Attachment H.2

NERA - Expert report on Labour Escalation

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NERA
ECONOMIC CONSULTING

Expert Report on the Allowed Rate of Change in SA Power Networks' Expenditure due to Expected Inflation in Labour Costs

Prepared for SA Power Networks, CitiPower and Powercor Australia

23 June 2015

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1. Introduction

1.1. Scope of this Report

1. I have been commissioned to prepare this report for SA Power Networks, CitiPower Pty ("CitiPower") and Powercor Australia Ltd ("Powercor"). The context for this report is the review by the Australian Energy Regulator ("AER") of the revenues that Australian Distribution Network Service Providers ("DNSPs") are allowed to recover from customers, and in particular the AER's Preliminary Decision in respect of the determination of SA Power Networks' revenues for the 2015−20 regulatory control period.

2. This report, following my instructions in Appendix A, reviews the basis for the AER's proposed "rate of change" in allowed revenues to cover future changes in operating expenditure ("opex") and capital expenditure ("capex") due to expected growth, above the rate of inflation in the Consumer Price Index ("CPI"), in DNSPs' labour costs.

1.2. My Expertise

3. I am a Senior Consultant of NERA UK Limited, which trades as NERA Economic Consulting ("NERA"). NERA is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges.

4. I have been an employee of NERA UK Limited since 2006, and I am based in the London office. I hold an MPhil degree in Economics from the University of Cambridge and a BSc in Economics and Econometrics from the University of Bristol.

5. My role at NERA includes advising a range of clients, including SA Power Networks, CitiPower and Powercor, on matters related to the economic analysis of gas and electricity markets, and the regulation of electricity, gas and water network companies. In particular, I have advised a range of companies on matters related to the assessment of costs by regulators at periodic reviews of their price controls.

6. My Curriculum Vitae, including a list of my project experience, is appended to this statement as Appendix B.

1.3. Report Structure

7. The remainder of this report is structured as follows:

   i. In Chapter 2, I describe the context for the AER's Preliminary Decision in respect of the revenues that SA Power Networks is allowed to recover from consumers and the methods the AER uses to forecast operating costs.

   ii. In Chapter 3, I evaluate whether the AER's Preliminary Decision in respect of SA Power Networks' proposed rate of change in operating costs to cover expected inflation in labour costs is consistent with the National Electricity Objective ("NEO") as set out in the National Electricity Law ("NEL"), as well as its requirements under the National Electricity Rules ("NER") to estimate opex or capex that reasonably reflects the opex and capex criteria. In particular, I consider the extent to which the AER's decision ensures that DNSPs are "*provided with a reasonable opportunity to recover at least* [their]

efficient costs"[1], a core principle of the NEL, whether it reflects "*the costs that a prudent operator would require to achieve the operating expenditure objectives*"[2], as set out in the NER, and whether it ultimately fulfils the NEO, which is to "*promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity*".[3]

iii. In Chapter 4, I conclude by recommending changes to this aspect of the AER's preliminary decision that would better meet its obligations under the NEL and the NER.

1.4. Declaration

8. I declare that I have read and understood the Federal Court's Practice Note CM7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", and that I have prepared this report in accordance with those guidelines. I confirm that I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from this report.

SIGNED Richard Owen .....

DATED 22nd June 2015 .....

1 National Electricity (South Australia) Act 1996, para. 7A, page 38.

2 National Electricity Rules, rules 6.5.6 (c) and 6.5.7 (c). Note that I have quoted Clause 6.5.6 (c), which relates to operating expenditure. Clause 6.5.7 (c) is identical except that references to operating expenditure are instead references to capital expenditure.

3 National Electricity (South Australia) Act 1996, para. 7, page 38.

2. Alternative Forecasts of Labour Cost Inflation

2.1. Background

9. The AER regulates the revenues that gas and electricity network companies in Australia (apart from Western Australia and the Northern Territory) are allowed to recover from consumers. Within the six states and territories under its jurisdiction, there are thirteen DNSPs which own the electricity distribution infrastructure. Each DNSP is a regional monopoly, some of which are state-owned and some of which are private entities.

10. The AER regulates each DNSP in five-year cycles. At periodic reviews it applies a combination of techniques to determine the amount of revenue the DNSP should be allowed to recover in the coming regulatory period. The AER is in the process of setting the allowed revenue of SA Power Networks, together with the Queensland (QLD) distribution networks, for the regulatory control period running from July 2015 to June 2020. The AER published its Preliminary Decisions for these DNSPs on 30 April 2015. At the same time, the AER published its final decisions on the New South Wales (NSW) and Australian Capital Territory (ACT) distribution networks' 2014-19 regulatory proposals. The AER will publish its Preliminary Decisions of allowed revenues for the Victorian DNSPs (including CitiPower and Powercor) in October 2015.

11. There are several components of the AER's decision that affect a DNSP's allowed revenue. Broadly speaking, the AER follows three main steps in setting the opex allowance for a DNSP:

    (i) The AER selects a "base year" (typically the second or third to last year of the preceding control period[4]) and assesses whether opex in this year reasonably reflects the "opex criteria" specified by NER.[5] As part of this step, the AER compares the costs of the thirteen DNSPs (including those for which the AER is not in the process of setting allowed revenues) through a process called "benchmarking". Through this benchmarking of DNSPs' opex, the AER estimates the level of opex it deems "efficient" in a base year, which differs for each company because the benchmarking controls for some differences between DNSPs, such as the size of their respective networks.

    (ii) The AER then determines the rate at which it expects DNSPs' efficient operating expenditure to change between this base year and the end of the upcoming control period. The AER considers that efficient costs may change over time due to changes in the "outputs" companies deliver, such as growth in demand or the number of customers they serve, changes in the prices of the factor inputs DNSPs purchase in order to run their businesses, such as labour, and changes in productivity. The AER sets allowed rates of change for all three factors, which combine to determine the AER's allowed "rate of change" in operating expenditure.

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4 AER (2014): *SA Power Networks draft decision – Attachment 7: Operating expenditure*, Page 16-17.

5 NER, clause 6.5.6(c).

(iii) The AER then adjusts projected operating expenditure to account for any other forecast changes in cost over the upcoming control period. These adjustments are referred to as "step changes" in operating expenditure.

12. As noted in Section 1.1 of this report, and as set out in my instructions in Appendix A, this report reviews the AER's proposed "rate of change" in respect of expected changes in DNSPs' labour costs over the course of the upcoming regulatory control period.

13. The AER's capex allowance also depends on a forecast of the rate of change in materials and labour costs. The labour cost rate of change used for capex is the same as the rate used for opex, so unless otherwise noted, my conclusions in this report apply to capex as well as opex.[6]

14. The criterion against which I make this assessment is the AER's obligations set out in the NEL and the NER. In particular, I consider:

    i. the extent to which the AER's decision takes into account the NEL revenue and pricing principle that DNSPs are "*provided with a reasonable opportunity to recover at least the efficient costs*";[7]

    ii. whether the decision reflects "*the costs that a prudent operator would require to achieve the operating expenditure objectives*",[8] as set out in the opex and capex criteria in the NER; and

    iii. whether the decision ultimately meets the NEO as set out in the NEL, which is "*to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity*".[9]

15. Therefore, I evaluate as an economic expert whether the AER's proposed rate of change in respect of labour cost inflation represents a reasonable forecast of the inflation in efficient labour costs that SA Power Networks will incur over the period to 2020.

16. The remainder of this chapter sets out factual background in relation to SA Power Networks', CitiPower's and Powercor's forecasts of labour cost inflation, the AER's evaluation of this proposal for SA Power Networks and the alternative forecast that ultimately informed its Preliminary Decision.

2.2. SA Power Networks' Forecast of Labour Cost Inflation

17. SA Power Networks engaged Frontier Economics to forecast the rate at which labour costs would rise in excess of inflation in the CPI (described as a "real labour cost escalation rate"),

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6 AER (2014): *SA Power Networks draft decision – Attachment 6: Capital expenditure*, Page 29.

7 National Electricity (South Australia) Act 1996, para. 7A, page 38.

8 AEMC: *National Electricity Rules*, Clause 6.5.6 (c) and Clause 6.5.7 (c). Note that I have quoted Clause 6.5.6 (c), which relates to operating expenditure. Clause 6.5.7 (c) is identical except that references to operating expenditure are instead references to capital expenditure.

9 National Electricity (South Australia) Act 1996, para. 7, page 38.

as measured by the average rates of change in wages agreed in Enterprise Agreements ("EAs")[10] amongst a comparator group of similar companies.[11]

18. SA Power Networks' regulatory proposal forecast inflation in its labour costs using its existing EA for 2015–16 and 2016–17, and then using Frontier Economics' recommended extrapolation of long-term EAs from the comparator group for the remainder of the regulatory control period.[12] The comparator group of companies used by Frontier Economics includes all privately-owned electricity network businesses (transmission and distribution) in Australia.[13] SA Power Networks' forecasts of labour price escalation are set out in Table 2.1 below.

