COMPETITION ECONOMISTS GROUP

Labour Escalation factors affecting expenditure forecasts

December 2017

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1 Introduction

1. CEG has been commissioned by Essential Energy to estimate cost escalation factors for labour in order to assist it in forecasting future operating and capital expenditure based on changes in unit costs.

2. Escalation factors, properly derived, can be used to project forward the value of base objects into the future. An example of a base object may be the average wages of a full time employee in the electricity, gas, water and waste sectors (utilities industry) over the 2016-17 financial year.

3. Planning of future projects may be conducted on the basis that a certain number of such employees may be required over a period of time during the next regulatory period. Escalation factors for utilities industry wages can be used to determine the expected cost of these labour inputs to this project. Alternatively, a high level approach may be taken where labour is assumed to be a fixed proportion of operating expenditure (opex). Opex can then be forecast forward on the assumption that the non-labour inputs to opex maintain a constant real value while the labour proportion of real opex grows at a specific rate (noting that this will imply a change in that proportion from year to year).

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:

   - the forecast change in average prices between financial years (which we call 'financial year' escalators); and
   - the forecast change in average prices between each calendar year (which we call 'calendar year' escalators).

5. Essential has estimated over a particular period the base price of the units that it seeks to escalate. This is important to escalation because escalation factors must consistently commence escalation of prices from the correct base period.

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

   - Section 2 sets out the basis of the methodology that is proposed by CEG to estimate cost escalation factors;
   - Section 3 describes our calculation of labour cost escalation factors; and
   - Section 4 describes our calculation of materials cost escalation factors.

2 Description of methodology

7. In order to escalate forward Essential's operating and capital expenditure it is necessary to obtain or develop forecasts of either:

   a. the price of goods and services directly purchased by Essential; or

   b. the price of inputs used in the production of goods and services directly purchased by Essential for the purpose of delivering their expenditure programs.

8. This task would best be achieved by examining forecasts of prices for all inputs purchased by Essential (i.e. category a) above). However, with the exception of labour costs, bespoke forecasts for individual items (e.g. transformers, copper cable, switch gear) are difficult to procure. For example, while there are forecasts for labour costs in the general utilities sector (i.e., for electricity, gas, water and wastewater) there are few, if any, forecasts of the cost of equipment purchased by Essential.

9. The lack of such forecasts for most goods and services purchased by Essential reflects the specialised and heterogeneous nature of these goods and services – such that there is insufficient demand for forecasts of these prices and no active trading in 'futures' for these goods and services. For example, there is no formal 'futures market' for transformers.

10. Consistent with this, the AER's standard practice in recent regulatory determinations has been to assume zero real escalation for non-labour inputs. We have been instructed to adopt this practice in this report.

2.1 Source of real wage forecasts

11. It is our understanding that the escalation factors that are to be applied to both operating and capital expenditure must escalate the real price of the underlying labour input and not the nominal price.

12. For wage costs, we have relied on real wage forecasts from Deloitte Access Economics forecasts from February 2017[1].

2.2 Timing of escalation factors

13. Issues of timing are critical to determining escalators that can consistently be applied for this purpose. An escalator provides an estimate for the increase in price for an input from one period to another. For consistency it is important that the escalation factors that are applied to the base planning objects are:

[1] Deloitte Access Economics forecasts are available up to the 2022-23 financial year. Forecasts beyond the 2022-23 financial year are obtained through a 5 year trailing average approach.

i. derived in a way that is consistent with the base period in which these costs have been measured;

ii. derived in a way that is consistent with their intended use in forecasting future costs in specific periods; and

iii. avoid overlapping periods or 'gaps' such that escalation is either not properly accounted for or is double counted.

14. It is our understanding that escalation factors are used for the purpose of forecasting expenditure programs based on changes in unit costs, to form part of Essential's revenue proposals for the 2019-20 to 2024-25 regulatory periods.

