AUSTRALIAN ENERGY REGULATOR

AER WACC review

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Introduction

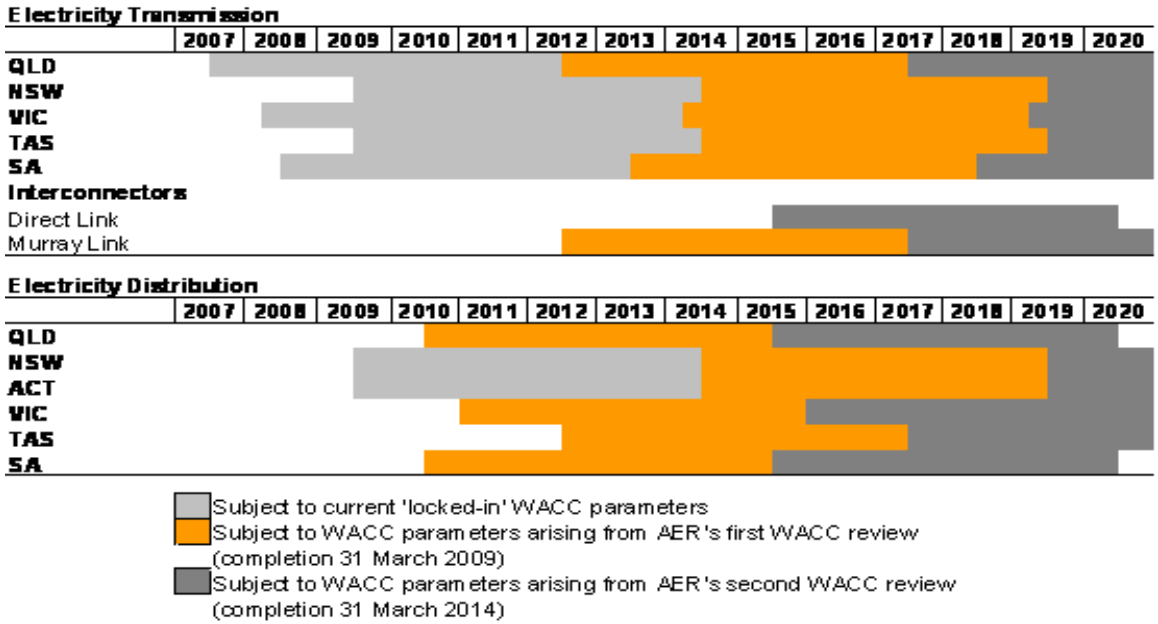
- NER provide that the AER review the WACC parameters for electricity transmission and distribution
- Reviews are to be conducted every 5 years, for transmission, and at least every 5 years for distribution
- First review to be concluded by 31 March 2009

Consultation process

6 August 2008	Release of issues paper
24 September 2008	Submissions received on issues paper
10 October 2008	Roundtable of finance experts
11 December 2008	Release of proposed revised WACC parameters
28 January 2009	Submissions due on proposed revised WACC parameters
31 March 2009	Release of final WACC parameters

Applicability of review

Electricity



- Electricity transmission
  - Outcomes ‘locked-in’
- Electricity distribution
  - Departure permissible for individual determination if ‘persuasive evidence’ to do so

Gas

- No industry-wide review envisaged in NGL/NGR
- Outcomes of this review will be informative, particularly for market-wide parameters, but has no formal applicability
- Service provider proposes WACC parameters, AER assesses on case-by-case basis

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Scope of the review

- AER review is limited to the individual WACC parameters (e.g. the use of the CAPM is not subject to the review)

- The AER may review the values and methods of:

  - The nominal risk free rate
  - The equity beta
  - The expected market risk premium
  - The market value of debt as a proportion of the market value of debt and equity (i.e. the gearing ratio)
  - The credit rating levels to calculate the debt risk premium
  - The assumed utilisation of imputation credits (i.e. gamma) used to calculate the estimated cost of corporate tax.

