Response to submissions on the relevance of the TransGrid sale

REPORT PREPARED FOR JEMENA ELECTRICITY NETWORKS, ACTEWAGL DISTRIBUTION, AND UNITED ENERGY

February 2016

Response to submissions on the relevance of the TransGrid sale

1 Executive Summary

1.1 Context

1 Frontier Economics (**Frontier**) has been retained by Jemena Electricity Networks, ActewAGL Distribution, and United Energy (**the networks**) to respond to a recent submission relating to the recent sale of a 99-year lease interest in TransGrid, the NSW electricity transmission network owner and operator. It has been submitted by the Victorian Energy Consumer and User Alliance (**VECUA**), in a submission to the Australian Energy Regulator (**AER**) dated 6 January 2016, that the outcome of this sale process is relevant to the AER's determination on the allowed return on equity for the networks. A similar submission was made by Public Interest Advocacy Centre (**PIAC**), in a submission to the Australian Competition Tribunal dated 26 August 2015, in the context of merits review applications before the Tribunal relating to the AER's determinations for the NSW electricity distribution businesses.

2 Both submissions note that the State of NSW has recently conducted a process to sell (or was in the process of selling) a special purpose vehicle that has now been granted a 99-year lease over the assets of the NSW transmission network business, TransGrid (the TransGrid sale process).

3 The PIAC submission, which was made before the final sale price was known, notes that the sale process has attracted the interest of a number of consortiums, some members of which have ownership interests in other regulated electricity networks in Australia. PIAC have submitted that this interest in the TransGrid sale process implies that the AER's allowed return on equity of 7.1% for the remainder of the current regulatory period is more than adequate.[1]

4 The VECUA submission asserts that the fact that the sale price was in excess of the regulated asset base (**RAB**) implies that the AER's approach to determining the allowed return on equity produces an outcome that is more than adequate.

1.2 Instructions

5 We have been asked to prepare an expert opinion that:

a. Considers and expresses an opinion in relation to the points raised in VECUA's submission on the implications of the TransGrid transaction, including:

i. Why a sale price for a regulated business might differ from the value of its regulated asset base; and

ii. What, if anything, the TransGrid transaction says about the return required by investors.

[1] PIAC submission of 26 August 2015, Paragraphs 58 and following.

6 In preparing the report, we have been asked to:

a. consider any relevant comments raised by the AER and other regulators, experts engaged by those regulators, and other stakeholders; and

b. use robust methods and data in producing any statistical estimates.

7 The terms of reference for this report are attached as Appendix 1 to this report.

1.3 Author

8 This report has been authored by Professor Stephen Gray, Professor of Finance at the UQ Business School, University of Queensland and Director of Frontier Economics, a specialist economics and corporate finance consultancy. I have Honours degrees in Commerce and Law from the University of Queensland and a PhD in Financial Economics from Stanford University. I teach graduate level courses with a focus on cost of capital issues, I have published widely in high-level academic journals, and I have more than 15 years' experience advising regulators, government agencies and regulated businesses on cost of capital issues.

9 I have attached a copy of my CV as Appendix 2 to this report.

10 My opinions set out in this report are based on the specialist knowledge acquired from my training and experience set out above. I have been provided with a copy of the Federal Court's Practice Note CM 7, entitled "Expert Witnesses in Proceedings in the Federal Court of Australia", which comprises the guidelines for expert witnesses in the Federal Court of Australia (Expert Witness Guidelines). I have read, understood and complied with the Expert Witness Guidelines.

1.4 Summary of conclusions

11 Our main conclusion is that the PIAC and VECUA submissions are superficial at best and should be rejected. The fact that the sale price exceeded the regulated asset base (RAB) does not constitute any evidence of the adequacy of the AER's allowed return on equity of 7.1% for the remaining four years of TransGrid's current regulatory period.

12 The reasons for this conclusion include:

a. The sale price reflects not only the allowed return on equity of 7.1% for the next four years, but also:

i. The bidder's expected cash flows over the full 99-year lease period;

ii. The extent to which the bidder considers that it may be able to outperform the regulatory benchmark under

incentive-based regulation or be eligible to receive incentive payments;

iii. The bidder's assessment of the value attributed to non-regulated assets owned by TransGrid;

iv. Growth options – the potential for future growth in the earnings of the firm, arising from:

1. The expansion of existing non-regulated activities;
2. The development of new non-regulated activities;
3. Increasing the scale and/or efficiency of regulated activities;

v. Synergies – an acquirer might be prepared to pay a premium for TransGrid, for instance, because there may be synergies with the acquirer's existing business. Such synergies may not be available to a benchmark efficient service provider;

vi. Diversification benefits – the acquisition of TransGrid may provide a bidder with valuable diversification benefits that may not be available to a benchmark efficient service provider;

vii. Strategic considerations – gaining entry to a particular market might be of strategic importance to an acquirer seeking to establish an operation in a new market or reach an efficient scale in a market where it already has some interests; and

viii. Tax effects – the reported sale price includes stamp duty of over $430 million, and one of the considerations of the bidders would have been the extent to which they may be able to structure the tax position of the company to outperform the efficient regulatory benchmark.

b. Because controlling interests are purchased at a material premium to ordinary equity, the prices paid for controlling interests cannot be used to infer anything about the required return on ordinary equity – even aside from the other reasons set out above. That is, the price that an investor might pay to acquire a controlling interest in a business that operates a network need not reflect the return that the business would require from additional investment in that network; and

c. In its Rate of Return Guideline, the AER acknowledged that RAB multiples cannot be used to infer anything at all about the adequacy or otherwise of its allowed returns – and has not sought to do so in any recent decisions for this reason.

2 The TransGrid sale process

13 TransGrid is 100% owned by the State of NSW. The State announced its intention to sell 100% of the equity in a business that has a 99-year lease over the TransGrid electricity transmission network. In effect, the State proposed to sell the TransGrid assets and the right to operate the NSW transmission network. There is no dispute about these facts.

14 There is also no dispute about the fact that a number of consortiums expressed interest in (effectively) buying TransGrid. Six consortiums were invited to provide indicative bids to the State, and four consortia were invited to provide formal binding bids in November of 2015.

15 There is also no dispute about the fact that the bidder consortiums include a number of businesses that have existing investments in electricity distribution and transmission networks in Australia, or about the price that was ultimately paid for TransGrid.

16 The winning bidder was a consortium that consisted of:

a. SPARK Infrastructure Group, an ASX-listed investment fund specialising in infrastructure networks, 15.01%;

b. Hastings Funds Management, an Australian-based manager of infrastructure assets, 20.02%;

c. CDPQ, a large institutional fund manager based in Quebec Canada, 24.99%;

d. Tawreed Investments Ltd, an infrastructure investment vehicle owned by the Abu Dhabi Investment Authority, 19.99%; and

e. Wren House Infrastructure, an investment vehicle of the Kuwaiti Investment Authority, 19.99%.