15. Essential has estimated over a particular period the base price of the units that it seeks to escalate. This is important to escalation because the escalation factors must consistently commence escalation of prices from the correct base period. The base periods applying to the objects to be escalated by Essential are presented in Table 1 below.

Table 1: Essential base periods

Cost category	Base period
Opex	2017-18 financial year
Capex	2017-18 financial year
Other	2017-18 financial year

16. It is important that escalation factors do not either omit or double-count price changes over a particular period of time. Whilst all these criteria may seem trivial, it is our experience that achieving timing consistency is one of the most difficult and contentious issues in the development of escalation factors. For example, the calculations described in Appendix A show that it can be particularly challenging in the context of utilities labour costs.

2.3 Quarterly indexation using annual escalators

17. Some of the forecasts that we have regard to in deriving escalation factors, such as those provided by Deloitte Access Economics, express forecast changes as the change in average prices from one financial year to the next. These lend themselves naturally to use as financial year escalation factors, as described above.

18. However, sometimes forecasts expressed in this way cannot be so readily used. For example, forecasts of wages growth should only be applied after the expiry of known enterprise bargaining agreements (EBAs). If this transition occurs at the end of a financial year then calendar year forecasts can not straightforwardly be applied to the data in order to project it forward.

19. In the past, the AER has accepted that its forecasts could be used to construct a quarterly index that could then be used to estimate forecasts or escalators based on alternative timing assumptions. Econtech proposed a four-part equation,[2] an example of which is:

$$Index\ Sept\ 08 = (2 * Index(07-08) + 7 * Index(08-09) - Index(09-10))/8$$

$$Index\ Dec\ 08 = (9 * Index(08-09) - Index(09-10))/8$$

$$Index\ Mar\ 09 = (-Index(07-08) + 9 * Index(08-09))/8$$

$$Index\ Jun\ 09 = (-Index(07-08) + 7 * Index(08-09) + 2 * Index(09-10))/8$$

20. The main rationale behind the choice of these formulae was that the quarterly index derived by their use was consistent with the annual forecasts from which they were estimated. We note that that this set of formulae is not the only method by which such an index could be constructed, but we regard it as reasonable for its purpose. We also employ these formulae, translated by two quarters, to convert forecasts expressed in average calendar year terms into a quarterly index.

2.4 Precision and accuracy

21. We note the distinction between precision and accuracy. Although there is considerable imprecision in predicting the future, this is not a reason to unnecessarily estimate escalation factors that are artificially biased upward or downward, even if this bias is relatively small.

22. In Appendix A we describe why a transition between Essential's actual EBA wages data and forecasts of future wage growth must be carefully made to avoid bias in the escalation factors. We consider this to be an issue of accuracy, rather than precision, since it involves making efficient and consistent use of the data available to come to the best forecast escalation factors given the circumstances.

[2] Econtech, *Updated labour cost growth forecasts*, 25 March 2009, pp.23-4

3 Forecasts of labour cost inputs

23. This section sets out the specific considerations that have been made regarding the derivation of labour cost escalators for Essential's expenditure programs. These considerations guide the data sources and methodology that have been selected in each case.

24. Public estimates are available from Deloitte Access Economics (commissioned by the AER) for the growth of average annual wages in different sectors in New South Wales.

25. We consider that, following the approach of the Australian Competition Tribunal in Energex,[3] it is reasonable to use actual measures of changes in staff costs where these are available in preference to the much broader measures that are available for the entire utilities industry. We have therefore used actual salary increases paid by Essential and committed future increases where these are available to estimate utilities industry labour escalation factors. Escalation factors beyond this horizon are based on the utility wage price index forecasts sourced from Deloitte Access Economics.

26. The February 2017 forecast by Deloitte Access Economics provides data for utility wage price index till June 2023. In order to forecast cost escalation factors beyond June 2023, we assume that the wage cost index increases in line with the average of the previous 5 years of DAE estimates.