Regulatory requirements

- National Electricity Objective
- National Electricity Law
  - Revenue and pricing principles
- National Electricity Rules
  - Use of ('standard' / Sharpe) CAPM, compensate only for systematic risk
  - Forward looking, commensurate with prevailing conditions and risk of providing regulated services
  - Reflect current cost of borrowings for comparable debt
  - Based on benchmark efficient service provider
  - Need for persuasive evidence before departing from previously adopted value / method

AER's approach to the review

- AER has undertaken a detailed analysis of all available evidence from submissions and expert consultants

- In reviewing each WACC parameter, AER has taken a balanced approach to the application and interpretation of evidence from market data. This involves:

  – Not changing a parameter where the market data is not materially different to the previously adopted value, and

  – Not moving as far as the market data would suggest even where the market data is substantially different to the previously adopted value

Broader issues raised

- New investment
  - Need for sufficient returns to meet significant growth in energy demand and replacement of aging infrastructure
- Response to climate change concerns
  - Concerns for returns to be sufficient given increased uncertainty associated with new climate change policies etc
- Current state of financial markets
  - Recognise markets have re-priced risk and the need for required returns to recognise this

New investment

- Regulatory regime provides businesses with additional capex allowance, if appropriate capex criteria is satisfied
- AER has approved (or preliminarily approved) new investment of $23b since mid-2007
- Regulatory regime minimises risks associated with long lived assets
  - no asset stranding risk
  - no asset re-optimisation or ex-post prudency assessment
  - pass-through and contingent project provisions
  - absence of asset stranding or re-optimisation provides for the recovery of and return on investment over economic life of assets
- Businesses fully compensated for cost of debt changes at time of each regulatory determination

Current state of financial markets

- Submissions: the review should recognise the negative outlook for financial markets will inhibit access to debt and equity finance to fund investment

- AER: while current conditions in financial (particularly debt) are far from favourable, market based evidence from a number of sources strongly suggests that rather than creating risks, the regulatory regime insulates network businesses from market volatility

- AER: evidence indicates regulated networks are able to access finance even in the current financial markets

- For the majority of businesses, the outcomes of this review will not apply until after 2011 and will be relevant until 2019 for some businesses, so that consideration needs to look beyond current conditions

Current financial markets – meeting the cost of debt

- Evidence indicates businesses adopt a prudent financing strategy by seeking a diversified portfolio to minimise refinancing risk (i.e. risk of not being able to re-finance an entire debt portfolio at the one time)

- The AER recognises that the current market volatility may create interest rate risk for regulated businesses that do not refinance all of their debt at the time of the reset, particularly businesses that:

  – had regulatory resets prior to the onset of the credit crisis and
  – need to raise finance to fund new capex in the current market

