origin

11 May 2012

Dr Peter J Boxall
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

BY EMAIL ipart@ipart.nsw.gov.au

Dear Dr Boxall

Changes in regulated electricity retail prices from 1 July 2012

Origin Energy (Origin) welcomes this opportunity to comment on *Changes in regulated electricity retail prices from 1 July 2012: Electricity - Draft Report* (draft report) prepared by the Independent Pricing and Regulatory Tribunal (IPART).

As identified by IPART in its draft report, electricity prices have increased significantly over the past five years and in 2012-13 will increase again. Over the past two years the main reasons for these increases have been a substantial rise in network costs and the cost of green schemes (with the purpose of mitigating carbon emissions). For 2012-13, the price increases are again being driven by rising network costs but also the introduction of the carbon pricing mechanism. Origin would highlight that the overall price increase is being slightly offset by a reduction in the allowance for energy costs (excluding carbon).

Origin is surprised by the decrease in the energy cost component (excluding carbon) and has serious concerns with the input costs used in the Long Run Marginal Cost (LRMC) calculation as modelled by Frontier. Origin believes the change in the cost inputs is unrealistic and the subsequent reduction in the LRMC is artificial.

Having said this, Origin generally supports the Annual Review process undertaken by IPART and accepts the current process and that the draft decision has been modelled in line with previous annual review decisions. Consequently, this Origin submission focuses predominantly on Origin's key points of concern with regard to the LRMC calculation, including how the cost of carbon has been estimated.

Customers benefit from maintaining the current level of competitive rivalry present in NSW which will not be achieved unless retailers are in a position to fully recover underlying costs. Origin believes that IPART needs to amend its draft report to take account of the following concerns in its Final Decision and for future regulated electricity pricing decisions. These are centred on the calculation of LRMC and in particular:

- new entrant coal costs are undervalued. IPART and Frontier have not considered recent information but simply escalated previous historic coal cost estimates using historic growth rates. A further review of new entrant coal costs used in the LRMC calculation should be undertaken as the values used by Frontier do not reflect the

Origin Energy Retail Ltd ABN 22 078 868 425 • Level 21, 360 Elizabeth Street Melbourne VIC 3000
GPO Box 186, Melbourne VIC 3001 • Telephone (03) 9652 5555 • Facsimile (03) 9652 5553 • www.originenergy.com.au

strength of the coal export market and its impact on coal prices nor reflect recent domestic coal supply agreements;

- new entrant gas costs have similarly been underestimated and require further review as the gas fuel costs used in the LRMC calculation do not reflect the marked change in gas prices arising from local LNG developments;
- the impact of the derivation of the Risk Free Rate in the WACC decision (as proxied by the current yield of 10 year Australian Government Bond). IPART has based the Risk Free Rate on the methodology it has previously used in its annual review process. However, this method uses a relatively short measurement period of 20 days, which can be distorted by short term economic factors that may have an impact on Government Bond Yield but not on the required yields of equity investors. It is not appropriate to use a 20 day measurement period in the current market environment and in doing so, IPART has not had regard to "efficient costs" as it is required to do. A more normalised view of the Risk Free Rate should be adopted for 2012-13;
- Origin supports the use of the Bloomberg 7 year fair value curve as well as the inclusion of 12.5 basis points for debt raising costs in IPART's determination of the debt margin. However Origin believes the varying maturity of the bonds sampled by IPART do not represent a robust benchmark and therefore an adjustment factor needs to be applied to reflect a ten year maturity to ensure the debt margin is consistent with the maturity of the Risk Free Rate, taking the debt margin to approximately 400 basis points; and
- IPART released a final decision on gamma in March 2012 which clearly states that the gamma factor should be lowered to 0.25 in future price determinations, this is not consistent with IPART's draft report of a gamma range of 0.5 to 0.3 for electricity generators. A gamma value of 0.25 should therefore be adopted.
- The standalone LRMC methodology understates the impact of the Clean Energy Act in the carbon inclusive energy price.
- The particular LRMC methodology used by Frontier understates the full cost of new entrant wind generation.