27. Transitioning from modelling wage increases as occurring once a year, based on actual data, to an index based on quarterly changes in wages can result in a biased estimate of wages escalation. That is, we are transitioning from an index that measures actual wage-setting processes, where Essential Energy pays their employees wage increases four quarters of increase 'up front', to a stylised framework that assumes it can spread these increases out over a year. Under such a transition, even if the actual wage outcomes and the wages forecasts are perfectly consistent, escalation factors may be underestimated or overestimated. Appendix A contains a full discussion of the nature of this problem and the solutions that CEG has applied to resolve this bias.

28. In all cases, to ensure consistency with the forecasts, we have estimated:

    - financial year escalation factors based on financial year on financial year growth forecasts obtained from DAE; and
    - calendar year escalation factors based on financial year on financial year growth forecasts obtained from DAE.

[3] Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11 (24 December 2010)

3.1 Utilities labour

29. The following table sets out known EBA increases in nominal labour costs.

Table 2: EBA labour cost, nominal

Financial year	2016-17	2017-18
Essential Energy	3.2%	1.7%

Source: Essential Energy

30. Table 3 below presents financial and calendar year real escalation factors based upon actual and committed EBA increases spliced with DAE forecasts for utilities sector wage price index growth. The 2017-18 figure is based on EBA nominal data above less expected inflation.

Table 3: Escalation factors for utilities sector labour, real

Financial year		2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Essential Energy		-0.3%	1.2%	1.0%	1.0%	1.1%	1.2%	1.0%
Calendar year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Essential Energy	0.5%	0.4%	1.0%	1.0%	1.0%	1.2%	1.1%	1.0%

Source: CEG analysis, Essential and Deloitte Access Economics

31. Table 4 below presents financial and calendar year escalation factors based upon Deloitte Access Economics' forecasts for general labour wage price index growth.

Table 4: Escalation factors for general labour, real

Financial year		2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Essential Energy		0.2%	0.8%	1.1%	1.0%	1.1%	1.1%	1.0%
Calendar year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Essential Energy	0.0%	0.5%	1.0%	1.1%	1.0%	1.1%	1.1%	1.0%

Source: CEG analysis and Deloitte Access Economics

3.2 Weighting labour and non-labour materials

32. In its recent decision for AusNet the AER did not accept AusNet's actual weights (83% labour and 17% materials) and instead imposed a 'benchmark' weight (62% and 38%). The 62% split has also currently been adopted in the AER's TransGrid's transmission

determination draft decision.[4] However the AER is currently undertaking the process to update the labour and non-labour weight in its 2017 Benchmark Report for transmission businesses.

33. We consider that the AER's current position is not correctly constructed on two grounds. First, the AER's estimate is of 62% labour weighting is based on an out of date 2004 study by Pacific Economics Group using regulatory account data only for Victorian distribution service providers.[5] This is problematic both in terms of the age of the study but also the limited number of comparators.

34. But more importantly, each business faces a different operating environment and will have, under incentive regulation, adapted its operations to that environment. This will involves some firms having an efficiently higher share of total costs that are labour than others. In particular, firms operating in high labour cost environments will have a higher than average efficient proportion of labour costs in overall opex costs. Similarly, firms that operate in low labour cost environments will have a lower than average efficient cost of labour in their overall opex costs.

35. It is unreasonable to penalise (reward) firms that operate in high (low) labour cost environments by applying a positive real labour cost escalation to a 'benchmarked' labour share of opex costs that is lower (higher) than their efficient share of opex costs.