Table 2.1
SA Power Networks' Proposed Labour Cost Escalation

	2014-17 EAs		Frontier Economics' Forecast		
	2015/16	2016/17	2017/18	2018/19	2019/20
Nominal %	4.25%	4.25%	4.37%	4.37%	4.37%
Forecast CPI %	2.55%	2.55%	2.55%	2.55%	2.55%
Real %	1.66%	1.66%	1.77%	1.77%	1.77%

Source: SA Power Networks, Regulatory Proposal 2015 – 20[14]

19. Although the AER's Preliminary Decisions in respect of these companies have not been released yet, CitiPower and Powercor have applied the same approach as SA Power Networks to forecast the rate at which labour costs will rise. CitiPower and Powercor applied the wage growth rate set out in their existing EAs for the period until expiry and the average rates of change in wages agreed in EAs amongst a comparator group of similar companies developed by Frontier Economics for the period thereafter.[15]

20. SA Power Networks forecast contracted labour costs together with contracted construction costs, using an average of forecast growth rates in the construction sector Wage Price Index ("WPI") from BIS Shrapnel and Deloitte Access Economics ("DAE").[16]

21. SA Power Networks proposed a construction sector price index on the basis that "*the construction sector most accurately reflects the true costs SA Power Networks incurs in*

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[10] Alternatively referred to as Enterprise Bargaining Agreements ("EBAs").

[11] SA Power Networks, *Regulatory Proposal 2015-2020*, page 266.

[12] SA Power Networks, *Regulatory Proposal 2015-2020*, page 267.

[13] Frontier Economics (2014): *Forecasting labour cost escalation rates using EBA outcomes*, August 2014, page 40.

[14] SA Power Networks' Regulatory Proposal (page 267) incorrectly lists the 2015/16 and 2016/17 nominal growth rates as 4.50%. SA Power Networks corrected this in an addendum to its proposal sent to the AER.

[15] CitiPower, *Regulatory Proposal 2016-2020*, page 72 and Powercor Australia, *Regulatory Proposal 2016-2020*, page.74.

[16] SA Power Networks, *Regulatory Proposal 2015-20*, page 267.

relation to contracted construction and labour services".[17] However, the AER rejected SA Power Networks' proposal, arguing that "*if labour is employed by a business that operates in the utilities industry, then it should be escalated by the EGWWS industry forecast*".[18]

2.3. The AER's Forecast of Labour Cost Inflation

22. The AER rejected SA Power Networks' labour cost escalation forecasts on the basis of the following arguments:

    i. In the AER's view, "*SA Power Networks' use of its EA and benchmark EAs did not account for the corresponding impact on its opex productivity*", whereas, it argues, its preferred methodology "*is also consistent with our productivity forecast methodology*".[19]

    ii. The AER argues that "*in general a privately owned distribution service providers'* [sic] *benchmark EA does not reflect a significant portion of its in-house labour.* […] *We note less than half of the staff of CitiPower, Powercor and AusNet Services staff are employed under their respective EAs. Further, the privately owned distribution service providers outsource a large proportion of their opex".*[20]

    iii. The AER considered submissions from Business SA, South Australian Wine Industry Association and Consumer Challenge Panel which argued that SA Power Networks' growth forecasts are "*extremely generous*", and "*are not reflective of* […] *current economic conditions in South Australia*".[21]

23. Instead of using SA Power Networks' labour cost forecasts in Table 2.1, the AER commissioned a forecast of wages in the electricity, gas, water and wastes services ("EGWWS") industry in South Australia from DAE, which the AER used to set allowed rates of change for labour cost inflation. DAE's report explains that the forecast comes from its proprietary labour cost model, linked to its macroeconomic model. DAE also states that it made adjustments to account for (i) industry and state-specific differences in macroeconomic performance, (ii) industry-specific productivity growth differences, (iii) wage growth in industries requiring similar skills, (iv) "*user-defined adjustments […] when other data is volatile (which employment data currently is) and when factors not relevant to wage determination are having effects on broader output and employment measures*".[22]

24. Table 2.2 below compares the AER's forecast of labour costs with that of SA Power Networks. As the table shows, DAE forecasts wages growth in the EGWWS industry in

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[17] SA Power Networks, *Regulatory Proposal 2015 – 20*, page 267.

[18] AER (2015), Attachment 7, page 61.

[19] AER (2015), Attachment 7, page 50 & 55.

[20] AER (2015), Attachment 7, page 51.

[21] AER (2015), Attachment 7, page 53.

[22] Deloitte Access Economics (2015): *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER*, 23 February 2015, pages 108-110. Note, I have reviewed this DAE report in which it presents its wage cost forecast, and concluded that it does not describe DAE's methods and assumptions in sufficient detail to robustly appraise the reasonableness of its wage forecast critique (see Section 3.2).

South Australia that is materially slower than the actual and forecast growth in EAs that underpin SA Power Networks' forecasts.

Table 2.2
Real Price Growth Forecast for Labour (AER vs SA Power Networks)

	2015/16	2016/17	2017/18	2018/19	2019/20
AER	–0.11%	0.40%	0.42%	0.51%	0.56%
SA Power Networks	1.66%	1.66%	1.77%	1.77%	1.77%

Source: AER, DAE

2.4. The AER's Proposed Rate of Change in Operating Costs to Cover Labour Cost Inflation

25. The AER calculates its allowed rate of change for DNSPs' operating expenditure using the following formula, in which $\Delta Price$ denotes projected growth in input prices, $\Delta Output$ denotes projected growth in the volume of outputs delivered, and $\Delta productivity$ denotes projected productivity growth.

$$\Delta Opex = \Delta Price + \Delta Output - \Delta productivity$$

26. The AER derives its estimate for overall input price growth by taking the weighted average of its forecast growth in labour and non-labour costs, where the weightings (W_L and W_{NL}) are intended to reflect the relative share of labour and non-labour costs in operating expenditure and are based on Pacific Economic Group's (PEG) analysis of Victorian DNSPs' regulatory accounts from 2003:[23]

$$\Delta Price = W_L \times \Delta Price_L + W_{NL} \times \Delta Price_{NL}$$

27. The AER applies its forecast rate of change to its estimate of opex for the final year of the current regulatory control period (ie. 2014-15 for the 2015-20 regulatory control period) to give an initial estimate of opex for the upcoming regulatory control period. The AER then adds any allowed step changes to these initial estimates to give the final opex allowance.

28. By way of illustration, below I provide a step-by-step breakdown of the calculation of SA Power Networks' allowed opex for 2015-16:

- The AER estimates labour prices and non-labour prices will grow by -0.11 per cent and 0 per cent respectively in real terms. Applying a weighting of 62 per cent to labour costs yields an input price growth estimate of 0.62 × -0.11 + 0 = -0.07.

[23] Pacific Economics Group (PEG) (2004), *TFP Research for Victoria's Power Distribution Industry*, Report prepared for the Essential Services Commission, Madison.

- The AER combines the above input price growth estimate with an output growth estimate of 0.57 per cent to give a total rate of change of 0.5 per cent, making no adjustment for productivity.
- Finally, the AER applies this rate of change estimate to its estimate of SA Power Networks' 2014-15 opex of $239.1 million to give an estimated 2015-16 opex of $240.2 million, to which it adds a $0.3 million step change to arrive at SA Power Networks' final opex allowance of $240.5 million.

3. Evaluation of the AER's Decision

29. As described in the preceding chapter, the AER did not accept SA Power Networks' argument that its allowed rate of change in operating expenditure should be based on its current EA and the Frontier forecast of future EAs using a comparator group of electricity network companies. Rather, the AER opted to use a forecast of the EGWWS wage index based on a study from DAE. It then applied a 62% weighting to this forecast to estimate the total impact of growth in labour costs on growth in input prices, based on assumptions contained in a 2004 report from PEG. The AER assigned a weighting of 38% to non-labour input prices, for which it assumed zero real growth (ie. non-labour costs grow in line with CPI).

30. In this chapter, I compare the alternative methodologies for forecasting inflation in SA Power Networks' labour costs, and evaluate the basis for the AER's decision in this regard. I also evaluate the choice of weighting the AER used to convert a forecast of the EGWWS market wage index into a forecast of growth in labour costs for SA Power Networks. The main criterion against which I evaluate this decision is whether it fulfils the AER's obligations, under the NEL, to provide DNSPs with a reasonable opportunity to recover their efficient costs, and the NER to reflect the efficient and realistic costs a prudent DNSP would incur to achieve the operating (and capital) expenditure criteria.