17 The winning bid was a total of $10.258 billion, which amounts to an unadjusted multiple of approximately 1.6 relative to TransGrid's RAB.[2]

[2] TransGrid's RAB was $6.242 billion as at 30 June 2015 and will be $6.451 billion as at 30 June 2016.

3 The submissions from user groups

3.1 The VECUA submission

18 The VECUA submission in relation to the TransGrid sale is quite brief and simply points to the fact that the sale price exceeded the RAB:

> In November 2015, the NSW transmission entity was sold (99 year lease) for $10.3 billion – a sale price that amounted to over 160% of its current regulated asset base (RAB) value.
>
> Throughout the recent TransGrid revenue determination process, TransGrid made many assertions that the AER's approach to determining its return on equity allowances would not enable TransGrid to recover efficient financing costs or to attract equity investors – claiming that it would result in lower investment in the network and a significant increase in TransGrid's financing risks.
>
> The extraordinary sale price achieved by TransGrid makes a mockery of those claims.[3]

19 The VECUA submission goes on to point to some investor presentation materials produced by SPARK Infrastructure in relation to the equity capital raising that that firm needed to undertake to partially finance its share of the sale price:

> VECUA refers the AER to the Spark Infrastructure equity investment prospectus, which outlines why investors are willing to pay such a large premium above the networks' book values.[4]

20 However, in my view, the SPARK materials do not support the VECUA submission at all. In fact, they provide a useful summary of why the VECUA submission is ill-conceived and wrong. In setting out some of the reasons why investors might be willing to pay a premium over the RAB, the SPARK materials explain that the buyers are purchasing much more than the regulated cash flows – a material part of the sale price relates to unregulated assets, growth options, efficiency savings, and the value of improved corporate management. Consequently, the observed sale price tells us nothing about the extent to which SPARK or its investors consider the AER's approach to the allowed return on equity to be reasonable. I explain this point in detail in the subsequent section of this report.

3.2 The PIAC submission

21 PIAC presented submissions on the allowed return on equity to the Australian Competition Tribunal (**Tribunal**) on 26 August 2015, prior to the shortlisting of consortiums and well before the TransGrid sale price had been determined. Among PIAC's submissions was the claim that the fact that potential buyers had

---

[3] VECUA Submission, p. 14.

[4] VECUA Submission, p. 14.

displayed interest in the TransGrid sale process implied that the AER's allowed return on equity must be adequate for investors. PIAC's submission was made to the Tribunal as part of a merits review process whereby a number of businesses[5] were seeking a review of the AER's regulatory decision. One of the issues brought before the Tribunal was the AER's approach to determining the allowed return on equity.

22 The PIAC submission noted that the network businesses[6] all submitted that the AER's allowed return on equity of 7.1% was materially below the required return on equity in the prevailing conditions in the market. However, PIAC concluded that such a contention is inconsistent with the observation that a number of consortiums had expressed interest in the TransGrid sale. PIAC summarised the argument as follows:

> Simply put, if the Networks' complaint were well founded, one would not expect to see such strong interest being shown in the competitive tender process for the sale of a long-term lease of the TransGrid network – less still, by five existing shareholders of regulated network business – and even further less still, by an existing transmission and distribution network operator which submits to the Tribunal, on the basis of its experience raising capital in equity markets, that the allowed rate of return is inadequate to attract equity investment.[7]

23 The reference to "an existing transmission and distribution network operator" relates to AusNet Services, which lodged an expression of interest in the TransGrid sale process and which was also a party to the merits review proceedings (an intervener in those proceedings).

24 PIAC concluded on this point that:

> The real world "experimental control" situation presented by the TransGrid sale strongly suggests, at a minimum, that no increase to the return on equity allowance can be justified.[8]

[5] Including the NSW electricity distribution networks Ausgrid, Essential and Endeavour, ActewAGL, and Jemena Gas Networks as applicants and a number of other gas and electricity distribution networks as interveners.

[6] That is, all of the gas and electricity transmission and distribution businesses that were involved in the relevant round of AER determinations.

[7] PIAC submission of 26 August 2015, Paragraph 61.

[8] PIAC submission of 26 August 2015, Paragraph 64.

4 The sale process provides no useful evidence about the required return on equity

4.1 Overview

25 When potential bidders are determining the maximum amount that they would be prepared to pay for a company such as TransGrid, the standard approach is to forecast future expected cash flows and to discount those cash flows back to present value using what the bidder considers to be an appropriate risk-adjusted discount rate.

26 The fact that some potential purchasers may have indicated an interest in the TransGrid sale process provides no information at all about what cash flows they may be forecasting or about what discount rate (or required return) they may be using. One cannot possibly infer from an entity's expression of interest in the sale process that the entity considers an allowed return on equity of 7.1% to be adequate in the current market conditions, or that the entity considers that the AER's approach of varying the allowed return on equity one-for-one with changes in the government bond yield is likely to produce sensible estimates of the required return on equity in all market conditions. In my view, the PIAC submission is implausible – it is clearly impossible to infer, from the mere fact that some interest has been observed in the TransGrid sale process, that investors consider the AER's allowed return on equity to be adequate.

27 Even observing a sale price in excess of the RAB does not imply that investors consider the AER's allowed return on equity to be adequate. This is because bidders will value TransGrid as the sum of the present value of the allowed revenues net of forecasted costs and the present value of other cash flows and benefits (net of costs) over some future period that extends well beyond TransGrid's current regulatory period. Without knowing what cash flows a bidder has forecasted for the allowed revenues or future costs and what has been forecasted in relation to other cash flows and benefits (net of costs), it is impossible to conclude anything about what the sale price implies about the adequacy of the allowed return on equity (given this forms only one component of the regulated cash flows). The VECUA submission implicitly applies the entire sale price to the stream of regulated cash flows and treats all of the other cash flows and benefits as being of no value at all. In my view, such an approach is unreasonable.[9]

28 In the remainder of this section, I consider in more detail what can and cannot be inferred from:

a. observing interest in the TransGrid sale process; and

[9] Based on my first-hand experience as an advisor to one of the syndicates bidding for TransGrid.

b. observing the final sale price relative to the RAB.