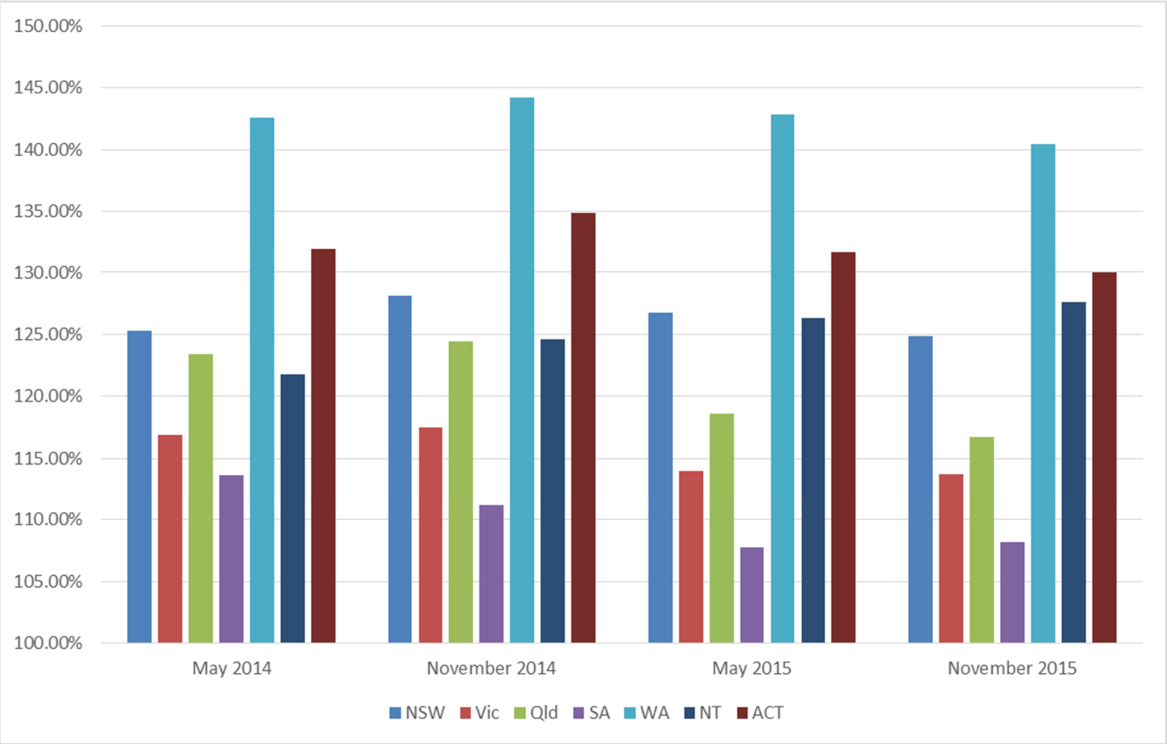
36. The difference in labour costs can be illustrated in Figure 1. Figure 1 shows the private sector average weekly earnings[6] of each state and territory expressed as percentage of Tasmania's earnings. In the case of Western Australia, the average earnings is more than 40% higher compared to Tasmania in 2014 and 2015. Furthermore the dispersion in earnings across states varies across time (for example, the QLD/TAS wage differential has fallen materially in over the period).

4 See Section 7.4.2.1 of AER, (2017) TransGrid transmission determination 2018 to 2020 Draft Decision, Attachment 7.

5 AER, letter to regulatory managers from Sebastian Roberts, dated 16 March 2017.

6 Average weekly earnings for full time, adult, ordinary time cash earnings in private sector

Figure 1: Dispersion in average earnings across states



Source: CEG analysis using data from Australian Bureau of Statistics

37. In our view, to the extent that there is any reliance on benchmarking labour cost shares then there must be a like-for-like comparison in the choice of the labour and non-labour weight. This needs to take account of the fact that some firms operate in higher labour cost environments than others.

38. In addition to unit labour cost differences facing firms it is also the case that different firms will be in a different technological environment. Depending on the nature of their network design and asset age profile then two firms may have very different optimal mix of labour versus other input costs. For example, a firm with, on average, older assets may require more intensive ongoing management of those assets than a firm that has, on average, newer assets. Similarly, a firm that has invested heavily in 'smart grid' technology may have lower average labour costs than another firm (but a higher RAB and, therefore, higher capital costs).