3.1. The Choice between EAs and Forecasts of EGWWS

3.1.1. Criteria for choosing between EAs and EGWWS wage forecasts

31. When selecting a measure of labour prices for the purpose of forecasting growth in DNSPs' opex, Section 7A of the NEL provides that the AER should take into account whether companies have a reasonable opportunity to recover efficient expenditure:

> *"A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in*
>
> *a. providing direct control network services; and*
>
> *b. complying with a regulatory obligation or requirement or making a regulatory payment"*

32. Similarly, paragraph 6.5.6 (c) of the NER requires that:

> *"The AER must accept the forecast of required operating expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects each of the following (the operating expenditure criteria):*
>
> *(1) the efficient costs of achieving the operating expenditure objectives; and*
>
> *(2) the costs that a prudent operator would require to achieve the operating expenditure objectives; and*

(3) a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

Paragraph 6.5.7 (c) of the NER reads identically but with respect to capital expenditure rather than operating expenditure.

33. In other words, the chosen measure should, as closely as possible, reflect the actual labour costs the DNSPs can reasonably expect to incur over the regulatory control period, as long as these costs are "efficient". Given that the AER applies its labour inflation forecast to its assessment of efficient base year expenditure determined through benchmarking, the AER indicates that, in order to meet this standard, "[t]*he choice of labour price measure should reflect the annual change in labour price for electricity distribution workers*".[24] However, as I describe in Chapter 2, the AER and SA Power Networks disagree about the most reliable basis for forecasting inflation in the labour price for electricity distribution workers.

3.1.2. Comparing the relevance of EGWWS industry wage forecasts and EAs as means of forecasting DNSPs' labour costs

34. Ideally, labour price escalation forecasts should reflect the specific labour costs faced by DNSPs in South Australia. However, there is no external data series which directly measures these costs. Therefore, SA Power Networks has submitted a forecast of labour costs based on its own EAs and a forecast of future EAs from an independent consultant, Frontier Economics, as I describe above.

35. However, as described above, the AER opts not to use this forecast for a range of reasons. The first reason the AER gives is that "[o]*utsourced labour is not covered by the service providers' EAs, but it is still an input used to provide operating and maintenance services required by the service provider*".[25] This criticism is not valid, as SA Power Networks has, in fact, applied separate growth forecasts for its in-house and outsourced construction and labour services, weighted according to their relative share in total costs.

36. Furthermore, the EAs do apply to some contracted work. For example, SA Power Networks' 2014 EA stipulates that in cases where contractors cover work for "*the absence of Utilities Management*[26] *employees on leave; temporary vacancies;* [and] *peak workloads in areas normally staffed by Utilities Management employees"*, the contractor must pay its workers, "*as a minimum, the total Utilities Management rate comprised of the Enterprise Agreement rate of pay* […] *and regularly paid allowances for the classifications appropriate to the duties being performed*".[27]

37. Additionally, the AER's observation that *"less than half of the staff of CitiPower, Powercor and AusNet Services staff are employed under their respective EAs"* does not undermine the use of EAs to forecast in-house labour growth, because the EAs should still serve as a good

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[24] AER (2015), Attachment 7, page 51.

[25] AER (2015), Attachment 7, page 51.

[26] Utilities Management Pty Ltd is the legal entity which employs SA Power Networks' in-house staff.

[27] Utilities Management Pty Ltd: *Enterprise Agreement 2014,* Attachment 2, para. 7.6, page 58.

proxy for the wages of other employees. As the extracts shown in the preceding paragraph from SA Power Networks' 2014 EA demonstrate, an employee does not need to be part of a union to receive an EA wage settlement.

38. SA Power Networks' EA "*is binding upon* […] *Utilities Management employees whose classification is covered by Appendix 1A and 1B of Attachment 2*",[28] which refers to all employees on its structured salary scale and its structured wage scale, respectively. According to SA Power Networks, this represents approximately 90% of salaried employees and 100% of wage-earning employees. The only employees not covered by the EA are about 100 senior management personnel who are on individualised contracts.[29]

39. Likewise, in the case of CitiPower and Powercor, the Electrical Trade Union ("ETU") may be more influential than the AER suggests. Rick Catanzariti, a partner at the law firm DLA Piper Australia, opines that "*the electricity industry is highly unionised.* […] *The ETU* […] *represents the majority of electrical workers at CitiPower/Powercor Australia*".[30]

40. In contrast to SA Power Networks' forecast of labour costs based on EAs, which focuses on the specific labour costs faced by electricity distribution companies, the EGWWS wage index used by the AER covers workers from other utilities, as well as the electricity industry. It also covers workers from the non-network side of the electricity sector (generation and retail), which bear few similarities to distribution networks. Hence, the EGWWS index is less relevant for forecasting costs in the electricity distribution industry than the EAs.

41. To the extent that some workers have skill sets that allow them to work across all utility industries, as is most likely to be the case for contractor labour, the AER's forecast of the EGWWS wage index may reflect the market trends that determine the cost of hiring contractor labour for outsourced functions. Nonetheless, these trends appear materially less relevant as a measure of in-house labour costs than the EAs of electricity distributors.

42. One potential shortcoming in relation to the use of EAs to forecast opex is that setting allowances based on companies' own costs may undermine the incentive provided to the firm through the regulatory control to minimise its operating costs. However, any incentive a DNSP may have to raise wages set through EAs is mitigated by basing allowances on an average of a group of EAs in the relevant industry, which is the approach used by Frontier Economics. It is also mitigated by the incentive provided to companies to reduce operating costs during regulatory control periods.

43. Overall, therefore, there is no basis for a conclusion that the EAs are a less relevant metric for forecasting growth in labour costs for DNSPs than the AER's forecast of wages in the EGWWS sector as a whole. In fact, the most relevant index for tracking DNSPs' labour costs would be to apply the EA forecast to in-house labour and base a wage forecast for contracted labour on some market-based forecast measure of wage inflation, such as a forecast of

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[28] Utilities Management Pty Ltd: *Enterprise Agreement 2014*, Clause 3, page 2.

[29] As advised by SA Power Networks.

[30] Rick Catanzariti (2015), *Enterprise Bargaining Agreements*, 26 March 2015, para. 30.

EGWWS wages or the SA Power Networks proposal to use BIS Shrapnel WPI for the South Australian construction sector.

3.1.3. Accounting for the relationship between labour productivity and wage growth

44. Another reason why the AER chose not to use SA Power Networks' proposed data for labour cost growth was that, the AER alleges, the data are inconsistent with the AER's forecast of zero productivity growth. The AER explains its rationale:[31]

> *"SA Power Networks EA wage increases, which are higher than current market conditions, are only efficient if they are to compensate labour productivity gains. [...] SA Power Networks forecast wages for staff on its EA to increase by an average of 1.73 per cent each year from 2014-15 to 2019-20 in real terms. We would expect there to be an increase in productivity to offset this real increase in prices. However, SA Power Networks forecast zero productivity [growth]. […] This is because over the long term labour price growth adjusted for labour productivity is equal to the change in the CPI. Professor [Jeff] Borland demonstrates this in analysis that shows that, on average from 1997-98 to 2009-10, CPI plus labour productivity matched the average weekly ordinary time earnings (AWOTE)."*

45. In other words, the AER is of the opinion that, on average, efficient real wage increases should only be driven by productivity increases. Therefore, the AER argues, SA Power Networks' wage increases are inefficient because SA Power Networks is not forecasting any productivity growth.

46. On a macro-economy basis, the link between productivity growth and real wage growth is consistent with economic theory. In fact, the AER refers to research from Professor Jeff Borland which shows that between 1997-98 and 2009-10, the average economy-wide nominal wage growth (4.55% per annum, as measured by the Average Weekly Ordinary Time Earnings rather than WPI) is almost equal to the growth in labour productivity (1.55% per annum) plus CPI inflation (2.9% per annum),[32] which suggests that this relationship holds in practice.

47. However, it is a mistake to apply this logic at the level of any individual industry. Beyond productivity, industry-level wages will be determined by the supply and demand for labour, which will in turn be affected by the movement of labour between industries in response to changes in wages.

48. Take, for sake of illustration, the hairdressing industry. Hairdressers' productivity has likely not increased materially in the last 50 years; save for minor advancements to electric razors, hairdressers are still using the same equipment they were using 50 years ago. However, real

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[31] AER (2015), Attachment 7, page 7-54.