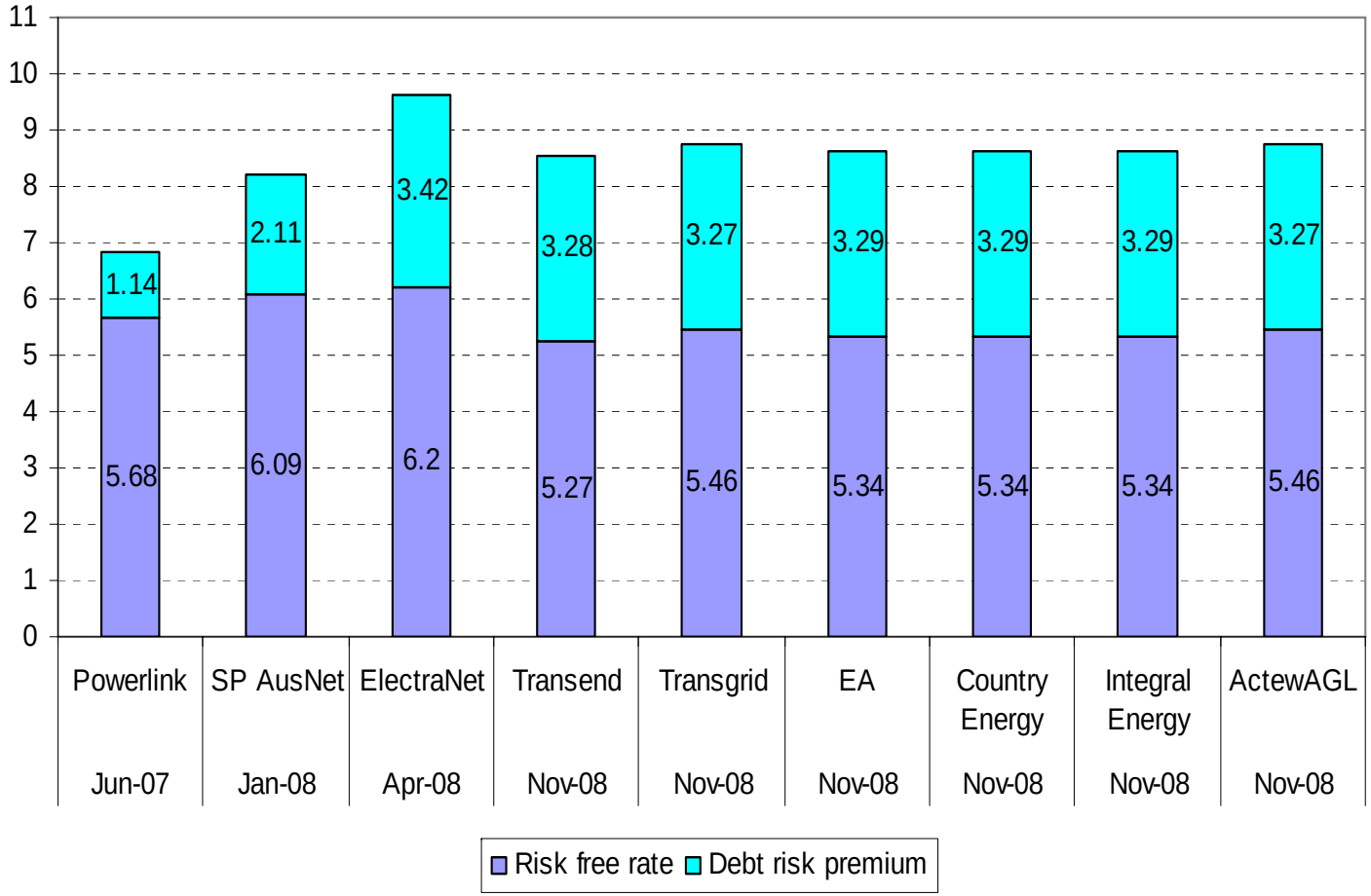
- To the extent that residual interest rate and refinancing risks are systematic they should be incorporated into existing returns (i.e. equity beta)

- Hedging to mitigate interest rate risk is likely to play an important role for regulated businesses – compensation if necessary can be considered as part of regulatory proposal

Current state of financial markets – meeting the cost of debt

- Evidence indicates that the current corporate bond market in Australia has no liquidity and is likely to remain illiquid for the next 1-2 years
- Evidence indicates that financing is still available - expected that regulated businesses will have to raise short term debt – e.g. three year bank debt
- The regulatory regime still compensates regulated businesses for the cost of financing based on benchmark corporate bond yields prevailing at time of reset, even if firms use lower cost alternatives

Cost of debt – recent draft and final decisions



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Climate change concerns

- Submissions raised concerns that uncertainty regarding Government policy around climate change may cause required rates of return to increase (i.e. CPRS and expanded RETS)
- Government's policy response (as reflected in White paper) designed to provide requisite certainty to the market to meet climate change goals
- Scope for new investment to meet climate change requirements provided in ex-ante capex allowances and contingent projects for transmission investments, flexibility in timing and selection of projects and cost pass through provisions
- Additions to networks to connect new renewable energy funded likely to be directly by generators (not included in RAB)
- AER is of the view that the Government's response to climate change concerns does not require increased rate of return for network businesses

WACC parameters

Parameter	Previously adopted	AER proposed
Gearing	60%	60%
Nominal risk free rate	CGS (10 year term)	CGS (term matching the regulatory period)
MRP	6%	6%
Equity beta	1.0 / 0.9	0.8
Credit rating	BBB+	A-
Gamma	0.5	0.65