39. In summary, there are good reasons for the proportion of total opex that is labour to vary across firms. This is because both:

    - the unit price of labour firms face are different depending on their location; and
    - the efficient number of units of labour to use (relative to other inputs) varies across firms in different circumstances.

40. Any benchmarking of 'the' efficient proportion of labour costs in opex would need to factor in these considerations. In our view, the data is simply not available to do this accurately and, in this context, the correct approach, most consistent with incentive regulation, is to use a firm specific estimate of the proportion of costs that are labour costs.

3.3 Productivity adjustment

41. We note that DAE provides the AER with "productivity-adjusted" real wage growth indexes (typically around 1% lower than real wage growth which makes them commonly negative). The AER has, in previous draft decisions (Powerlink and Aurora), discussed using these productivity adjusted figures. However, the AER has correctly not used them in any final decisions.

42. This is correct because the 'productivity' measure embedded in them is a measure of labour per unit of MWh for the industry – such that 'productivity' increases with increased economies of scale across generation and transport. This is not the relevant measure of productivity for a regulated distribution business because.

43. To the extent that any productivity gains are to be modelled these should be modelled directly in the opex and capex programs and explicitly justified on the basis of fewer workers required deliver the necessary maintenance/expansion projects.

3.4 WPI is a conservative estimate

44. In this report we have used the wage price index (WPI) rather than AWOTE. However, it is likely that WPI underestimates the true increase in labour because not all pay increases associated with changes in job classification are fully offset (or even offset at all) by increases in productivity. That is, wage increases associated with changes in job classification are used, in part, to deliver wage increases that are necessary to retain staff in a competitive labour market – rather than wage increases that deliver higher productivity. However, the WPI incorrectly treats such wage increases as not raising the overall unit cost of labour.

Appendix A Derivation of escalation factors for utilities industry labour

45. This appendix describes in greater detail the derivation of the escalation factors for utilities industry and general labour, as reported at section 3 above. Whilst the appendix is self-contained, it can most easily be understood in conjunction with the spreadsheets accompanying this report, where the calculations described here are set out in full.

A.1 Utilities industry labour costs

46. Essential has have provided CEG with a history and timeline of committed EBA salary increases till June 2017.

47. Since these are nominal increases, it is reasonable to treat these as increases to a nominal index of wages at the dates that they occur and to deflate this nominal index to create a real index that can be used for the purpose of estimating real escalation factors. We have created a quarterly nominal index of Essential's salaries and deflated this index by the quarterly index of inflation, the derivation of which is described at section 2.1.

48. Beyond the period in which Essential's actual EBA salary increases are available, the index of utilities industry wages can be extended by using professional forecasts. We have relied on Deloitte Access Economics forecasts.

49. The timing of these forecasts also lend themselves to the use of the formulae, described in section 2.3, to derive a quarterly index based on the average annual forecast wage changes. We use this quarterly index, so derived, to extend forward the index based on actual EBA salary increases.