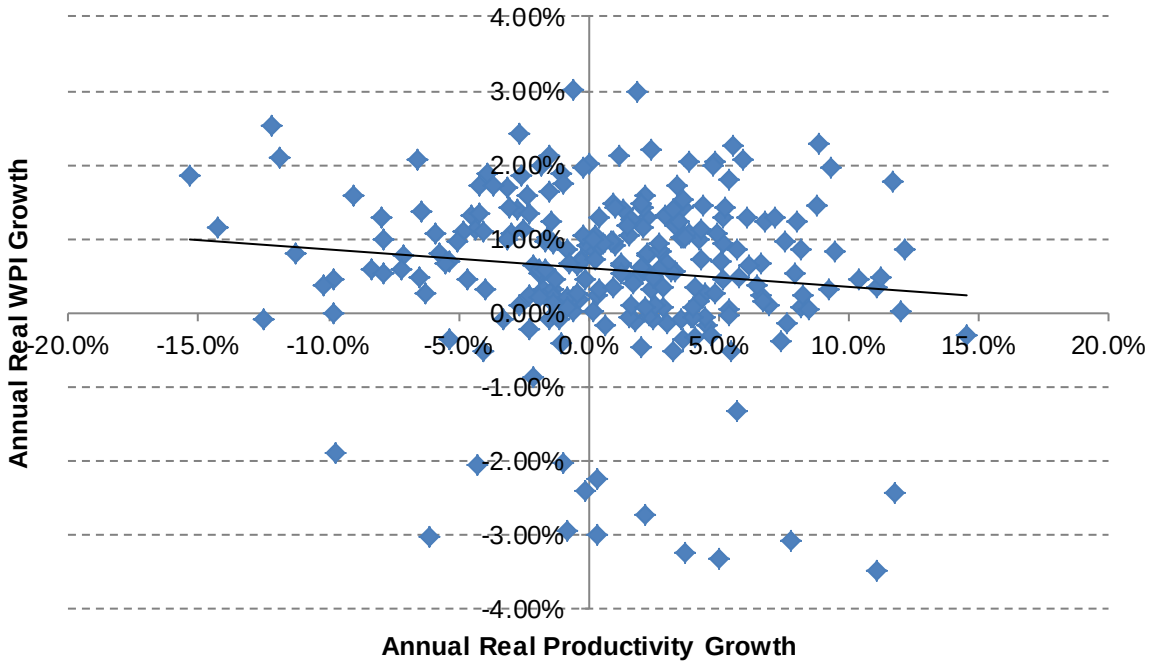
[32] Borland, J. (2012): *Labour cost escalation: choosing between AWOTE and LPI*, March 2012, page 6.

wages for hairdressers have likely increased substantially over that time period. This is because real wages in competing industries have increased, and in order for hairdressers to be willing to remain in or enter that profession, their wages have had to keep pace with those available from the alternatives.

49. The following example illustrates this point using empirical analysis that demonstrates productivity growth and wage growth are not positively correlated at the industry level. The Australian Bureau of Statistics ("ABS") publishes WPIs for 18 different industries (including the EGWWS industry). The ABS also publishes data on labour productivity (real gross value added per quality hour worked) for 15 of those industries. After deflating WPI growth by inflation to obtain real wage inflation, I compare industry-specific wage growth rates with contemporaneous productivity growth rates in the same industries.

50. Although it is not explicitly defined, the AER's implied hypothesis is that wage growth and productivity growth have a strong positive correlation at the industry level. By comparing each year's industry-specific wage growth with its industry-specific productivity growth on a scatterplot, as I have done below in Figure 3.1, I conclude that there is no evidence that this correlation holds at the industry level, at least on a contemporaneous or short-run basis.

Figure 3.1
Contemporaneous Relationship Between Productivity and Wage Growth

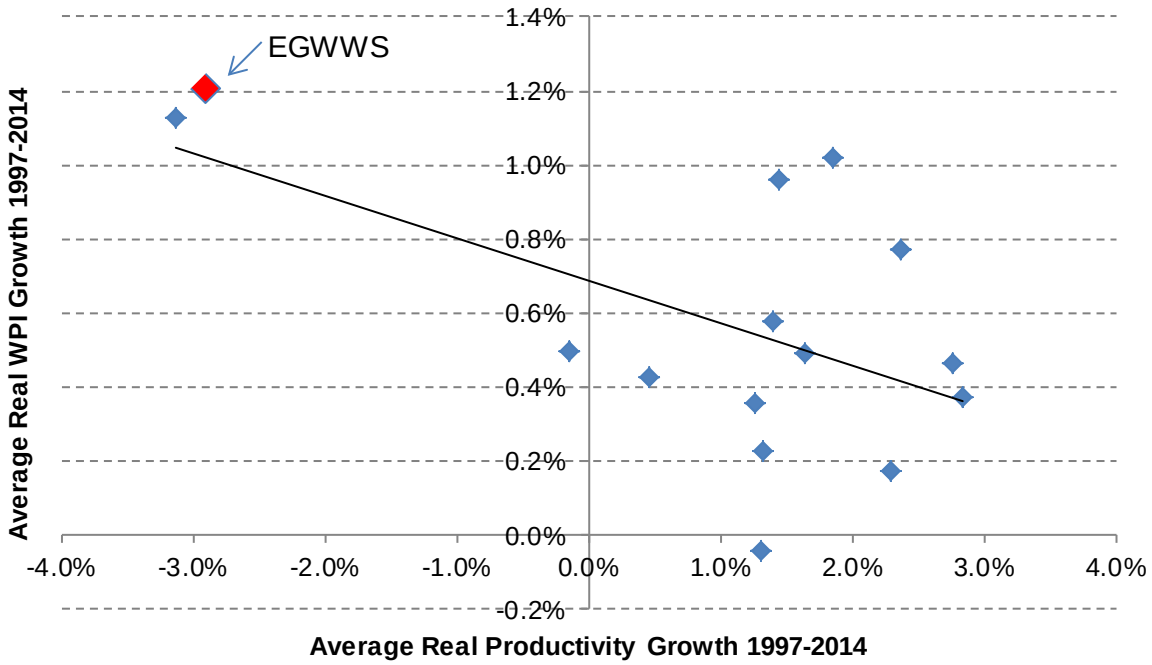


Source: ABS, NERA analysis

51. Of course, there are frictions in wage growth, and productivity growth data is volatile, which means the comparison in Figure 3.1 may not highlight a relationship between industry-

specific wage growth and industry-specific productivity improvement, even if such a relationship did exist. I also note that the AER claims that this relationship holds "*over the long term*".[33] However, when compared over an extended period of time, as I show in Figure 3.2 that compares long-term average growth rates (1997 to 2014) in wages and productivity across a range of industries, I also observe no positive correlation.

Figure 3.2
Long-term Relationship Between Productivity and Wage Growth



Source: ABS, NERA analysis

52. These long-term trends do not support the conclusion that real wage growth and real productivity growth are strongly correlated *at the industry level*. In particular, wages in the most relevant sector to the AER's current decision (EGWWS) have risen much faster than productivity, which has fallen on average over the period.

53. This suggests that, even if there is a strong relationship between labour productivity and real wage growth in the economy as a whole, the relationship breaks down at the level of individual industries. Hence, there is no basis for the AER's assertion that projecting a higher level of wage inflation for DNSPs, such as through using EAs rather than the DAE forecast of EGWWS wages, is inconsistent with an assumption of zero productivity growth over a particular control period.

54. In short, industry-level wage growth rates are driven by a wide range of other factors. Even in the long run there is no reason to expect that wage growth in a particular industry should be strongly correlated with productivity growth in that industry. Hence, the AER's suggestion

[33] AER (2015), Attachment 7, page 54.

that forecasting higher wage growth than DAE's projection would be inconsistent with a zero productivity improvement is therefore not supported by either economic theory or empirical evidence.

55. In fact, the AER's preliminary determination of zero productivity growth in the electricity distribution industry may exaggerate the potential for future productivity improvement, given the long-term trend of *reductions* in productivity in the sector. As described in Attachment 7 of the AER's Preliminary Decision for SA Power Networks, this result is caused by a range of factors, including more stringent safety and quality of service requirements that are not controlled for in the measures of output used in the AER's estimation of productivity trends.[34] This period of reduction in productivity has, moreover, coincided with a period of real wage growth as Figure 3.2 demonstrates.

56. The AER claims that "*since our rate of change approach is holistic, we cannot make a change to one component without considering the impact on other rate of change components*".[35] However, the AER's forecast of zero productivity growth is a qualitative assessment based on (i) negative historic productivity growth for DNSPs and (ii) positive historic productivity growth for related industries.[36] The AER's historic productivity analysis depends on its assumptions on input price growth, where DNSPs with higher input price growth rates appear to be more productive, all else held equal.

57. Despite a steady increase in input prices over the eight-year period it analyses, the AER's analysis shows that DNSPs' productivity has decreased. In fact, input prices would have to have increased considerably more quickly, by 1.96% per annum more than in reality, for the AER to have identified positive productivity growth. Therefore, even if the AER had assumed a significantly higher historical wage growth, based on SA Power Networks' forecast wage growth, it would still have found negative productivity growth over the historic period. And, importantly, since the AER's productivity forecast is a qualitative rather than quantitative assessment, a higher labour price growth should not necessarily feed into the productivity forecast.