Multi-parameter considerations

- Consistency between parameters in estimation
  - Gamma is linked to the MRP
  - The gearing ratio is linked to the credit rating and equity beta
  - The term of the risk free is linked to the debt risk premium and the MRP
  - The AER has taken these inter-linkages into account

- Form of the CAPM (domestic or international)
  - AER proposes to continue with the Officer framework with foreign investors recognised consistent with their presence in the Australian domestic capital market

- Definition of the benchmark efficient service provider
  - AER considers that the benchmark business is a pure play electricity network business

WACC parameter - Gearing

- Submissions
  - JIA (60:40)
  - MEU (70:30)
  - JIA market valuation of gearing appropriate
    - NER requirement for transmission
    - Book value of debt is proxy for market value of debt
    - Book value of debt should be adjusted for loan notes and ‘double leveraging’ (where applicable)

WACC parameter - Gearing

- Approaches to valuation and definition of debt and equity
  - Book value approach (Bloomberg and Standard and Poor's), and
  - 'Market value' approach (Bloomberg)
  - Adjusted 'market value' approach (the ACG)
- Selection of comparator businesses
  - The AER has examined Standard and Poor's decisions excluding businesses that:
    - do not own or operate either a gas or electricity network
    - are involved with significant mergers and acquisition activities, and/or
    - are involved in substantial unregulated activities

WACC parameter - Gearing

- Measurement
  - AER has examined estimates over a period that is broadly similar to the period used to estimate the equity beta
  - AER has examined annual averages to assess whether sub prime crisis has impacted actual gearing levels

- Conclusions
  - there was insufficient information at this stage to examine the impacts of the sub-prime crisis on gearing
  - The AER considered there was not sufficient persuasive evidence to depart from 60 per cent

WACC parameter - Nominal risk free rate

- Submissions
  - JIA: status quo (CGS 10 year risk free proxy, 5-40 days)
  - Alternative proxies available (interest rate swaps)
  - Prudent financing strategy is to match asset lives and issue long term debt

WACC parameter - Nominal risk free rate

Term of the risk free proxy

- Evidence indicates a term of the risk free rate which matches the length of the regulatory period (i.e. 5 years) better reflects the financing strategies of regulated businesses

		Average Term		
Network Businesses	**Not Disclosed**	**<1 Year**	**1 to 5 Years**	**>5 Years**
Government	4%	8%	68%	20%
Non Government	0%	13%	44%	43%
Industry Average	**1%**	**11%**	**53%**	**34%**

WACC parameter - Nominal risk free rate

- The AER has examined costs and benefits of moving term from 10 years:
  - Evidence indicates that in a relative sense there is not an issue with liquidity in the shorter term CGS and corporate bond markets
  - A move to a five-year term is not expected to impose additional rollover risk, given financing practices
  - No incremental increases in debt transaction costs given current regulatory approach
  - A positive term premium from 5 to 10 years indicates a material benefit to consumers

WACC parameter - Nominal risk free rate

- Consistency with the market risk premium
  - The AER considered that a forward-looking MRP of 6 per cent is consistent with a 5-year term assumption for the risk free rate

- Measuring the risk free rate
  - The AER proposed to retain the current NER methodology, with one exception, the AER will only accept an averaging period commencing as close as practically possible to the start of the regulatory control period

- An averaging period calculated over 10-40 business days in length will be accepted as reasonable

WACC parameter - Nominal risk free rate

- Proxy for the nominal risk free rate
  - AER considers that continued use of Australian CGS as the proxy for the risk free asset is appropriate in the context of the current review
  - CGS represents a reasonable proxy for the risk-free rate under the CAPM paradigm compared to any other alternatives
  - It also accords with standard commercial and regulatory practice

WACC parameter - Market risk premium

- Submissions
  - MEU: 5.5% (range 5-6%)
  - JIA: 7% with 0.2 gamma, 6% with zero gamma
  - Other industry submissions: focused on interaction between MRP and gamma

- Basis of original 6% MRP

  - Regulators did have regard to the value of imputation credits in establishing 6% (1998 Vic gas decisions).
  - 6% does not need to be 'corrected' for positive gamma.