4.2 Potential bidders adopt a long horizon, well beyond the current four-year regulatory period

29 Potential bidders will, of course, consider cash flows over the full 99-year lease period, not just the first four-year regulatory period. Whereas the 7.1% allowed return on equity is locked in for the first four years, it certainly need not apply to the subsequent 95 years. Two points are relevant here:

a. If the network businesses are successful in the current merits review process, or if the AER's process for determining the allowed return on equity (or the market data that inputs to it[10]) changes for any other reason, those changes will apply from the end of the current four-year regulatory period. In this regard, we note that 95 of the 99 years of the lease period fall outside the current regulatory period for which the 7.1% allowed return on equity applies; and

b. If the AER's current approach to determining the allowed return on equity is maintained, there will be an "averaging out" over the long-run. Indeed, the basis of the network businesses' claims in relation to the return on equity is that actual required returns in the market for equity funds do not rise and fall one-for-one with changes in the risk-free rate. They contend that the AER should not have reduced its allowed return on equity one-for-one with the recent falls in the risk-free rate – that such a mechanistic approach under-compensates equity investors during periods when government bond yields are low. Of course, the reverse is also true – the same mechanistic approach will tend to over-compensate investors when government bond yields are high. Indeed, one of the key features of the networks' proposed approach for estimating the required return on equity is that it produces more stable estimates than does the AER's approach of adding an essentially fixed premium to the government bond yield of the day. Over a 99-year period, one would expect several cycles of high and low interest rates as financial market conditions ebb and flow.

30 In relation to the merits review, my view is that a rational bidder consortium will have factored potential outcomes into their forecasted cash flows as those outcomes are likely to affect future regulatory decisions for TransGrid.

[10] For example, government bond yields may, over time, revert towards their average levels from their current historical lows.

4.3 Other considerations that will affect bid prices

4.3.1 Overview

31 The allowed return on equity that will apply to the first four years of a 99-year lease period is one of numerous considerations that will affect the price that potential buyers would be willing to pay for TransGrid. As set out above, observing that some parties have expressed some interest in the TransGrid sale process tells us nothing at all about the adequacy of the 7.1% allowed return on equity for the first four years.

32 Even now that the bid price is known, there is still no way to infer anything at all about the adequacy of the 7.1% allowed return on equity over the first four years. This is because there are so many other factors that will affect the value of TransGrid to each potential buyer. It is entirely possible that a potential buyer may bid above the RAB even though they consider the 7.1% return on equity over the first four years to be wholly inadequate – because the allowed return on equity for the first four years is only one factor to consider among many. By analogy, four people attending a house auction may bid above the reserve (RAB) even though none considers the upstairs bathroom (allowed return for the first four years) to be adequate.

33 One of the other considerations is the allowed return on equity for years 5 to 99. As set out above, bidders will consider the extent to which the allowed return on equity may, in the long run, be more reasonable and commensurate with market required returns, or that it may be equally likely to overstate or understate the market required return. Bidders will also have regard to a number of other considerations, which are set out in the remainder of this section.

4.3.2 Incentive regulation

34 Under the National Electricity Rules / National Gas Rules, an incentive-based regulatory framework is used. Under this framework, allowed revenues are based on the efficient costs (including a return on capital) of a benchmark efficient entity – they are not based on the actual costs of the particular firm being regulated. A regulated firm that is able to beat the efficient benchmark will be allowed to keep at least some of the benefits. This is important because it creates a strong incentive for regulated firms to improve their efficiency. No such incentive would exist if the firm's actual costs were simply passed through to customers. As more firms beat the benchmark, the regulator will revise what it considers to be efficient, and the benchmark itself is revised accordingly.

35 Any net outperformance of the regulatory benchmarks will flow through to the firm's equity holders (because the debt holders will be paid what they are contractually due and no more).

36 This incentive-based framework has clear implications for the price that potential purchasers will be prepared to pay for a network. When determining how much they would be prepared to pay for a network, bidders will include the present

value of any outperformance of the efficient benchmark and the present value of any other incentive payments that may be available to them.

37 The fact that bidders will consider outperformance and incentive payments is, of course, evidence of the incentive-based regulatory framework working exactly as intended – increasing the efficiency of electricity distribution for the long-term benefit of consumers.

38 In this regard, the SPARK investor presentation materials state that the TransGrid purchase offers:

> …ongoing financial benefits over the long term [via] active management of the assets to increase efficiency through better asset utilisation and process improvements.[11]

39 The materials also state that part of the value relates to the fact that:

> TransGrid's quality assets have further scope for immediate improvements in operating efficiencies and asset utilisation.[12]

40 The materials also refer to:

> Immediate opportunities to improve asset utilisation, contract management, process streamlining, maintenance practices and enhanced life cycle management of capex…and sustained productivity improvements[13]

and the:

> incentives based regulatory regime supportive of network outperformance[14]

and:

> Spark Infrastructure's proven track record of disciplined management and consistent out-performance of regulatory benchmarks.[15]

41 This evidence indicates that one successful bidder for the TransGrid assets applied material value to their ability to outperform the regulatory benchmarks under incentive based regulation. This alone would justify a bid price in excess of the RAB.

4.3.3 Buyers are paying for more than the regulated cash flows

42 When buyers purchase a regulated network, they are paying for more than the series of regulated cash flows that is allowed by the regulator. In addition to the considerations set out above, the purchase price will also reflect:

---

[11] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 9.

[12] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 10.

[13] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 14.

[14] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 23.

[15] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 30.

a. Value attributed to non-regulated assets owned by the regulated firm. In the case of TransGrid, bidders would have incorporated the value of TransGrid's unregulated activities into their valuation models;

b. Growth options – the potential for future growth in the earnings of the firm, arising from:

   i. The expansion of existing regulated and unregulated activities;

   ii. The development of new unregulated activities;

   iii. Increasing the scale and/or efficiency of regulated activities;

c. Synergies – an acquirer might be prepared to pay a premium for a network's assets, for instance, because there may be synergies with the acquirer's existing business or diversification benefits in relation to the acquirer's existing portfolio of assets (which is a distinct possibility here given many of the successful bidders own other energy networks). Such synergies may not be available to an efficient benchmark service provider.

d. Strategic considerations – gaining entry to a particular market might be of strategic importance to an acquirer seeking to establish an operation in a new market or reach an efficient scale in a market where it already has some interests.

43 In this regard, the SPARK investor presentation materials state that the TransGrid purchase offers:

a. Diversification benefits:

   Reduces portfolio risk by providing further diversification to Spark Infrastructure's existing investment portfolio by asset type, geography, regulatory timing and partnering.[16]

b. Growth in regulated businesses:

   Long term growth in the Regulatory Asset Base supported by macro economic driven demand growth expectations, and change in generation mix to renewables[17]

   and:

   Growth in centralised renewable energy provides expansion opportunities.[18]

c. Growth in unregulated businesses:

---

[16] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 10.

[17] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 9.

[18] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 14.