3.1.4. Wage growth may be driven by unions' strong bargaining power

58. As described in Chapter 2, some organisations argued that SA Power Networks' forecast for wage growth based on its EA was unreasonably high and did not reflect market conditions. However, this can be at least partially explained by inherent differences between the labour market in the electricity sector as compared to other sectors.

59. In particular, as noted by Mr Catanzariti from the law firm DLA Piper Australia, the ETU "*has very high levels of union membership amongst employees of electrical contractors. This provides the ETU with a virtual monopoly over electrical employee labour supply which*

[34] AER (2015), Attachment 7, page 66.

[35] AER (2015), Attachment 7, page 54.

[36] AER (2015), Attachment 7, page 65.

allows it to extract, not only higher wages, but better terms and conditions than in many other industries".[37]

3.2. Transparency of the AER's Forecast

60. The DAE report, on which the AER's forecast of the EGWWS index is based, lacks transparency. As noted in Section 2.3, DAE's report explains that its forecast comes from its proprietary labour cost model, linked to its macroeconomic model, but macroeconomic modelling of this sort entails numerous assumptions and methodological choices, which DAE has not divulged, in order to protect its intellectual property. The absence of a detailed description of how it produced its forecast means that DNSPs cannot scrutinise this work. Thus, in choosing DAE's index as the basis for its labour price growth forecast, the AER is sidestepping its obligations to demonstrate that it is providing DNSPs with *"a reasonable opportunity to recover at least the efficient costs"*, as specified in Section 7A of the NEL and "*the costs that a prudent operator would require to achieve the operating expenditure objectives*" as required under the NER.[38]

61. The lack of transparency in DAE's EGWWS forecasts has been noted elsewhere. For example, in the context of the 2012 regulatory review of Victorian gas networks for which DAE advised the AER, BIS Shrapnel submitted on behalf of three gas networks that "*as insufficient detail is provided by* [DAE] *on its underlying methodology for the construction of the composite index, we cannot replicate* [DAE]*'s labour productivity forecasts*".[39] On behalf of one of those networks, Professor Jeff Borland submitted that DAE's "*method for forecasting remains a 'black box'.*"[40] In response, DAE claimed that revealing specifics "*would be akin to placing our models (which represent confidential intellectual property) into the public domain*".[41]

62. The AER has recently reaffirmed that DAE is not willing to make public more details on its approach and assumptions.[42] The AER could rectify this problem by using EAs to forecast SA Power Networks' labour costs, for which a more transparent forecast has been produced by Frontier. In contrast to the input assumptions used in DAE's EGWWS forecasting model, the EA data used to construct Frontier's forecast is publically available. Furthermore, as noted in Section 3.1, EAs are demonstrably linked to the labour costs DNSPs actually face.

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37 Rick Catanzariti (2015), *Enterprise Bargaining Agreements*, 26 March 2015, para. 30.

38 National Electricity Rules, rules 6.5.6 (c) and 6.5.7 (c). Note that I have quoted Clause 6.5.6 (c), which relates to operating expenditure. Clause 6.5.7 (c) is identical except that references to operating expenditure are instead references to capital expenditure.

39 BIS Shrapnel (2011): *Real cost Escalation Forecasts to 2017 –Victoria and New South Wales, prepared for the Victorian Gas Distributors –Envestra Ltd, SP-AUSnet, and Multinet gas Pty Ltd*, page 45.

40 Borland, J. (2012): *Labour Cost Escalation: Choosing Between AWOTE and LPI – Report for Envestra Limited*, unpublished page 17.

41 DAE (2012): *Response to issues raised in the Victorian Gas Access Review*, 29 May 2012, Page 17.

42 AER email to SA Power Networks dated 3 June 2015.

3.3. The Weighting Used in Calculating the Allowed Rate of Change

63. The weighting factor that the AER applies when converting its forecast of labour costs to an allowed rate of change understates the proportion of a DNSP's opex that is attributable to labour. Since the AER only allows for real price growth in the labour component of opex (ie. it assumes that non-labour opex grows in line with CPI), underestimating the share of labour in a DNSP's opex will, in turn, result in an expenditure allowance that is insufficient to recover growing labour costs. It is therefore inconsistent with the AER's obligation to ensure DNSPs have "reasonable opportunity" to recover *at least* their efficient costs, as specified in Section 7A of the NEL and to accept a forecast that reflects the efficient and realistic costs a DNSP expects prudently to incur to achieve the operating (and capital) expenditure criteria, required under the NER.

64. The AER adopted a 62 per cent weighting for labour price growth and a 38 per cent weighting for non-labour price growth. The AER states that it "*based these weightings on Economic Insights' benchmarking analysis*".[43] The assumptions used in Economic Insights' benchmarking analysis are, in turn, based on PEG's analysis of Victorian electricity DNSPs' regulatory accounts data from 2003.[44] PEG's analysis breaks DNSPs' costs down into a number of categories, and assigns a published price index to each sub-component of cost. These cost categories are listed in Table 3.1 below, along with their corresponding indices.

Table 3.1
PEG's Mapping of O&M Cost Category to ABS Price Index

O&M Cost Category	ABS Price Index
Meter data services	Producer price index (PPI) computer services
Billing and revenue collection	PPI computer services
Advertising/marketing	PPI advertising services
Customer service	PPI secretarial services
Regulatory	PPI legal services
Other operating	PPI business services
SCADA maintenance	PPI computer services
Network operating costs	Labor cost index
All other maintenance costs	Labor cost index

Source: Pacific Economics Group

[43] AER (2015), Attachment 7, page 58.

[44] Pacific Economics Group (PEG) (2004), *TFP Research for Victoria's Power Distribution Industry*, Report prepared for the Essential Services Commission, Madison.

65. As the above table shows, the ABS labour cost index is only applied to a small number of cost categories. PEG assigns PPIs for the others. The 62% weighting applied to labour price growth in the AER's rate of change analysis reflects the share of the Victorian DNSPs' Operating and Maintenance (O&M) costs covered by the labour cost index, according to the above mapping.

66. Thus the AER's weightings are based on the assumption that all cost categories that are not covered by the ABS labour price index in PEG's mapping are "non-labour." The fact that PEG did not assign these categories to the ABS labour index does not mean that it regarded these as non-labour costs. Rather, there are more focused ABS price indices that, in PEG's view, better reflect expenditure in these cost categories than the labour index, which covers a broad range of activities. In reality, these other cost categories still include labour costs which are relevant to the electricity sector and should not be assumed to move in line with CPI.

67. As evidence of this, SA Power Networks' own operating costs are around 90% comprised of labour.[45] This is materially larger than the AER's estimate. Since even under PEG's 2003 analysis, the share of labour is greater than 62%, it would be appropriate for the AER to apply its estimate of labour cost inflation to the generality of labour costs, rather than just the subset of these costs that happen to be covered by the ABS labour cost index in PEG's analysis. Because the virtual totality of SA Power Networks' operating costs are labour, not just the 62% assumed by the AER decision, the weighting the AER applies to this forecast in setting the allowed rate of change should be increased materially.

68. The AER also argued that "*if SA Power Networks were to include the labour price growth for its contracted services it would also have to include the productivity gains for its contracted workers in its productivity growth forecast*".[46] However, even if the AER updated its productivity analysis to assume that input price growth was solely driven by labour price growth, it would still see negative productivity growth over the historic period. Given the qualitative nature of its productivity assumption, discussed above, there is no reason for this change to feed into a different productivity forecast.

69. Therefore, by taking an approach which materially underestimates SA Power Networks' opex labour share, the AER has failed in its obligation under the NEL to allow DNSPs to recover at least their efficient costs and under the NER to accept a forecast that reflects the efficient and realistic costs a prudent DNSP would incur to achieve the operating (and capital) expenditure criteria.

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[45] SA Power Networks submits that 43.8% of its opex is based on labour costs while 54.1% is based on contracted construction and labour services. The vast majority of this latter category is also based on labour costs.

AER (2015), Attachment 7, page 58.

[46] AER (2015): Attachment 7, page 59.

4. Conclusion

70. As I have described in the body of this statement, the AER's methodology for setting SA Power Networks' allowance for input price escalation materially and systematically underestimates the rates of change DNSPs are likely to face in reality because it has used an inappropriate measure of labour cost inflation and has applied that estimate to too small a proportion of DNSPs' costs.

71. SA Power Networks' proposal of using its own EA, and then the Frontier Economics' forecast of future EAs from its comparator group better reflects the labour costs SA Power Networks will actually face. Contrary to the AER's assertions, the EAs do actually reflect a large proportion of DNSPs' in-house labour, and, in fact, some of DNSPs' outsourced labour. Furthermore, data from the ABS suggests that, contrary to the AER's suggestion, the industry-level link between productivity and wage growth is tenuous at best, and provides no reason to discard the usage of DNSPs' EAs for setting labour cost growth rates.

