution Mains	84,045
Total CAPEX	AS11_0000	Communications / System IT	19,941
Total CAPEX	AS20_0000	Total Non-System	182,387
Total CAPEX	AS99_0000	Total Other	6,391
Total CAPEX	AS_LAND	Total Land	277
Total Area Plans	AS_TOT	Total Asset Category	589,965
Total Area Plans	AS01_0000	Total Sub-transmission Substation	34,077
Total Area Plans	AS02_0000	Total Zone Substation	144,099
Total Area Plans	AS03_0000	Total Sub-transmission Mains OH	2,092
Total Area Plans	AS04_0000	Total Sub-transmission Mains UG	300,599
Total Area Plans	AS05_0000	Total Distribution Substation	200
Total Area Plans	AS08_0000	Total Distribution Mains	100,139
Total Area Plans	AS11_0000	Communications / System IT	8,758
Total Strategic Property Plan	AS_TOT	Total Asset Category	277
Total Strategic Property Plan	AS01_0000	Total Sub-transmission Substation	
Total Strategic Property Plan	AS02_0000	Total Zone Substation	
Total Strategic Property Plan	AS03_0000	Total Sub-transmission Mains OH	
Total Strategic Property Plan	AS04_0000	Total Sub-transmission Mains UG	
Total Strategic Property Plan	AS_LAND	Total Land	277
Total Replacement Plans	AS_TOT	Total Asset Category	249,806
Total Replacement Plans	AS01_0000	Total Sub-transmission Substation	18,340
Total Replacement Plans	AS02_0000	Total Zone Substation	24,213
Total Replacement Plans	AS03_0000	Total Sub-transmission Mains OH	36,088
Total Replacement Plans	AS04_0000	Total Sub-transmission Mains UG	6,053
Total Replacement Plans	AS05_0000	Total Distribution Substation	26,872
Total Replacement Plans	AS08_0000	Total Distribution Mains	138,240
Total Duty of Care Plan	AS_TOT	Total Asset Category	101,471
Total Duty of Care Plan	AS01_0000	Total Sub-transmission Substation	13,418
Total Duty of Care Plan	AS02_0000	Total Zone Substation	23,057
Total Duty of Care Plan	AS03_0000	Total Sub-transmission Mains OH	959
Total Duty of Care Plan	AS04_0000	Total Sub-transmission Mains UG	366
Total Duty of Care Plan	AS05_0000	Total Distribution Substation	56,328
Total Duty of Care Plan	AS08_0000	Total Distribution Mains	7,343
Total 11kV Capacity Plan	AS_TOT	Total Asset Category	-170,036
Total 11kV Capacity Plan	AS08_0000	Total Distribution Mains	-170,036
Total Reliability Plan	AS_TOT	Total Asset Category	
Total Reliability Plan	AS08_0000	Total Distribution Mains	
Total Customer Connections Plan	AS_TOT	Total Asset Category	7,712
Total Customer Connections Plan	AS05_0000	Total Distribution Substation	1,307

Total Customer Connections Plan	AS08_0000	Total Distribution Mains	14
Total Customer Connections Plan	AS99_0000	Total Other	6,391
Total Low Voltage Plan	AS_TOT	Total Asset Category	11,007
Total Low Voltage Plan	AS05_0000	Total Distribution Substation	2,664
Total Low Voltage Plan	AS08_0000	Total Distribution Mains	8,343
Total System IT / OTI Plan	AS_TOT	Total Asset Category	15,983
Total System IT / OTI Plan	AS01_0000	Total Sub-transmission Substation	
Total System IT / OTI Plan	AS02_0000	Total Zone Substation	4,800
Total System IT / OTI Plan	AS03_0000	Total Sub-transmission Mains OH	
Total System IT / OTI Plan	AS04_0000	Total Sub-transmission Mains UG	
Total System IT / OTI Plan	AS08_0000	Total Distribution Mains	
Total System IT / OTI Plan	AS11_0000	Communications / System IT	11,183
Total Non-System	AS_TOT	Total Asset Category	182,387
Total Non-System	AS20_0000	Total Non-System	182,387

Total CAPEX	Total CAPEX	Total CAPEX	Total CAPEX
Contracted Services (Input)	Labour	Materials	Overall Result
* 1,000	* 1,000	* 1,000	* 1,000
340,925	1,631,447	1,210,209	4,171,153
	116,155	89,929	271,919
	392,688	338,456	927,312
	64,379	28,197	131,716
	92,082	124,290	523,390
10,306	232,371	247,009	577,057
330,618	625,834	198,456	1,238,954
	34,066	20,722	74,728
	68,841	119,555	370,784
	4,903		11,294
	128	43,595	44,000
	417,635	438,961	1,446,560
	38,503	37,158	109,739
	265,216	252,802	662,118
	8,142	3,989	14,222
	74,369	115,481	490,449
			200
	28,918	28,645	157,702
	2,487	885	12,130
	444	43,595	44,316
	28		28
	123		123
	13		13
	152		152
	128	43,595	44,000
	744,419	337,199	1,331,424
	63,837	39,032	121,209
	98,986	54,599	177,798
	49,565	20,807	106,460
	16,787	8,306	31,146
	112,165	107,374	246,412
	403,078	107,081	648,399
	112,434	110,584	324,489
	13,698	13,709	40,826
	27,432	30,344	80,833
	6,621	3,389	10,969
	366	367	1,100
	46,129	44,566	147,023
	18,187	18,209	43,740
282,088	57,378	18,597	188,027
282,088	57,378	18,597	188,027
5,183	14,723	6,471	26,377
5,183	14,723	6,471	26,377
25,319	74,593	82,660	190,284
7,356	46,943	76,756	132,361

17,963	22,748	5,904	46,629
	4,903		11,294
28,336	107,830	31,827	179,000
2,951	27,134	18,314	51,062
25,385	80,696	13,513	127,937
	33,150	20,760	69,893
	87	29	117
	930	710	6,440
	39	13	52
	408	136	544
	107	36	142
	31,579	19,836	62,598
	68,841	119,555	370,784
	68,841	119,555	370,784