> Leverage quality assets and apply expertise to grow non-prescribed business opportunities.[19]

d. Efficiency improvements:

> Active management of the assets to increase efficiency through better asset utilisation and process improvements[20]
>
> and:
>
> Immediate opportunities to improve asset utilisation, contract management, process streamlining, maintenance practices and enhanced life cycle management of capex.[21]

44 In relation to the unregulated components of the TransGrid assets, the SPARK investor presentation materials make particular reference to TransGrid's existing network of fibre optic cables that are used for communication purposes. Indeed, the materials state that TransGrid has two broad lines of business – the regulated electricity network and a telecommunications business.[22] SPARK forecasts:

> Enhanced equity returns through growth in the non-prescribed businesses of TransGrid with further opportunity to grow a telecommunication service offering that leverages TransGrid's market positioning across NSW[23]

and that:

> Extension of network to connect to data centres and NBN Points of Interconnect ("POIs") in proximity of its network provides opportunity.[24]

45 The SPARK investor presentation materials also state that there is:

> Significant opportunity to grow non-prescribed business activity[25]

and that:

> Renewable generation projects expected to come on line as move towards fulfillment of the LRET progresses. These new generation projects provide opportunities for TransGrid to grow its connections.
>
> Existing contracts provide significant cashflow and value.
>
> Network modification opportunities as generation mix in the network changes with increases in large scale renewable energy projects.[26]

46 This evidence indicates that one successful bidder for the TransGrid assets has applied a material value to assets and benefits beyond the regulated stream of

---

[19] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 9.

[20] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 9.

[21] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 14.

[22] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 23.

[23] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 10.

[24] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 28.

[25] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 33.

[26] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 28.

cash flows from the existing RAB. This alone would justify a bid price in excess of the RAB.

4.3.4 Control premium

47 It is generally accepted in the literature and in financial market practice that investors will be prepared to pay a control premium to purchase a controlling interest in a firm.[27] The reasons for the payment of such a premium are essentially those set out above. For example, the controlling firm will now own any growth options held by the purchased firm and will be able to optimise any synergies that are available between the two firms.

48 Estimates of the size of the control premium vary around a central estimate of about 30%. This implies that investors would be prepared to pay 30% more for a controlling interest in a firm than for a minority interest. To use a price that was paid for a controlling interest to infer something about the required return on ordinary equity would therefore be clearly erroneous.

49 Independent expert valuation reports tend to be quite explicit about the existence and size of control premiums. For example, Grant Samuel have recently stated that:

> Takeover premiums are typically in the range 20-35% depending on the individual circumstances.[28]

and:

> The level of premiums observed in takeovers varies depending on the circumstances of the target and other factors (such as the potential for competing offers, synergies available to bidders and the strategic importance to the bidders of the target) but tend to fall in the range 20-35%.[29]

50 Similarly, Lonergan Edwards Associates (LEA) have recently stated that:

> Empirical evidence undertaken by LEA indicates that the average premium paid above the listed market price in successful takeovers in Australia ranges between 30% and 35% (assuming the pre-bid market price does not reflect any speculation of the takeover).[30]

51 And EY have recently stated that:

> The range of control premiums consistently referred to in Australia is generally between 20% and 40%.[31]

---

[27] See, for example, Schwert, G., 1995, "Markup pricing in mergers and acquisitions," *Journal of Financial Economics,* 41, 2, pp. 153-192 and Hall, L.S., 2014, "Determining control premiums: a better approach," *Valuation Strategies*, 17, 4, pp. 44-46.

[28] Grant Samuel & Associates, 2014, *Takeover Offer from Baosteel and Aurizon - Independent Expert Report for Aquila Resources Limited*, 20 June, p. 36.

[29] Grant Samuel & Associates, 2014, *Takeover Offer from Baosteel and Aurizon - Independent Expert Report for Aquila Resources Limited*, 20 June, p. 65.

[30] Lonergan Edwards & Associates, 2014, *Takeover Offer for Country Road Limited – Independent Expert Report*, 21 July, p. 45.

[31] EY, 2015, *Independent Expert's Report and Financial Services Guide - PanAust Limited Takeover Offer from Guangdong Risking H.K. (Holding) Limited*, 24 April, p. 65.

52 Because controlling interests are purchased at a material premium to ordinary equity, the prices paid for controlling interests cannot be used to infer anything about the required return on ordinary equity – even aside from the other reasons set out above.

53 In the case of TransGrid, the sale was for an effective 100% controlling interest in the company, so would be expected to embed a control premium. That control premium is not something that would be paid by a provider of equity capital with a minority interest.

4.3.5 Taxes and charges

54 The TransGrid sale price included $438 million of stamp duty. Deducting this amount would obviously result in a lower RAB multiple.

4.4 Return on equity to SPARK shareholders

55 SPARK announced a rights issue to raise $405.4 million of new equity to partially finance its contribution of $734.3 million towards the purchase price, the remainder being sourced from cash on hand and new debt.[32] The new shares were issued at $1.88 and carry full entitlement to the 2015 final dividend of 6 cents per share that had already been declared. Thus, net of that dividend, the price is $1.82. The SPARK investor presentation materials also set out future dividend guidance as follows:

> At least 12.5 cps guidance confirmed for FY 2016
>
> At least 13.0 cps guidance confirmed for FY 2017
>
> At least 13.5 cps guidance confirmed for FY 2018.[33]

56 This equates to a cash dividend yield of 6.9%, 7.1% and 7.4% relative to the $1.82 net share purchase price above.[34] That is, when raising new equity from its existing shareholders, SPARK has set the price such that the cash dividend yield alone, for which it has already provided guidance, is in the order of the AER's total allowed return on equity (which includes capital gains and the AER's assumed value of imputation credits).

57 In my view, this evidence does not suggest that SPARK considers that it would be able to raise equity from shareholders by offering them a total return that is commensurate with the 7.3% total allowed return on equity that the AER has set in its most recent determinations. In raising equity from its shareholders, SPARK has set the price so that investors will receive such a return from cash dividends alone.

58 Even if:

---

[32] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 9.

[33] SPARK Infrastructure Investor Presentation Materials, 25 November 2015, p. 11.

[34] 0.125/1.82; 0.13/1.82; and 0.135/1.82 respectively.

a. the return from forecasted dividends is considered to be only 7%; and

b. the SPARK share price is expected to exhibit zero real growth (so that it just maintains pace with inflation at an average of 2.5% p.a.);[35] and

c. there is zero expected return from imputation credits,

the expected return on the new equity raised would be in the order of 9.5% p.a.[36] This evidence is inconsistent with the proposition that the TransGrid sale supports the conclusion that investors consider a 7.1% return on equity to be more than adequate.

4.5 Previous regulatory consideration

59 The above analysis is consistent with previous consideration of this issue by the AER and other economic experts.

60 During its Rate of Return Guideline process, the AER considered whether transaction multiples could be used as a cross check of its allowed return. The transaction multiple is the ratio of the sale price of a network to the RAB for that same network. The AER considered whether a transaction multiple above 1.0 could be used to support the notion that the allowed return was adequate.

61 As set out below, the AER ultimately concluded that transaction multiples cannot be used for any useful purpose. The reason for this conclusion is the same as that set out above – the allowed return for the next regulatory period is one of many factors that potential buyers will consider. It is impossible to infer anything at all about one factor from observing the price that was ultimately paid for a network.