72. The AER's proposed methodology is to use DAE's forecast of EGWWS wage growth in South Australia. This is flawed for two reasons. First, the DAE model is opaque and is not available to be critiqued by DNSPs on its merits. Second, the EGWWS data includes many employees who are not relevant to DNSPs' costs.

73. Furthermore, the AER has applied its labour growth rate to too small of a proportion of DNSPs' input costs. The AER relies on data that is outdated, and SA Power Networks' regulatory proposal suggests that its share of labour is substantially higher than the AER assumed. The reason for this error seems to be the AER's misinterpretation of data that leads it incorrectly to conclude that 38% of opex is classified as "non-labour". In fact, statements in the AER's Preliminary Decision suggest that around 90% of SA Power Networks' operating costs are labour costs. SA Power Networks' regulatory proposal would therefore provide a more reliable basis for setting cost weightings than the PEG report upon which the AER has relied to date.

74. In summary, therefore, and following my instructions appended in Appendix A, I conclude that the AER's approach to estimating labour price growth does not result in forecasts which achieve the opex and capex criteria, having regard to the opex and capex factors. In particular, due to shortcomings in its estimation of future input price growth, the AER's opex and capex forecasts do not reflect "*the costs that a prudent operator would require to achieve the operating expenditure objectives*" of running an effective network as required under the NER.[47]

75. The AER's opex and capex forecasts do not ensure that DNSPs are "*provided with a reasonable opportunity to recover at least the efficient costs*", as set out in the NEL.

[47] National Electricity Rules, rules 6.5.6 (c) and 6.5.7 (c). Note that I have quoted Clause 6.5.6 (c), which relates to operating expenditure. Clause 6.5.7 (c) is identical except that references to operating expenditure are instead references to capital expenditure.

76. Finally, I find that the AER's approach is not likely to contribute to the NEO of "*promot[ing] efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity*".[48]

[48] National Electricity (South Australia) Act 1996, para. 7, page 38

Appendix A. Instructions

4 June 2015

Mr Richard Druce
NERA UK Limited
By email: Richard.Druce@nera.com

Dear Richard

Expert report on estimating labour price growth

CitiPower Pty, Powercor Australia Ltd and SA Power Networks (**Businesses**) are electricity distribution network service providers (**DNSPs**) in the states of Victoria and South Australia in Australia, subject to economic regulation by the Australian Energy Regulator (**AER**) under the National Electricity Law (**NEL**) and National Electricity Rules (**NER**).

The AER is required to make distribution determinations in respect of regulatory proposals put forward by the Businesses, which determine the revenues that each of the Businesses should be allowed to recover in future regulatory control periods. SA Power Networks submitted a regulatory proposal for the 2015–16 to 2019–20 regulatory control period on 31 October 2014. CitiPower and Powercor Australia submitted regulatory proposals for the 2016 to 2020 regulatory control period on 30 April 2015. The AER made a preliminary decision regarding SA Power Networks' regulatory proposal on 30 April 2015 (**Preliminary Decision**). No decision has yet been made regarding CitiPower or Powercor Australia's regulatory proposals.

The Businesses would like to engage NERA UK Limited (**NERA**) to provide an expert report on the AER's approach to estimating labour price growth in the Preliminary Decision, which addresses the matters set out in the scope of work contained in this letter.

Preliminary Decision

The AER uses labour price growth estimates in forecasting the expected rate of change in operating expenditure (**opex**) and capital expenditure (**capex**) in the forthcoming regulatory control period.

The AER describes its approach to estimating labour price growth in Appendix B to *Attachment 7 - Operating expenditure* of the Preliminary Decision. The AER outlines the use it makes of these growth forecasts in determining operating expenditure (**opex**) in that same Appendix.

The AER outlines the use it makes of the growth forecasts in determining capital expenditure (**capex**) in Appendix D to *Attachment 6 – Capital expenditure of the Preliminary Decision.*

Requirements of the NEL and the NER

In performing or exercising economic regulatory functions or powers (including in making distribution determinations), section 16(1)(a) of the NEL provides that the AER must do so in a manner that will or is likely to contribute to the achievement of the national electricity objective (**NEO**). The NEO is set out in section 7 of the NEL as follows:

> The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

If the AER is making a reviewable regulatory decision (including a distribution determination) and there are two or more possible reviewable regulatory decisions that will or are likely to contribute to the achievement of the NEO, section 16(1)(d) of the NEL provides that the AER must make the decision it is satisfied will or is likely to contribute to the NEO to the greatest degree.

In addition, section 16(2) of the NEL provides that in exercising a discretion in making those parts of a distribution determination relating to direct control services, the AER take into account the revenue and pricing principles set out in section 7A of the NEL (**RPPs**).

Chapter 6 of the NER governs the economic regulation of distribution services and sets out the process by which distribution determinations are made. Clause 6.4.3 of the NER provides that the annual revenue requirement of DNSPs for each year of a regulatory control period must be determined using a building block approach, under which the building blocks include:

a. forecast opex for that year;

b. a return on capital for that year; and

c. indexation of the regulatory asset base.

During a regulatory control period, the regulatory asset base values (and thus the return on capital and indexation of the regulatory asset base building blocks) are increased during the regulatory control period by reference to allowed capex forecasts.

Clause 6.5.6(a) of the NER provides that a building block proposal must include the total forecast opex for the relevant regulatory control period which the DNSP considers is required in order to achieve each of the operating expenditure objectives (set out in that provision) (**opex objectives**).

Clause 6.5.6(c) provides that the AER must accept the forecast of required opex if it is satisfied that the total forecast opex for the regulatory control period reasonably reflects the following:

a. the efficient costs of achieving the opex objectives;

b. the costs that a prudent operator would require to achieve the opex objectives; and

c. a realistic expectation of the demand forecast and cost inputs required to achieve the opex objectives (**opex criteria**).

In deciding whether it is so satisfied, the AER must have regard to the operating expenditure factors set out in clause 6.5.6(e) of the NER (**opex factors**). If the AER does not accept the proposed opex forecast, the AER must estimate the opex that the AER is satisfied reasonably reflects the opex criteria, taking into account the opex factors (see clause 6.12.1(4) of the NER).

Analogous provisions in respect of capex are set out in clauses 6.5.7 and 6.12.1(3) of the NER.

Scope of work

We request that you prepare an expert report that addresses the following:

a. Does the AER's approach to estimating labour price growth (used to determine a forecast rate of change that is applied to a base year opex) in the Preliminary Decision result in opex forecasts required to achieve each of the opex criteria, having regard to the opex factors?

b. Does the AER's approach to estimating labour price growth (used for the purposes of forecasting capex) in the Preliminary Decision result in capex forecasts required to achieve each of the capital expenditure criteria, having regard to the capital expenditure factors?

c. In estimating labour price growth in the Preliminary Decision, has the AER done so in a manner that will or is likely to contribute to the NEO, taking into account the RPPs?

In addressing the above questions, we request you consider the AER's:

a. rationale for rejecting the use of enterprise bargaining agreements as a basis for forecasting labour price escalation;

b. rationale for preferring forecasts of the Electricity Gas Water Waste services (**EGWW**) Wage Price Index (**WPI**);

c. reliance on Deloitte Access Economics' forecasts of the EGWW WPI;

d. statements in relation to labour price escalation and productivity; and

e. choice of weightings between labour and non-labour components of operating expenditure;

and any other matters you consider relevant.

For the purposes of undertaking this work, the Businesses will provide you with a copy of the documents listed in Attachment A. A list of the documents the Businesses have provided to you, and any additional documents relied on by NERA in preparing the report, should be included in the report. A copy of any documents included in the list that were not provided to NERA by the Businesses should be provided to the Businesses with the report.

Expert witness

Included as Attachment B to this letter is a copy of *Practice Note CM7: Expert Witnesses in Proceedings in the Federal Court of Australia*, 4 June 2013. The Businesses request that your report complies with the requirements of Practice Note CM7, and that you certify in your report that you have complied with Practice Note CM7.

The Businesses request that you attach to the report a copy of this engagement letter and a copy of the CVs of the authors, which contain all qualifications and relevant experience.

Timing

The Businesses request that NERA produce its report by no later than Friday 12 June 2015.