These issues are explained in more detail below.

Long Run Marginal Cost

Origin is concerned by the decrease in the energy cost component (excluding carbon). This is clearly being driven by the reduction in the LRMC calculation as modelled by Frontier. Origin believes this change is unrealistic and not supported by recent calculations of LRMC by other industry experts.

As an example, the table below highlights ACIL Tasman's LRMC modelling results as published in its report of October 2011 to the Australian Energy Market Commission (AEMC), *Wholesale energy cost forecast for serving residential users.*

Table 30 **Impact of a carbon price on LRMC of serving residential load – New South Wales**

	Unit	2011-12	2012-13	2013-14
No Carbon	$/MWh	$77.88	$81.28	$84.60
Year on year increase	%	N/A	4%	4%
Carbon	$/MWh	$77.88	$100.23	$104.74
Year on year increase	%	N/A	29%	5%
Increase due to carbon	$/MWh	N/A	$18.95	$20.14
Percentage increase	%	N/A	23%	24%
Pass-through of carbon cost	tCO_2-e /MWh	N/A	0.82	0.83

Data source: PowerMark LT modelling

Although ACIL Tasman's final estimates are for serving the New South Wales residential load rather than by distribution region and vary in quantum from Frontier's result, it is most important to recognise that they forecast a 4 per cent increase in LRMC in 2012-13, excluding carbon impacts. Furthermore, ACIL Tasman has recognised that:

> *"For New South Wales, the system LRMC increases slightly in the absence of carbon due largely to increasing gas and coal costs.*[1]*"*

The main reasons for the decline in the LRMC estimate determined by IPART are:

- the lack of consideration given to significant recent changes in fuel input costs; in its modelling; and
- the significant decrease in the weighted average cost of capital (WACC) calculation for electricity generators since the 2011 Annual Review.

This submission provides evidence why both factors need to be reconsidered but the nature of the LRMC model means it is impossible to isolate the impact of these changed variables. In the Final Decision, Origin expects Frontier to provide a sensitivity analysis to demonstrate clearly what is driving its final calculated change in LRMC.

Fuel Input costs

Market evidence clearly shows that there have been significant upward changes to gas and coal input costs due to LNG developments and the strength of the coal export market.

[1] ACIL Tasman, *Wholesale energy cost forecast for serving residential customers*, p60

Furthermore, Frontier needs to recognise that fuel costs will also increase in 2012-13 as a direct consequence of the introduction of a carbon scheme.

Frontier should further review both coal and gas fuel costs for its LRMC calculation rather than just update the previous year's report for inflation or cost index changes.

Gas prices

The gas fuel costs used by Frontier to calculate the LRMC are not cost reflective.

The major liquefied natural gas (LNG) developments in Queensland over the past two years have had a significant impact on the Queensland and New South Wales gas markets. The impact of LNG demand on gas prices was acknowledged by ACIL Tasman in its Final Report to the QCA for the 2011-12 BRCI price determination when it agreed with Origin's observation that:

> *"the gas prices from 2014 are too low and do not fully account for the Queensland liquefied natural gas (LNG) exports and high crude prices."*2

ACIL Tasman recognised the gas prices in its draft report were too low to reflect the current market but despite this, Frontier[3] has used the cost data from the Draft Report, instead of the ACIL Tasman Final Report (as used by the QCA in making its Final Determination).

Insufficient explanation is supplied as to why the Frontier report relies on the input costs from a draft report which was found to be in error when the final report is in the public domain. Origin believes the input cost data must be updated to those within the Final Report; this cost data is the most up-to-date and valid gas fuel costs available.

This request is consistent with the approach taken to LRMC input costs in previous regulatory decisions both in New South Wales and other jurisdictions.