WACC parameter - Market risk premium

Historical estimates

- **Estimation period**
  - Brailsford, Handley and Maheswaran (2008) identified several material step changes in data quality of Australian historical equity and bond returns (1883, 1937, 1958, 1980, 1988)
  - BHM (2008): pre-1958 data likely to overestimate historical returns
  - AER considers 1883-2008, 1937-2008, 1958-2008 appropriate. Will update estimates for 2008 ‘full year’ for final decision
  - AER position similar to JIA / Officer and Bishop on length of estimation period (who consider 1958-onwards should be ‘primary estimate’ with other periods ‘cross-checks’)
  - But MRP should not be determined mechanistically from historical data alone

WACC parameter - Market risk premium

Historical estimates (cont'd)

- Term of risk free rate proxy
  - Consistency important
  - Officer and Bishop estimate long-term difference between 5yr / 10yr CGS is around 20bp
  - AER considers historical returns relative to 10yr CGS should be interpreted accordingly (i.e. may understate returns relative to 5yr CGS by around 20bp)
- Adjustments for imputation credits
  - Part of return to equity investors, capital gains and dividends should be 'grossed-up'
  - AER agrees with JIA / Officer and Bishop on principle and approach

WACC parameter - Market risk premium

Considerations

- Long term historical returns, ‘grossed-up’ for distributed imputation credits valued at 0.65, and plus 20bp for difference between 5 and 10 year CGS => 6.1-6.7%
- Historical estimates more likely to overstate forward looking MRP due to positive unexpected or one-off events
- Surveys of market practitioners support 6% - good ‘cross-check’
- Cash flow measures (implied cost of equity from dividend growth model) generally support around 6%, sometimes lower – ok ‘cross-check’ but has limitations

Conclusion

- Overall, 6% remains reasonable estimate of forward looking MRP, no persuasive evidence to depart from 6%

WACC parameter - Equity beta

- Submissions
  - MEU (0.70)
  - JIA (1.0)
  - APIA (equity beta for gas businesses may be different)

WACC parameter - Equity beta

- Systematic risk comprises business risk and financial risk
- AER and JIA agree that business risk for regulated networks lower than market average
- AER overall considers that the equity beta of a benchmark efficient electricity network service provider is likely to be less than the market average noting that:
  - business risk likely to be substantially less due to nature of industry (e.g. high price inelasticity) and nature of regulatory regime (e.g. ex ante approach, no re-valuing of asset base, no asset stranding, pass-through provisions)
  - financial risk may be higher than the market average given gearing is higher than the market average (but this also reflects lower business risks)
- AER / JIA / MEU agree that equity beta should not differ based on form of control (rev cap vs. price cap) as differences in exposure to systematic risk not likely to be substantial

WACC parameter - Equity beta

Empirical estimates

- Comparator businesses
  - Aust: use of electricity / gas / integrated reasonable given limited sample
  - US: can be more selective (exclude ‘pure play’ gas) given large sample
- Estimation period
  - Use longest period available, excluding ‘tech bubble’, provided sufficient number of comparable businesses present
  - Aust: all data post-tech bubble
  - US: data pre- and post-tech bubble
- Frequency of observations
  - Monthly reasonable
  - Weekly may better to capture more observations

WACC parameter - Equity beta

Empirical estimates (cont'd)

- Treatment of outliers
  - Consideration of a range of estimation techniques appropriate (OLS, re-weighted OLS, LAD)
- Confidence intervals
  - Primary weight should be placed on central estimates rather than confidence intervals
- R-squared statistic
  - Low R-squared does not indicate 'bias' as claimed by SFG
  - Not particularly relevant in beta estimation, seeks to explain model's explanatory power of total risk not just systematic risk
- Blume and Vasicek adjustments
  - Not appropriate in regulatory context

WACC parameter - Equity beta

Other issues

- Use of Sharpe CAPM
  - Mandated by NER
  - CEG report claiming Sharpe CAPM produces downwards (upwards) biased estimates for betas less (more) than one not persuasive
  - Even if correct, appropriate response would be change to framework
  - In any event, the AER has been conservative in proposing an equity beta that is much higher than empirical estimates alone would suggest
- Implied cost of equity from dividend growth model
  - Limitations with CEG report
  - Only appropriate for 'back of the envelope calculations'