Yours sincerely

Brent Cleeve
General Manager Regulation
on behalf of CitiPower, Powercor Australia and SA Power Networks

Attachment A: Documents provided to NERA

AER, Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline, November 2013

AER, Electricity distribution network service providers, Annual benchmarking report November 2014

AER, Preliminary Decision, SA Power Networks determination 2015–16 to 2019–20, Attachment 6 – Capital expenditure, April 2015

AER, Preliminary Decision, SA Power Networks determination 2015–16 to 2019–20, Attachment 7 – Operating expenditure, April 2015

AER - Preliminary decision SAPN distribution determination - Opex model - April 2015.xlsm

CitiPower, Regulatory Proposal 2016-2020, 30 April 2015

Deloitte Access Economics, Forecast growth in labour costs in NEM regions of Australia, Report prepared for the AER, 23 February 2015

DLA Piper, Enterprise Bargaining Agreements, 26 March 2015

Economic Insights, Economic benchmarking assessment of Operating expenditure for NSW and ACT distributors, November 2014

Fair Work Commission, Powercor Australia Ltd CitiPower Pty and CEPU Enterprise Agreement 2013 - 2016, 7 October 2014

Pacific Economic Group, TFP Research for Victoria's Power Distribution Industry, December 2004

Powercor Australia, Regulatory Proposal 2016-2020, 30 April 2015

SA Power Networks, Regulatory Proposal 2015/16 to 2019/20

SA Power Networks, AER SAPN 014 – Labour cost escalations.pdf

Utilities Management Pty Ltd Enterprise Agreement 2014

Links to:
AER, Preliminary Decision, Ergon determination 2015–16 to 2019–20
AER, Preliminary Decision, Energex determination 2015–16 to 2019–20
AER,Final decision, AusGrid determination 2015-16 to 2018-19
AER, Final decision, Endeavour determination 2015-16 to 2018-19
AER, Final decision, Essential determination 2015-16 to 2018-19
AER, Final decision, ActeAGL determination 2015-16 to 2018-19

Attachment B: ***Practice Note CM7: Expert Witnesses in Proceedings in the Federal Court of Australia***

Appendix B. Curriculum Vitae

Richard Druce

Senior Consultant

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Overview

Mr Druce advises clients, including utilities, regulators, governments and financial investors on matters related to the economic analysis of gas and electricity markets, and the regulation of gas and electricity network companies. In particular, he has advised a range of companies on matters related to the assessment of costs by regulators at periodic reviews of their price or revenue controls, including EDF Energy Networks, Wales and West Utilities, Thames Water, PowerNI, NIE Power Procurement Business, Fluxys, ENBW, and London Underground Limited.

Mr Druce holds an MPhil degree in Economics from St Catharine's College, Cambridge. He also holds a first class degree in Economics and Econometrics from the University of Bristol. Before joining NERA, he worked at the UK Office of Rail Regulation.

Qualifications

2005-2006	**ST CATHARINE'S COLLEGE, CAMBRIDGE** MPhil Economics
2002-2005	**UNIVERSITY OF BRISTOL** BSc Economics and Econometrics

Career Details

2006-Present	**NERA ECONOMIC CONSULTING** Senior Consultant (2012-), London Consultant (2009-12), London Analyst (2006-09), London
Summer 2004 & Summer 2005	**OFFICE OF RAIL REGULATION** Temporary Assistant Economist

Project Experience

2015

- For the UK Energy Networks Association (DCRP P2 Working Group), advising on potential changes to Engineering Recommendation P2/6, the design standard that governs the investments that British electricity distributors are obliged to make in their networks to ensure security of supply.
- For the UK Committee on Climate Change, in collaboration with Imperial College London, analysing the marginal system integration cost associated with the connection of increased volumes of intermittent and other low carbon generation technologies onto the British power system.
- For UK Power Networks (with SP Energy Networks, Electricity North West and Northern Power Grid), advice in the course of the appeal to the Competition and Markets Authority of Ofgem's "RIIO-ED1" price control decision by British Gas Trading Limited.
- For UK Power Networks, advice in the course of the appeal to the Competition and Markets Authority of Ofgem's "RIIO-ED1" price control decision by Northern Powergrid Limited.
- For a British distribution network operator, advice on the potential case for a CMA referral in the context of Ofgem's Final Determination from the RIIO-ED1 price control review. This project is being conducted in collaboration with Imperial College London and DNV GL.

2014

- For the British electricity Distribution Network Operators (DNO), through the Energy Networks Association, drafting a critique of Ofgem's Draft Determination of the allowance for Real Price Effects over the RIIO-ED1 control period, and forecasting inflation in cost indices using ARIMA methods.
- For Scottish Power Energy Networks (SPEN), in the context of the RIIO-ED1 price control review, providing a range of support related to Ofgem's assessment of efficient costs, including analysis of econometric benchmarking, real input price inflation, and regional and "special" factors.
- For UKPN, support in relation to the outlook for real input price inflation in the context of the RIIO-ED1 price control review.
- For the Singapore Gencos (Tuas Power, Pacific Light Power Corp, Senoko and PowerSeraya), preparing a review and critique of the Energy Market Authority of Singapore's Draft Determination of the Vesting Contract Level for 2015/16.
- For ElecLink, a proposed interconnector between Great Britain and France, designing the auction-based mechanism for allocating long-term capacity rights through an open season.
- For Thames Water, developing a "Special Factor" case as part of the Ofwat Price Review 2014 process, identifying and quantifying factors affecting the company's costs that are not allowed for in the Ofwat cost assessment benchmarking.

- For the Saudi Electric Company (SEC), advice on power sector restructuring issues in the context of the proposed divestment of shares in SEC's generation and distribution assets, and the introduction of more competitive power procurement arrangements, with a particular focus on the design of distribution network regulatory arrangements.
- For RWE npower (in collaboration with Imperial College London), preparing reports in the context of Project TransmiT to (1) compare the long-run marginal cost of transmission investment with the tariffs under alternative charging methodologies, (2) estimate the welfare effects of the WACM2 charging methodology using detailed market and transmission system simulation models, and (3) review an Ofgem consultation paper.
- For the Department of Environment, Food and Rural Affairs (Defra), conducting quality assurance of a Monte Carlo simulation model, and the econometric analysis used to calibrate input assumptions.

2013

- For Western Power Distribution, a UK electricity Distribution Network Operator (DNO), conducting financial risk modelling in the context of Ofgem's RIIO-ED1 price control review.
- For Scottish Power Energy Networks (SPEN), in the context of the RIIO-ED1 price control review, providing a range of support related to Ofgem's assessment of efficient costs, including analysis of econometric benchmarking, real input price inflation, and financial risk modelling.
- For the European Commission (in collaboration with Imperial College London and KEMA), advising on the regulatory, commercial and market arrangements required to efficiently integrate renewables into the European power system. This assignment covered wholesale market design, transmission and distribution grid access and charging arrangements, and renewables subsidy mechanisms.
- For RWE npower (in collaboration with Imperial College London), preparing reports in the context of Project TransmiT to (1) critique the impact assessment published by Ofgem following the Project TransmiT "Significant Code Review", and (2) estimate the welfare effects of the WACM2 charging methodology using detailed market and transmission system simulation models.
- For the Electricity and Cogeneration Regulatory Authority (ECRA) of Saudi Arabia, advising on various aspects of power market design, competition and regulatory issues, including detailed modelling of the KSA power system.
- For a confidential investor, performing regulatory due diligence for the London Array wind farm.
- For a confidential investor, valuation of UK onshore wind farms and a project to convert an existing coal-fired power station into a dedicated biomass generation facility.
- For a confidential client, providing economic analysis relating to changes in the costs of upstream oil and gas production.
- For a confidential investor, valuation of a portfolio of power generation capacity (coal-fired, gas-fired CCGTs, pumped storage and oil-fired peakers).

2012

- For Wessex Water (UK), conducting a 'stated preference' study to assess consumers' willingness to pay for improvements to the quality of water supply and sewerage service using econometric modelling.
- For Bristol Water (UK), conducting a 'stated preference' study to assess consumers' willingness to pay for improvements to the quality of water supply using econometric modelling.
- For the Regulation and Supervision Bureau (Abu Dhabi), advising on the development of cost reflective tariffs for electricity and water supply, including statistical analysis of consumption data to estimate representative consumption profiles using "quantile regression" techniques, and the development of a detailed water and power sector despatch model.
- For the Department of Environment, Food and Rural Affairs (Defra), conducting quality assurance of a Monte Carlo simulation model, and the econometric analysis used to calibrate input assumptions.
- For the UK Office of Rail Regulation (ORR), analysing the impact of an increase in rail freight access charges on the demand for coal from the Electricity Supply Industry using a model of the wholesale electricity market.
- For a major UK utility, reviewing Ofgem's proposals to implement "mandatory auctions" for the sale of electricity generated by the "big 6" utilities operating in the British market.
- For The Department for Energy and Climate Change (DECC), providing analysis of the long-term "balancing challenge" driven by the integration of intermittent renewables and the electrification of the heat and transport sectors.
- For RWE npower (in collaboration with Imperial College London), review of Ofgem proposals to amend Transmission Network Use of System (TNUoS) charges following Project TransmiT to better reflect the costs imposed on the transmission system by intermittent renewable power generators.
- For the Omani Power and Water Procurement Company (OPWP), advising on contractual, regulatory and market issues associated with the renegotiation of power and water purchase agreements (PWPAs).
- For an Irish utility, providing an independent review of the company's 5-year business plan (electricity generation, wholesale trading, renewables and retail businesses) in support of a potential refinancing.
- For a confidential investor, valuation of a portfolio of power generation capacity (coal-fired, gas-fired CCGTs, pumped storage and oil-fired peakers).