Coal prices

Origin cannot accept the new entrant coal input costs as used by Frontier in the LRMC calculation.

First, Frontier was not inclined to use the coal prices adopted by ACIL Tasman for the QCA in its LRMC modelling as it would represent a significantly different approach from the 2010 IPART determination. This is attributed to the fact that ACIL had averaged the coal costs of existing generators.

However, Frontier have concluded that there were no appropriate sources of data for new entrant coal prices (having rejected the average coal price used by QCA and ACIL Tasman) and resorted to using historical data from the 2009 ACIL Tasman Report. Given the outdated nature of this report, IPART appears to have chosen to escalate the costs in line with average increases in mining cost indices over the previous ten years[4]. Reliance on outdated forecast coal prices from 2009 data is not adequate but escalating these prices using an historic 10 year average is meaningless.

Even a cursory examination of the current market for coal would highlight that Frontier's new entrant coal cost estimates of around $35 per tonne are only half of current netback export coal prices. Recent domestic coal supply agreements have been in the range of $70-$75/tonne.

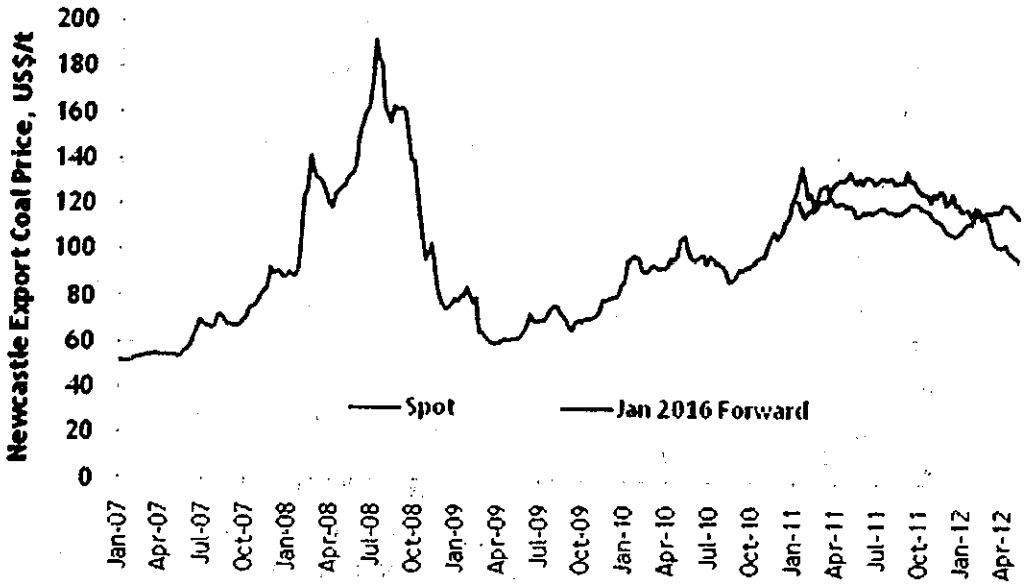
---

2 ACIL Tasman, *Calculation of Energy Costs for 2011-12 BRCI Final Decision*, 30 May 2011, page 16

3 Frontier, *Energy Costs, Annual Review for 2012/13*, April 2012,

4 A similar approach was taken in the 2011 Annual Review.

The export and domestic market for NSW coal are closely linked with rising export prices causing coal miners in NSW to seek higher prices for domestic coal. Over the last 3 to 5 years, the export price for coal has increased from $US40 a tonne to around $US 100 per tonne (see figure below) and this price increase has encouraged coal producers in NSW to prepare their coal for the export market. This is a common driver for coal mines in NSW. It is unlikely that a new coal power station in NSW would be able to obtain coal at historical domestic prices or at the unreasonably low cost that IPART is using. Indeed, referencing recent black coal generators market bid stacks give an implied coal cost of 200% of the figures assumed by Frontier.