WACC parameter - Equity beta

Considerations

- Regard to conceptual considerations suggests equity beta for regulated electricity networks is less than one
- Empirical estimates suggest a range of 0.44 to 0.68
- Persuasive evidence to depart from either 0.9 or 1.0

Conclusion

- AER considers 0.8 is reasonable estimate having regard to a range of considerations, including regulatory stability and current state of the financial markets

WACC parameter – Credit rating

- **Submissions**
  - MEU (A+)
  - JIA (BBB+)
    - JIA all three analytical approaches should be used
    - Median/simple averages
    - Regression analysis
    - Best comparators approach
  - But JIA submit limitations with median/simple average approach, and regression approach

WACC parameter - Credit rating

Analytical approaches

- AER has examined these approaches used to inform credit rating
  - Median credit ratings
  - Average credit ratings, and
  - Regression approaches
- ‘Best comparators’ approach is considered inappropriate

Selection of comparator businesses

- ‘Pure play’ electricity network
- Electricity transmission and distribution
- Government and gas businesses

WACC parameter - Credit rating

Considerations

- Information from Standard and Poor's used to inform the credit rating
- Median credit ratings used as the primary approach and average credit ratings and regression analysis used a a cross check
- Empirical evidence for energy networks provides a range of ratings of A- to A+ across these approaches

WACC parameter - Credit rating

Conclusion

Measure	Energy Networks	Government Energy Networks	Private Energy Networks	Private Gas Networks	Private electricity Networks
Median Credit Rating (2002 – 2008)	**A-**	AA	BBB+	BBB	**A-**
Median Credit Rating (2002 -2007)	**A-**	AA	BBB+	BBB	**A-**
Median Credit Rating (2002 -2006)	**A-**	AA	BBB+	BBB	**A-**
Median Credit Rating (2003 -2007)	**A-**	AA	BBB+	BBB	**A-**
Median Credit Rating (2004 -2008)	**A-**	AA	BBB+	BBB	**A-**

- The AER considers there is persuasive evidence to depart from BBB+ to A-

WACC parameter - Gamma

- **Submissions**

  - MEU (0.85)
  - JIA: zero (w MRP of 6%); 0.2 (w MRP of 7%)
  - JIA submit use data from pre and post 2000
  - JIA submit payout ratio 0.71
  - Latest dividend drop-off: theta 0.2 – 0.35
  - Redemption rates from tax statistics not relevant to theta, as does not provide 'value'

WACC parameter - Gamma

Defining gamma

- Propose to adopt a payout ratio of 1 consistent with the standard approach to valuation as well as the Officer framework

Theoretical issues with theta

- The AER will adopt a conceptual framework that defines ‘the market’ as the domestic Australian capital market with foreign investors recognised to the extent they invest in the market
- Average / Marginal investor - theta is best considered a weighted average valuation of all investors in the defined market
- This theoretical position does not preclude the consideration of any of the available empirical methodologies to estimate theta

WACC parameter - Gamma

The appropriate time period for estimating theta

- The NER requires that gamma be estimated on a forward-looking basis, and AER proposes to inform its view of theta based on post 2000 data

Estimating theta

- The 2006 Beggs and Skeels dividend drop off study provides the most comprehensive, reliable and robust estimate of theta inferred from market prices (0.57)
- The reliability of the estimates provided by SFG in its 2008 dividend drop-off study has not been verified at this stage
- Handley and Mahesawaran (2008) tax study estimates theta of 0.67 pre-2000 and an upper bound of 0.81 post-2000 (mid-point 0.74)
- The AER considers that a reasonable range of theta to be between 0.57 (dividend drop off studies) and 0.74 (tax statistics)

WACC parameter - Gamma

Conclusions

- The AER proposes a gamma value of 0.65 based on a payout ratio of 1 and a theta value of 0.65 (mid point of the range between 0.57 and 0.74)

Process - Next steps

28 January 2009	Submissions due on proposed revised WACC parameters
31 March 2009	Release of final WACC parameters

The AER is unlikely to be able to fully consider or give full weight to submissions received after 28 January 2009

Questions?