62 That any one or more of the relevant factors could equally explain a transaction multiple above one appears to be uncontentious. For instance, McKenzie and Partington (2011) advised the AER that:

> The source of this value premium could arise from economies of scale and synergies in general, from the opportunities for efficiency gains, from opportunities for growth, from the potential to exploit tax shields, or because the allowed regulated return is above the return really required. It is difficult to attribute the value premium across these components.[37]

and Cambridge Economic Policy Associates (CEPA) (2013) advised the AER that:

---

[35] I adopt this as a "low" case for purposes of comparison.

[36] This being the sum of the 7% dividend yield and the 2.5% capital growth to keep pace with inflation.

[37] McKenzie and Partington, 2011, Equity market risk premium, p. 34.

> …we accept, as per the arguments put forward by SFG Consulting, that there are limitations in what can be inferred from this market evidence.[38]

63 CEPA go on to conclude that there is evidence that trading multiples are above one for the four data points that are available, but that:

> The degree to which there is outperformance on the cost of equity is unclear.[39]

64 In its Rate of Return Guideline, the AER acknowledged that RAB multiples cannot be used to infer anything at all about the adequacy or otherwise of its allowed returns:

> We now propose to not apply levels and changes in RAB acquisition and trading multiples as a direct reasonableness check on the overall rate of return at the time of a particular revenue determination or access arrangement. Instead, we propose to use these multiples as part of a set of indicators that we monitor over time and across network businesses to help inform us of potential areas of inquiry and research. This more general use of these multiples reflects the fact that there are many potential influences on RAB acquisition and trading multiples, such as changes in the expectations and the realisations of business revenues, expenditures and rates of return. Given these many potential influences, any changes in these multiples may not be immediately attributable to any one factor.[40]

65 The AER has not relied on transaction multiples in any decisions since it published the Rate of Return Guideline for these same reasons.

66 Thus it is generally accepted that there are a number of reasons why the trading multiple may exceed one. Logically, to conclude anything about what the trading multiple implies about the allowed return on equity over the next five-year regulatory period, one would first have to quantify the effects of the plethora of other factors that also affect the trading multiple.

---

[38] CEPA, 2013, Advice on the estimation of the risk free rate and market risk premium, Report for the AER, p. 54.

[39] CEPA, 2013, Advice on the estimation of the risk free rate and market risk premium, Report for the AER, p. 54.

[40] AER, 2013, Rate of Return Guideline Explanatory Statement, p. 48.

5 Declaration

67 I confirm that I have made all the inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court.

Professor Stephen Gray

6 Appendix 1: Terms of Reference

Expert Terms of Reference

TransGrid transaction: Response to the VECUA submission

Jemena Electricity Networks (Vic) Limited
2016-20 Electricity Distribution Price Review

EDPR-5700-0019

Version B – 2 February 2016

Contact Person

Jacinta Davenport

Legal Counsel

Jemena Electricity Networks (VIC) Limited

ABN 95 052 167 405

321 Ferntree Gully Road
Mt Waverley VIC 3149

Postal Address:

Locked Bag 7000
Mt Waverley VIC 3149

Ph: (03) 8544 9000

Fax: (03) 8544 9888

Version	Status	Date	Prepared	Checked	Authorised
A	Draft	1/2/16	E Grace-Webb		
B	Final	2/2/16	E Grace-Webb	G+T	

Contents

1 Background

Jemena Electricity Networks (**JEN**) is an electricity distribution network service provider in Victoria. JEN supplies electricity to approximately 300,000 homes and businesses through its 10,285 kilometres of distribution system. JEN's electricity distribution system services 950 square kilometres of northwest greater Melbourne. JEN's electricity network is maintained by infrastructure management and services company, Jemena Asset Management (**JAM**).

JEN submitted its initial regulatory proposal with supporting information for the consideration of the Australian Energy Regulator (**AER**) on 30 April 2015. This proposal covers the period 2016-2020 (calendar years). The AER published its preliminary decision on 29 October 2015. JEN made a submission on revocation and substitution of the preliminary decision to the AER on 6 January 2016.

As with all of its economic regulatory functions and powers, when making the distribution determination to apply to JEN under the National Electricity Rules and National Electricity Law, the AER is required to do so in a manner that will or is likely to contribute to the achievement of the National Electricity Objective, which 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.*

Where the AER is making a distribution determination and there are two or more possible decisions that will or are likely to contribute to the achievement of the National Electricity Objective, the AER is required to make the decision that the AER is satisfied will or is likely to contribute to the achievement of the National Electricity Objective to the greatest degree.

The AER must also take into account the revenue and pricing principles in section 7A of the National Electricity Law when exercising its discretion in making those parts of a distribution determination relating to direct control network services. The revenue and pricing principles include the following:

> *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.*

Some of the key rules governing the making of a distribution determination are set out below.

Clause 6.4.3(a) of the National Electricity Rules provides that revenue for a regulated service provider is to be calculated adopting a "building block approach". It provides:

The annual revenue requirement for a Distribution Network Service Provider for each regulatory year of a regulatory control period must be determined using a building block approach, under which the building blocks are:

(1) indexation of the regulatory asset base – see paragraph (b)(1);

(2) a return on capital for that year – see paragraph (b)(2);

(3) the depreciation for that year – see paragraph (b)(3);

(4) the estimated cost of corporate income tax of the Distribution Network Service Provider for that year – see paragraph (b)(4);

(5) the revenue increments or decrements (if any) for that year arising from the application of any efficiency benefit sharing scheme, capital expenditure sharing scheme, service target performance incentive scheme, demand management and embedded generation connection incentive scheme or small-scale incentive scheme – see subparagraph (b)(5);

(6) the other revenue increments or decrements (if any) for that year arising from the application of a control mechanism in the previous regulatory control period – see paragraph (b)(6);

(6A) the revenue decrements (if any) for that year arising from the use of assets that provide standard control services to provide certain other services – see subparagraph (b)(6A); and

(7) the forecast operating expenditure for that year – see paragraph (b)(7).

Clause 6.5.2 of the National Electricity Rules, relating to the allowed rate of return, states:

Calculation of return on capital

(a) The return on capital for each regulatory year must be calculated by applying a rate of return for the relevant Distribution Network Service Provider for that regulatory year that is determined in accordance with this clause 6.5.2 (the allowed rate of return) to the value of the regulatory asset base for the relevant distribution system as at the beginning of that regulatory year (as established in accordance with clause 6.5.1 and schedule 6.2).

Allowed rate of return

(b) The allowed rate of return is to be determined such that it achieves the allowed rate of return objective.

(c) The allowed rate of return objective is that the rate of return for a Distribution Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Distribution Network Service Provider in respect of the provision of standard control services (the allowed rate of return objective).

(d) Subject to paragraph (b), the allowed rate of return for a regulatory year must be:

(1) a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs (as estimated under paragraph (f)) and the return on debt for that regulatory year (as estimated under paragraph (h)); and

(2) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in clause 6.5.3.