This linkage was identified by ACIL Tasman in the report that Frontier has used as a major data source for fuel input costs:

> *"Coal prices into new entrant black coal fired power stations in NSW will be the most affected by the trend in the price of export thermal coal with new power stations expected to be dependent on new coal contracts largely linked to export prices."*[5]

This statement is also consistent with the market view that coal prices are on the rise to export parity and will typically impact local markets. ACIL Tasman's Final report to the QCA also identified that:

> *"Using another approach one might assume that all black coal for local generation is faced with export parity pricing of currently around $3.00/GJ."*

Frontier's short run marginal cost for Super critical black coal in NSW of $14.04/MWh for a new entrant equates to a cost of less than $1.50/GJ. This does not reflect the cost of export parity coal and is completely unrealistic given current market evidence. It is far too low to use in a LRMC calculation for coal fired generation in NSW.

WACC Calculation

Origin understands that, based on the provisions of the 2010 Determination, IPART has instructed its consultant Frontier to use a pre-tax real discount rate of 6.5 per cent in its modelling for the LRMC of generation.

---

5 Ibid 1, page 13

However, Origin is concerned that, insofar as IPART adopts a 20 day sampling period, it has not had regard to "efficient costs" as it is required to do under its Terms of Reference.[6] In fact, the 20 day sampling period is not appropriate given market conditions, which are discussed in more detail below. For the reasons set out below, Origin believes that the 20 day sampling period does not reflect what could be achieved by an efficient operator in the market (and thus does not reflect "efficient costs"). In that regard, that the draft report uses different sample periods for the WACC for generation and retail, whereas in previous decisions, the same sampling period were used. The use of different sample periods is significant because it shows large variations in resultant generation and retail WACC resulting from the difference in timing. Those variations highlight the inherent weakness of using the 20 day measurement period at the current time.

In previous decisions, the 20 day trading period has not been queried as the final WACC has appeared to be a reasonable estimation of efficient costs, particularly when compared to the economic environment at that time. However, the conclusion in the draft report that cost of equity and debt are significantly decreasing in not consistent with Origin's view of the state of the equity and debt markets and requires further analysis.

Accordingly, Origin engaged PricewaterhouseCoopers (PwC) to provide advice on key inputs to the WACC calculation namely:

- Risk Free Rate;
- market risk premium;
- the cost of debt; and
- Gamma.

This report by PwC is attached to this submission[7].

Although Origin agrees in principle with the methodology that IPART has applied to determine the WACC and with the use of Capital Asset Pricing Model, Origin makes the following submissions on the estimation of some components of the WACC (especially the Risk Free Rate) and provides reasons why the final WACC result is not reflective of a market WACC in the current economic environment.

Risk Free Rate

Origin agrees the market proxy for Risk Free Rate used by IPART being the 10 year Australian Government Bond is the most appropriate. As at 3 February 2012, IPART has measured the 20-day average of the 10 Year Australian Government Bond Rate to be 3.8 per cent.

Due to the current uncertainty in relation to the European Debt Crisis a "flight to quality" has been observed and the 10 year Australian Government Bond Yields have fallen abnormally over a short period of time. Despite this fall, it is not clear that such a decrease is reflected in the cost of equity (of which the Risk Free Rate is a major component). The use of a 20 day averaging period in the current market environment abnormally impacts on the Risk Free Rate.

The fall in the Risk Free Rate has not been reflected in a fall in the required returns of equity holders (cost of equity). This is demonstrated by the increase in the spread between the indexed 10 year Government Bonds rates and the forecast dividend yields (as illustrated by Figure 2 in PwC's report). This implies that in times of uncertainty, equity market valuations decrease due to the requirement for greater returns on equity

[6] Terms of Reference, section A.1.2.

[7] PwC, *Review of IPART Draft WACC calculation*, May 2012.

(proxied in this instance by the forecast dividends) resulting in increased dividend yields during times of uncertainty.