2011

- For a NW European gas trading company, providing economic advice regarding the appropriateness of the tariff charged for accessing a gas pipeline.

- For Power NI, providing regulatory advice and quantitative analysis (Monte Carlo simulation of cash balances) to estimate the margin required over the upcoming control period.
- For an Irish utility, providing an independent review of the company's 5-year business plan (electricity generation, wholesale trading, renewables and retail businesses) in support of a potential refinancing.
- For ScottishPower, modelling the impact of the UK government's Electricity Market Reform (EMR) proposals, including analysing the impact of the CO2 price floor and a targeted capacity mechanism.
- For RWE npower, in collaboration with Imperial College London, electricity market modelling work to compare the welfare effects of locational Transmission Network Use of System (TNUoS) charges with a uniform tariff.
- For a confidential investor, valuation of a portfolio of UK generation assets including gas and coal capacity, pumped storage and oil-fired peaking plant.
- For a confidential investor, valuation of UK gas-fired generators in support of a proposed transaction.
- For a confidential investor, conducting market due diligence for a proposed new nuclear power plant in the Bulgarian market, including long-term power price forecasting out to 2050.
- For NIE Energy Power Procurement Business, conducting bottom-up Monte Carlo modelling to assess the risks to which the company is exposed, and so estimate the margin required by the company through its price control.
- For NIE Energy Supply, advising on possible contract structures for the procurement of energy from renewable generators.

2010

- For a confidential investor, power price forecasting and market analysis in the South Korean power market, including detailed analysis of Asian and world gas markets with focus on the Asian LNG spot market.
- For the Ministry of Trade and Industry (Singapore), providing technical and market advise in the course of an appeal by the Singapore "gencos" against a decision by the regulator to reform the vesting contract regime.
- For a large European utility, market analysis and price forecasting in the Polish electricity market, including the assessment of coal-fired generation investments.
- For an investment bank, conducting due diligence on an Irish utility, including a review of the Single Electricity Market and the Irish and Northern Irish electricity retail markets.
- For a large European utility, market modelling work to support generation investment decision making in the UK market.
- For a consortium of investors, market due diligence, including detailed market modelling, for a proposed CCGT investment in the Balkans.

- For a private equity fund, preparing a report on the investment climate for renewable generation in the British market, including forecasting prices in the markets for power and renewables obligation certificates.

2009

- For London Underground Limited, providing ongoing support and advice in the course of the periodic review of the price clause in the PPP agreement with Tubelines Limited, focussing on the potential for future productivity growth and real input price inflation.
- For EDF Energy Networks, providing ongoing support, economic analysis and strategic advice in the course of the British electricity distribution price control review, with focus on benchmarking of costs, forecasting real input price inflation, and analysis of incentive mechanisms.
- For NIE PPB, support during the company's price control review focussing on modelling of working capital requirements.
- For the Department of Energy and Climate Change (DECC), analysing options for a regulatory framework for CO2 transportation infrastructure to enable the deployment of Carbon Capture and Storage technologies in the UK, including analysis of investment incentives under uncertainty about future demand for network infrastructure.
- For confidential investors, conducting market due diligence on UK, Irish and Italian generation assets.
- For BBL Company, advising on proposals for introducing an interruptible reverse flow service on the gas interconnector between the Netherlands and Great Britain.
- For the Lithuanian nuclear development company, market analysis and price forecasting for the Baltic markets and neighbouring European markets (Poland, Nord Pool, etc.), as an input to decision-making on a new nuclear plant in Lithuania.
- For a confidential client, support in preparation for a potential arbitration over the price clause in a gas supply agreement, reviewing the operation of gas markets in Britain and Belgium, and conducting econometric analysis of gas price series.
- For the International Finance Corporation, preparing a market report on the West African Power Pool (Ghana, Côte d'Ivoire, Benin and Togo), including wholesale electricity market modelling to establish optimal generation investment strategies.
- For a Turkish investor, modelling the evolution of the Turkish power market under a range of scenarios.

2008

- For EDF Energy Networks, forecasting future real input price inflation for the network business to support a submission to the industry regulator during distribution price control review.
- For Wales and West Utilities, helping to design an auction for "interruption rights" on their network, to ensure that the auction meets regulatory planning requirements, and advising on the design of a bid selection algorithm.

- For a grouping of Singaporean generators, reviewing the energy regulator's proposals on vesting contracts, including a review of the regulators' estimate of the long-run marginal cost of electricity generation and the level of vesting contract coverage required to mitigate market power.
- For PowerGas (Singapore), support in designing a regulatory framework for a proposed LNG terminal, including financial modelling and drafting regulatory proposals to the industry regulator for the calculation of allowed costs and tariffs.
- For a utility investor, market due diligence and revenue forecasting in support of the client's bid to acquire one of the state-owned Singaporean gencos that were being sold in 2008.
- For an investment bank, preparing detailed electricity market reports on the Romanian, Bulgarian and Polish electricity markets, including wholesale power price forecasts and a comparison of renewables investment incentives across the markets.
- For DEPA (Public Gas Corporation of Greece), reviewing the draft gas transmission network code for the Greek gas transmission system, with a focus on gas balancing, as well as transmission and LNG terminal access arrangements.
- For the Australian Energy Market Commission, writing a factual report, reviewing the arrangements that have been adopted in relation to Advanced Metering Infrastructure (AMI) in Great Britain.
- For ENBW, reviewing and appraising a regulatory benchmarking study of international electricity transmission system operators.
- For a confidential client, forecasting power prices for the Polish electricity market.
- For EOS, undertaking market due diligence and revenue forecasting for the generation capacity owned by EOS and Atel in Europe (including storage hydro, pumped storage, run-of-river, nuclear, and fossil-fuel plants in Switzerland, France, Germany, Italy, Hungary and Czech Republic).
- For a confidential asset management firm, preparing a review of the Russian electricity sector, focussing on the reform of the regulatory system for electricity distribution networks to introduce "RAB regulation".
- For confidential clients, advising on potential energy sector merger transactions.

2007

- For an investment bank, conducting due diligence on an Irish utility, including a review of the Single Electricity Market and the Irish and Northern Irish electricity retail markets.
- For E.ON UK Limited, providing support in its appeal to the UK Competition Commission against proposals to modify the gas uniform network code approved by the Gas and Electricity Markets Authority.
- For an independent power producer in the UK, preparing a report on the investment climate for renewable generation in the British market.

- For a UK electricity market investor, advising regarding investment strategies in the British electricity industry, including a description of the nature of electricity retail market competition.
- For Rede Electrica Nacional (Portuguese transmission network operator), designing an alternative regulatory system, containing incentives for cost minimisation, including financial modelling of the effects from the proposed system.
- For Fluxys, reviewing a benchmarking study undertaken at the request of the industry regulator to inform its "x-factor" decision.
- For National Grid Company, supporting an application to the EC for exemption from the Utilities Contracts Regulations, involving extensive research on European gas and electricity transmission and distribution networks.
- For the Regulation and Supervision Bureau, Abu Dhabi, modelling the electricity and water sectors to determine the least cost means of meeting electricity and water demand in Abu Dhabi over a 15-year horizon, using NERA's EESyM model.
- For Wales and West Utilities, providing economic advice during the periodic price control review, with focus on the benchmarking of operational expenditure.
- For Gas Transport Services, a review of different cost accounting methodologies, including a review of regulatory practice in other European countries.
- For an investment bank, conducting due diligence on a British electricity distribution network, including a review of the regulatory risks that the company faces.
- For a large European utility, preparing training materials regarding the structure of the British gas and electricity markets (including retail market competition and a review of regulatory policy debates).
- For a confidential client, valuing of a portfolio of EU Emissions Trading Scheme CO2 allowances, for support in litigation.
- For the Office of Rail Regulation, modelling the impact of altering rail freight track access charges on the UK wholesale electricity market using NERA's EESyM model.
- For Nuon and Essent, advising on a potential merger, in particular on consequences for the Dutch electricity market, involving modelling of Supply Function Equilibria.

2006

- For EDF Energy Networks, advising on the scope for distributed generation in the London electricity market.
- For The Gas Forum, advising on proposed reforms of the charging structure for gas transmission exit capacity in the UK, involving a cost benefit analysis of the proposed reforms and an analysis of the economics of gas pipeline capacity.
- For a grouping of Singaporean generators, reviewing the energy regulator's proposals on vesting contracts to control market power.
- For a confidential client, advising on the competition effects of mergers on British energy markets.

- For a large European utility, conducting market due diligence and revenue forecasting for a gas storage asset in the Netherlands.

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