(e) In determining the allowed rate of return, regard must be had to:

(1) relevant estimation methods, financial models, market data and other evidence;

(2) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

(3) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

Return on equity

(f) The return on equity for a regulatory control period must be estimated such that it contributes to the achievement of the allowed rate of return objective.

(g) In estimating the return on equity under paragraph (f), regard must be had to the prevailing conditions in the market for equity funds.

Return on debt

(h) The return on debt for a regulatory year must be estimated such that it contributes to the achievement of the allowed rate of return objective.

(i) The return on debt may be estimated using a methodology which results in either:

(1) the return on debt for each regulatory year in the regulatory control period being the same; or

(2) the return on debt (and consequently the allowed rate of return) being, or potentially being, different for different regulatory years in the regulatory control period.

(j) Subject to paragraph (h), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:

(1) *the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the making of the distribution determination for the regulatory control period;*

(2) *the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period; or*

(3) *some combination of the returns referred to in subparagraphs (1) and (2).*

(k) In estimating the return on debt under paragraph (h), regard must be had to the following factors:

(1) *the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective;*

(2) *the interrelationship between the return on equity and the return on debt;*

(3) *the incentives that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of any capital expenditure; and*

(4) *any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next.*

(l) If the return on debt is to be estimated using a methodology of the type referred to in paragraph (i)(2) then a resulting change to the Distribution Network Service Provider's annual revenue requirement must be effected through the automatic application of a formula that is specified in the distribution determination."

[Subclauses (m)–(q) omitted].

The Victorian Energy Consumer and User Alliance (**VECUA**) recently submitted on the AER's preliminary decision for JEN, stating:[1]

> *In November 2015, the NSW transmission entity was sold (99 year lease) for $10.3 billion – a sale price that amounted to over 160% of its current regulated asset base (RAB) value.*

[1] VECUA, *Submission to the AER, AER Preliminary 2016–20 Revenue Determinations for the Victorian DNSPs*, 6 January 2016, p 14.

Throughout the recent TransGrid revenue determination process, TransGrid made many assertions that the AER's approach to determining its return on equity allowances would not enable TransGrid to recover efficient financing costs or to attract equity investors – claiming that it would result in lower investment in the network and a significant increase in TransGrid's financing risks.

The extraordinary sale price achieved by TransGrid makes a mockery of those claims.

VECUA refers the AER to the Spark Infrastructure equity investment prospectus, which outlines why investors are willing to pay such a large premium above the networks' book values.

In this context, JEN seeks a report from Frontier Economics, as a suitable qualified independent expert (**Expert**), to consider the implications of the recent TransGrid transaction for the AER's decision on the allowed rate of return. JEN seeks this report on behalf of itself, ActewAGL Distribution, and United Energy.

2 Scope of Work

The Expert will provide an opinion report that:

1. Considers and expresses an opinion in relation to the points raised in VECUA's submission on the implications of the TransGrid transaction, including:

   (a) Why a sale price for a regulated business might differ from the value of its regulated asset base; and

   (b) What, if anything, the TransGrid transaction says about the return required by investors.

In preparing the report the Expert will:

A. consider any relevant comments raised by the AER and other regulators, experts engaged by those regulators, and other stakeholders; and

B. use robust methods and data in producing any statistical estimates.

3 Information to be Considered

The Expert is also expected to consider the following information:

- such information that, in Expert's opinion, should be taken into account to address the questions outlined above;

- relevant literature on estimating the return on equity;

- the AER's Rate of Return Guideline, including explanatory statements and supporting expert material;
- material submitted to the AER as part of its consultation on the Rate of Return Guidelines; and
- previous decisions of the AER, other relevant regulators and the Australian Competition Tribunal on the return on debt and any supporting expert material, including the recent final decisions for Jemena Gas Networks and electricity networks in ACT, NSW, Queensland, South Australia and Tasmania.

4 Deliverables

At the completion of its review the Expert will provide an independent expert report which:

- is of a professional standard capable of being submitted to the AER;
- is prepared in accordance with the Federal Court Practice Note on Expert Witnesses in Proceedings in the Federal Court of Australia (CM 7) set out in Attachment 1, and includes an acknowledgement that the Expert has read the guidelines [2];
- contains a section summarising the Expert's experience and qualifications, and attaches the Expert's curriculum vitae (preferably in a schedule or annexure);
- identifies any person and their qualifications, who assists the Expert in preparing the report or in carrying out any research or test for the purposes of the report;
- summarises JEN's instructions and attaches these term of reference;
- includes an executive summary which highlights key aspects of the Expert's work and conclusions; and
- (without limiting the points above) carefully sets out the facts that the Expert has assumed in putting together his or her report, as well as identifying any other assumptions made, and the basis for those assumptions.

The Expert's report will include the findings for each of the three parts defined in the scope of works (Section 2).

5 Timetable

The Expert will deliver the final report to Jemena Regulation by **6 January 2016**.

[2] Available at: http://www.federalcourt.gov.au/law-and-practice/practice-documents/practice-notes/cm7.

6 Terms of Engagement

The terms on which the Expert will be engaged to provide the requested advice shall be:

- as provided in accordance with the Jemena Regulatory Consultancy Services Panel arrangements applicable to the Expert.

ATTACHMENT 1: FEDERAL COURT PRACTICE NOTE

Practice Note CM 7

EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA

Commencement

1. This Practice Note commences on 4 June 2013.

Introduction

2. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

3. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence[3], and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. General Duty to the Court[4]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert's Report[5]

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and

(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and

(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and

(d) identify the questions that the expert was asked to address; and

(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and

---

[3] As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

[4] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

[5] Rule 23.13.

(f) set out separately from the factual findings or assumptions each of the expert's opinions; and

(g) set out the reasons for each of the expert's opinions; and

(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[6]; and

(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that* [the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court*."

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[7].

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[8].

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

[6] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

[7] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

[8] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

7 Appendix 2: CV of Professor Stephen Gray

Stephen F. Gray

Professor of Finance
University of Queensland
Business School
Brisbane 4072
AUSTRALIA
Office: +61-7-3346 8032
Email: s.gray@business.uq.edu.au

Director
Frontier Economics
Email: Stephen.Gray@frontier-economics.com.au

Academic Qualifications

1995 Ph.D. (Finance), Graduate School of Business, Stanford University.
Dissertation Title: Essays in Empirical Finance
Committee Chairman: Ken Singleton
1989 LL.B. (Hons), Bachelor of Laws with Honours, University of Queensland.
1986 B.Com. (Hons), Bachelor of Commerce with Honours, University of Queensland.

Employment History

2000-Present Professor of Finance, UQ Business School, University of Queensland.
1997-2000 Associate Professor of Finance, Department of Commerce, University of Queensland and Research Associate Professor of Finance, Fuqua School of Business, Duke University.
1994-1997 Assistant Professor of Finance, Fuqua School of Business, Duke University.
1990-1993 Research Assistant, Graduate School of Business, Stanford University.
1988-1990 Assistant Professor of Finance, Department of Commerce, University of Queensland.
1987 Specialist Tutor in Finance, Queensland University of Technology.
1986 Teaching Assistant in Finance, Department of Commerce, University of Queensland.