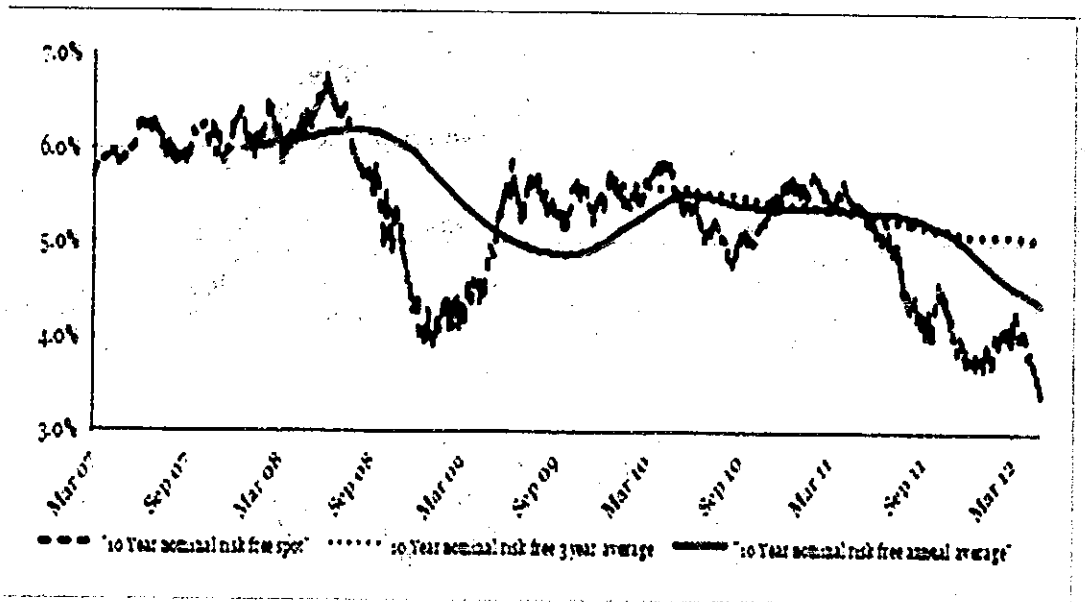
This is confirmed by PwC (in page 8 of its report):

> *"While lower equity market values in recent years reflect in part investor assessments of likely future cash flows, the current state of equity markets is not consistent with the view that the significantly lower Government Bond rates have resulted in a significantly lower cost of equity. Instead it appears that Government Bond rates in Australia (along with a number of other major markets including the USA and UK) are abnormally low reflecting "flight to quality" among investors in response to global economic uncertainty, leading to an additional premia being sought by investors in other asset classes."*

Due to the disconnect between the decrease in current Australian Government Bond Yields and the impact on the cost of equity, an upward adjustment to the Risk Free Rate is required. PWC consider that:

> *"...it is not appropriate to use the observed spot Government Bond rate, or a short term moving average of 20 days, as the basis for determining the Rf in conjunction with the estimate of MRP and inflation as adopted in the IPART draft report. In terms of adjustment to reflect the abnormally low level of Government Bond yields, this could be made by:*
>
> - *Adding an amount to the spot measure of Rf; or*
> - *Adjusting the measure of MRP used to reflect an additional short term component of risk over and above the depressed measure of Rf.*
>
> *One way to consider such normalised levels of Rf rate is to look at Government Bond rates based on rolling average yields over periods of one year and three years. This approach is effective in eliminating distortions from short term declines (or spikes) in bond rates."*

The chart below provides a summary of the spot 10 year Government Bond rates as well as the one year and three year moving averages. The adoption of one year or three year moving average would represent a Risk Free Rate of 4.5 per cent or 5.0 percent respectively.



Source: RBA statistics, Bloomberg, PwC analysis

An alternative method for determining a normalised view of 10 Year Australian Government Bond Yields is to make an assessment of the individual components being the "implied real Risk Free Rate" and "implied inflation expectations". PwC has undertaken this analysis in its report and derive a normalised estimate of Risk Free Rate of 5.0 per cent as at 5 May 2012.