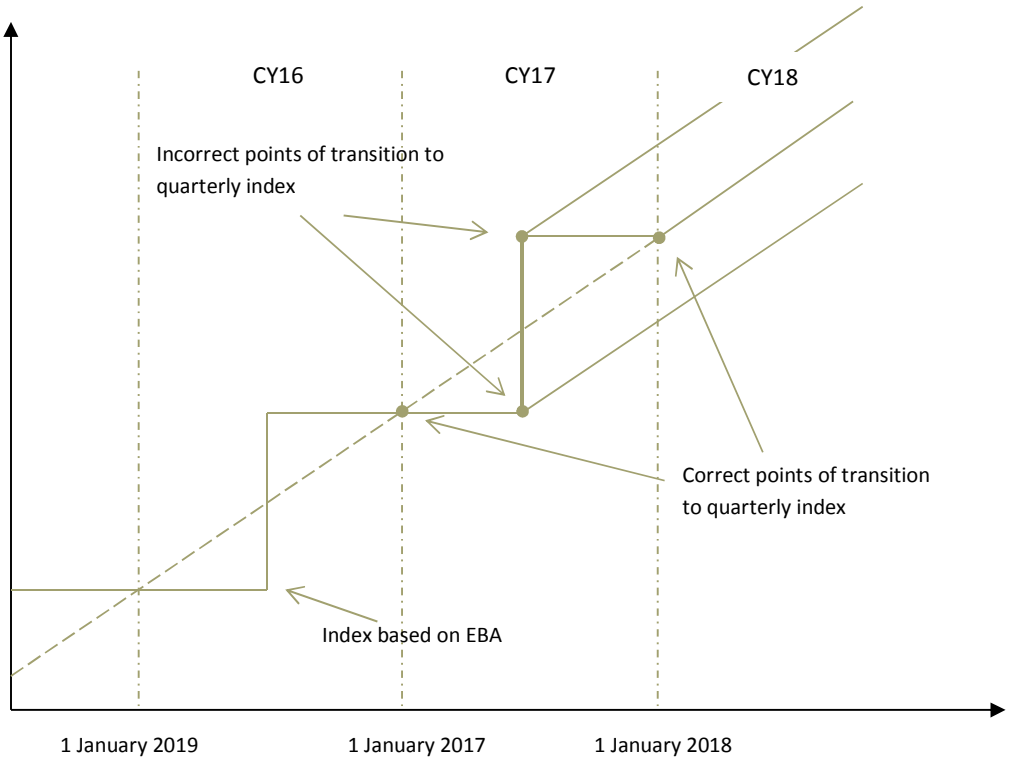
50. However, the timing and nature of this transition to forecasts must be carefully considered since, if implemented at the wrong time or incorrectly, the transition from an index based on discrete wage increases to an index based on quarterly changes in wages can result in a biased estimate of wages escalation. That is, we are transitioning from an index that measures actual wage-setting processes, where Essential pays its employees wage increases 'up front', to a stylised framework that assumes it can spread these increases out over a year. Under such a transition, even if the actual EBA outcomes and the wages forecasts are perfectly consistent, escalation factors may be underestimated.

A.1.1 Estimating calendar year escalators

51. Figure 2 provides a stylised example of the transition from EBA outcomes to forecasts at the final committed EBA increase on 1 July 2017. The escalation factor for the following calendar year will underestimate the correct level of wages escalation,

relative to what would have been estimated if the index based on wage increases were extended from 1 July 2017 onwards.

Figure 2: Illustration of potential for error transitioning to utilities industry quarterly index, financial year escalators



52. As Figure 2 demonstrates, unbiased calendar year escalators can be derived by transitioning to quarterly forecasts on 1 January. In this context, it makes most sense for this transition to occur on 1 January 2018, since this uses all the actual EBA data available which, as we stated earlier, should receive preference over more generalised forecasts due to its greater specificity.

A.2 Estimating financial year escalators

53. Although the methodology described above can be used to estimate financial year escalation factors that are unbiased with respect to a single, consistent underlying view regarding the rate of change of utilities industry wages, the same methodology does not yield consistent calendar year escalators.

54. As Figure 3 indicates, transitioning to a quarterly index from 1 July 2017 without applying a step change from that date will underestimate the average level of wages in the 2020 calendar year. However, applying a full year of wage increase on 1July 2017 will cause wages in the subsequent calendar year to be too high.

55. The correct method of transition, in order to accurately calculate the 2020 calendar year escalator, is to apply as at 1 July 2018 half a year of escalation in a step change. This increase can be constructed using the forecasts of utilities industry wages.

Figure 3: Illustration of potential for error transitioning to utilities industry quarterly index, calendar year escalators