Academic Awards

2014 E Yetton Prize for best paper in the Australian Journal of Management, Brailsford, T., S. Gray and S. Treepongkaruna, (2013), "Explaining the bid-ask spread in the foreign exchange market: A test of alternate models."
2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
2002 Journal of Financial Economics, All-Star Paper Award, for Modeling the Conditional Distribution of Interest Rates as a Regime-Switching Process, JFE, 1996, 42, 27-62.
2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).
2000 University of Queensland Award for Excellence in Teaching (a University-wide award).
1999 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
1999 KPMG Teaching Prize, Department of Commerce, University of Queensland.
1998 Faculty Teaching Prize (Business, Economics, and Law), University of Queensland.
1991 Jaedicke Fellow in Finance, Doctoral Program, Graduate School of Business, Stanford University.
1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.
1986 University Medal in Commerce, University of Queensland.

Large Grants (over $100, 000)

- Institute of Teaching and Learning Innovation Grant 2016-17, Technology-enhanced Learning Grant ($200,000), with K. Benson, B. Oliver and J. Birt.

- Australian Research Council Linkage Grant, 2008—2010, Managing Asymmetry Risk ($320,000), with T. Brailsford, J.Alcock, and Tactical Global Management.
- Intelligent Grid Cluster, Distributed Energy – CSIRO Energy Transformed Flagship Collaboration Cluster Grant, 2008-2010 ($552,000)
- Australian Research Council Research Infrastructure Block Grant, 2007—2008, Australian Financial Information Database ($279,754).
- Australian Research Council Discovery Grant, 2006—2008, Capital Management in a Stochastic Earnings Environment ($270,000).
- Australian Research Council Discovery Grant, 2005—2007, Australian Cost of Equity.
- Australian Research Council Discovery Grant, 2002—2004, Quantification Issues in Corporate Valuation, the Cost of Capital, and Optimal Capital Structure.
- Australian Research Council Strategic Partnership Grant, 1997—2000, Electricity Contracts and Securities in a Deregulated Market: Valuation and Risk Management for Market Participants.

Current Research Interests

Benchmark returns and the cost of capital. Corporate Finance. Capital structure. Real and strategic options and corporate valuation. Financial and credit risk management. Empirical finance and asset pricing.

Publications

Faff, R., S. Gray, and H. Norton, (2015), "Yes, one-day international cricket 'in-play' strategies can be profitable!" *Journal of Banking and Finance*, forthcoming.

Gray, S. and J. Nowland, (2015), "The Diversity of Expertise on Corporate Boards in Australia," *Accounting and Finance*, forthcoming.

Darat, A., S. Gray, J. C. Park and S. Wu, (2014), "Corporate governance and bankruptcy risk" *Journal of Accounting, Auditing and Finance*, forthcoming.

Gray, S., I. Harymawan and J. Nowland, (2014), "Political and government connections on corporate boards in Australia: Good for business?" *Australian Journal of Management*, forthcoming.

Brailsford, T., S. Gray and S. Treepongkaruna, (2014), "Explaining the bid-ask spread in the foreign exchange market: A test of alternate models," *Australian Journal of Management*, 39, 4, 573-591.

Faff, R., S. Gray and M. Poulsen, (2014), "Financial inflexibility and the value premium," *International Review of Finance*, 13, 3, 327-344.

Fitzgerald, T., S. Gray, J. Hall and R. Jeyaraj, (2013), "Unconstrained estimates of the equity risk premium" *Review of Accounting Studies*, 18, 560-639.

Gray, S. and J. Nowland, (2013), "Is prior director experience valuable?" *Accounting and Finance*, 53, 643-666.

Chen, E. T., S. Gray and J. Nowland, (2012), "Family representatives in family firms" *Corporate Governance: An International Review*, 21(3), 242-263.

Treepongkaruna, S., R. Brooks and S. Gray, (2012), "Do Trading Hours Affect Volatility Links in the Foreign Exchange Market?" *Australian Journal of Management*, 37, 7-27.

Chen, E. T., S. Gray and J. Nowland, (2012), "Multiple founders and firm value" *Pacific Basin Finance Journal*, 20, 3, 398-415.

Chan, K-F., R. Brooks, S. Treepongkaruna and S. Gray, (2011), "Asset market linkages: Evidence from financial, commodity and real estate assets," *Journal of Banking and Finance*, 35, 6, 1415-1426.

Parmenter, B, A. Breckenridge, and S. Gray, (2010), 'Economic Analysis of the Government's Recent Mining Tax Proposals', *Economic Papers*: *A Journal of Economics and Policy*, 29(3), September, 279-91.

Gray, S., C. Gaunt and Y. Wu, (2010), "A comparison of alternative bankruptcy prediction models," *Journal of Contemporary Accounting and Economics*, 6, 1, 34-45.

Feuerherdt, C., S. Gray and J. Hall, (2010), "The Value of Imputation Tax Credits on Australian Hybrid Securities," *International Review of Finance*, 10, 3, 365-401.

Gray, S., J. Hall, D. Klease and A. McCrystal, (2009), "Bias, stability and predictive ability in the measurement of systematic risk," *Accounting Research Journal*, 22, 3, 220-236.

Treepongkaruna, S. and S. Gray, (2009), "Information volatility links in the foreign exchange market," *Accounting and Finance*, 49, 2, 385-405.

Costello, D., S. Gray, and A. McCrystal, (2008), "The diversification benefits of Australian equities," *JASSA*, 2008, 4, 31-35.

Gray, S. and J. Hall, (2008), "The Relationship Between Franking Credits and the Market Risk Premium: A Reply," *Accounting and Finance*, 48, 1, 133-142.

Gray, S., A. Mirkovic and V. Ragunathan, (2006), "The Determinants of Credit Ratings: Australian Evidence," *Australian Journal of Management*, 31(2), 333-354.

Choy, E., S. Gray and V. Ragunathan, (2006), "The Effect of Credit Rating Changes on Australian Stock Returns," *Accounting and Finance*, 46(5), 755-769.

Gray, S. and J. Hall, (2006), "The Relationship Between Franking Credits and the Market Risk Premium," *Accounting and Finance*, 46(3), 405-428.

Gray, S. and S. Treepongkaruna, (2006), "Are there non-linearities in short-term interest rates?" *Accounting and Finance*, 46(1), 149-167.

Gray, P., S. Gray and T. Roche, (2005), "A Note on the Efficiency in Football Betting Markets: The Economic Significance of Trading Strategies," *Accounting and Finance*, 45(2) 269-281.

Duffie, D., S. Gray and P. Hoang, (2004), "Volatility in Energy Prices. In V. Kaminski," (Ed.), *Managing Energy Price Risk: The New Challenges and Solutions* (3rd ed.). London: Risk Books.

Cannavan, D., F. Finn and S. Gray, (2004), "The Value of Dividend Imputation Tax Credits in Australia," *Journal of Financial Economics*, 73, 167-197.

Gray, S. and S. Treepongkaruna, (2003), "Valuing Interest Rate Derivatives Using a Monte-Carlo Approach," *Accounting and Finance*, 43(2), 231-259.

Gray, S., T. Smith and R. Whaley, (2003), "Stock Splits: Implications for Investor Trading Costs," *Journal of Empirical Finance*, 10, 271-303.

Gray, S. and S. Treepongkaruna, (2003), "On the Robustness of Short-term Interest Rate Models," *Accounting and Finance*, 43(1), 87-121.

Gray, S. and S. Treepongkaruna, (2002), "How to Value Interest Rate Derivatives in a No-Arbitrage Setting," *Accounting Research Journal* (15), 1.

Gray, P. and S. Gray, (2001), "A Framework for Valuing Derivative Securities," *Financial Markets Institutions & Instruments*, 10(5), 253-276.

Gray, P. and S. Gray, (2001), "Option Pricing: A Synthesis of Alternate Approaches," *Accounting Research Journal*, 14(1), 75-83.

Dahlquist, M. and S. Gray, (2000), "Regime-Switching and Interest Rates in the European Monetary System," *Journal of International Economics*, 50(2), 399-419.

Bollen, N., S. Gray and R. Whaley, (2000), "Regime-Switching in Foreign Exchange Rates: Evidence from Currency Options," *Journal of Econometrics*, 94, 239-276.

Duffie, D., S. Gray and P. Hoang, (1999), "Volatility in Energy Prices. In R. Jameson," (Ed.), *Managing Energy Price Risk* (2nd ed.). London: Risk Publications.

Gray, S. and R. Whaley, (1999), "Reset Put Options: Valuation, Risk Characteristics, and an Example," *Australian Journal of Management*, 24(1), 1-21.

Bekaert, G. and S. Gray, (1998), "Target Zones and Exchange Rates: An Empirical Investigation," *Journal of International Economics*, 45(1), 1-35.

Gray, S. and R. Whaley, (1997), "Valuing S&P 500 Bear Market Warrants with a Periodic Reset," *Journal of Derivatives*, 5(1), 99-106.

Gray, S. and P. Gray, (1997), "Testing Market Efficiency: Evidence from the NFL Sports Betting Market," *The Journal of Finance*, 52(4), 1725-1737.

Gray, S. (1996), "Modeling the Conditional Distribution of Interest Rates as a Regime- Switching Process," *Journal of Financial Economics*, 42, 27-62.

Gray, S. (1996), "Regime-Switching in Australian Interest Rates," *Accounting and Finance*, 36(1), 65-88.

Brailsford, T., S. Easton, P.Gray and S. Gray, (1995), "The Efficiency of Australian Football Betting Markets," *Australian Journal of Management*, 20(2), 167-196.

Duffie, D. and S. Gray, (1995), "Volatility in Energy Prices," In R. Jameson (Ed.), *Managing Energy Price Risk*, London: Risk Publications.

Gray, S. and A. Lynch, (1990), "An Alternative Explanation of the January Anomaly," *Accounting Research Journal*, 3(1), 19-27.

Gray, S. (1989), "Put Call Parity: An Extension of Boundary Conditions," *Australian Journal of Management*, 14(2), 151-170.

Gray, S. (1988), "The Straddle and the Efficiency of the Australian Exchange Traded Options Market," *Accounting Research Journal*, 1(2), 15-27.

Teaching

Fuqua School of Business, Duke University, Student Evaluations (0-7 scale):

- Financial Management (MBA Core): Average 6.5 over 7 years.
- Advanced Derivatives: Average 6.6 over 4 years.
- Empirical Issues in Asset Pricing: Ph.D. Class

1999, 2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.

UQ Business School, University of Queensland, Student Evaluations (0-7 scale):

- Finance (MBA Core): Average 6.6 over 10 years.
- Corporate Finance Honours: Average 6.9 over 10 years.

2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).
2000 University of Queensland Award for Excellence in Teaching.
1999 Department of Commerce KPMG Teaching Prize, University of Queensland.
1998 Faculty Teaching Prize, Faculty of Business Economics and Law, University of Queensland.
1998 Commendation for Excellence in Teaching, University-wide Teaching Awards, University of Queensland.
1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.

Board Positions

2012 - Present: Director, Children's Hospital Foundation, Queensland.
2002 - Present: Director, Financial Management Association of Australia Ltd.
2003 - 2012: Director, Moreton Bay Boys College Ltd. (Chairman from 2007).
2002 - 2007: External Risk Advisor to Board of Enertrade (Queensland Power Trading Corporation Ltd.)

Consulting

SFG Consulting: 1997-2014.
Frontier Economics: 2014-Present.

Twenty years' experience in consulting to companies, government-owned corporations, government and regulatory agencies. Examples include:

- *Regulatory cost of capital*: Preparation of submissions in regulatory determinations. Clients include all Australian energy transmission and distribution businesses, FOXTEL, Telstra, BBI, ACCC, IPART, ERA.

- *Corporate cost of capital reviews*: Review of cost of capital estimates for project evaluation and impairment testing purposes. Clients include QANTAS, Stanwell Corporation, Ecowise.

- *Executive stock option valuation*: Clients include Collins Foods Group, Ground Probe, Crater Gold Mining, Beach Petroleum.

- *New Project Evaluation*: Assisting companies and GOCs to evaluate proposed new projects. Particular focus is on quantifying risk and uncertainty and presenting possible outcomes in a probabilistic framework. Clients include Queensland Treasury Corporation, Queensland Accommodation Group, Stanwell, EnerTrade.

- *Financial modelling and forecasting*: Clients include ATO (forecasting delinquent payments), ASX (forecasting trading volumes), Compass Resources (integrated mine valuation model).

Retained as a valuation expert in many litigation cases; produced many expert witness reports; appeared in Court for cross examination many times including:

- *Macquarie Generation*: Witness for AGL in competition case.
- *Telstra v. ACCC*: Witness for Telstra in rate of return regulation case.
- *C7 Case*: Witness for PBL, Newscorp, Telstra re valuation of Seven's failed cable TV network.
- *Alcan v. NT Commissioner of Revenue*: Witness for Alcan re valuation of combined bauxite mine and alumina refinery for stamp duty purposes.

FRONTIER ECONOMICS | MELBOURNE | SYDNEY
Frontier Economics Pty Ltd 395 Collins Street Melbourne Victoria 3000
Tel: +61 (0)3 9620 4488 Fax: +61 (0)3 9620 4499 www.frontier-economics.com
ACN: 087 553 124 ABN: 13 087 553 124