An upward adjustment should be made to normalise the Risk Free Rate for its use in a WACC. Consistent with PwC's view, Origin proposes that a Risk Free Rate of 5.0 per cent is more appropriate for use in the determination of the WACC than using the current Yield of 10 Year Australian Government Bonds. The current flight to quality by investors has cause a depression in yields which is not reflective of a reduction in the cost of equity.

Market risk premium (MRP)

Long term estimates of MRP for the Australian market typically have been 6 per cent, which is consistent with IPART's estimation of 5.5 per cent to 6.0 percent in the draft report. However, there is inconsistency in the way IPART is applying the longer term measure of MRP with a shorter term measure of Risk Free Rate in the WACC. PwC have considered and conclude that:

> *"If a long term MRP is applied, and then a long term Rf rate must also be applied, otherwise the resulting estimated rate of return will under-estimate the required rate of return. Alternatively, it would be necessary to apply a short term market risk premium in conjunction with the observed short term Risk Free Rate, rather than the long term rate."*

PwC further highlights that the response of leading independent experts to the recent market conditions has been to make an upward adjustment in the Risk Free Rate applied to determine the cost of equity when the discounted cash flow (DCF) methodology has been applied in mergers and acquisitions. Origin refers IPART to a number of examples from the recent independent expert reports which are discussed in more detail in the PwC report.

There is currently an inconsistency between the MRP and Risk Free Rate being applied by IPART in the determination of WACC. The MRP currently being used by IPART is a longer term measure of MRP and is therefore, it is appropriate when used in conjunction with a normalised longer term view of the Risk Free Rate (which Origin do not believe IPART is currently doing). If IPART were to continue to use a short term measure of Risk Free Rate (such as the 20 day period IPART is currently using), then IPART should combine this with a short term MRP of at least 7 per cent to reflect the required return demanded by equity investors in the current economic environment.

Debt margin

IPART's estimate of the generator's debt margin of 2.4 per cent to 3.9 per cent in their draft report is based on:

- A sample of securities from the Australian bond market with a credit rating of BBB to BBB+ and which have at least 2 years to maturity;
- Including the Bloomberg 7-year BBB fair value curve in the sample; and
- The yields are expressed as a margin over the Risk Free Rate and include 12.5 basis points for debt raising costs.

Origin agrees that the Bloomberg 7 year BBB fair value curve represents an appropriate benchmark for setting the debt margin, but is concerned that the group of bonds sampled by IPART for generation assets have varying dates to maturity. All of the bonds selected by IPART have less than 10 years to maturity and only two bonds are longer than 7 years

to maturity. PWC observes that in the sample of bond used for Generation, there is a significant price differential between bonds by the same issuer but with different maturity, specifically:

- The three year difference between the maturity of the Sydney airport bonds results in a 77.8 basis point price differential; and
- The 1.5 year difference between the maturity of the Mirvac bonds results in a 58.5 basis point differential.

Since the 10 year Australian government bond is used as a proxy for determining the Risk Free Rate, the debt margin should also be estimated based on corporate bonds with a maturity as close to 10 years as possible.

IPART should apply the Bloomberg 7 year BBB fair value curve and apply an adjustment factor of 15 to 25 basis points per annum to reflect a 10 year tenor of the Australian government bond, and should also include an allowance for debt raising costs.

Assumed Level of Gearing

The IPART draft report adopts a gearing of 50 per cent for generation which is more akin to project finance deals and is inconsistent with other parameters used to calculate the WACC. This level of gearing is clearly inconsistent with the BBB and BBB+ rated bonds referenced by IPART. Gearing levels for large Australian energy utilities with BBB rating are currently in the range of approximately 15 to 25 per cent.

This is another input assumption that is not realistic and should be reconsidered by IPART.

Gamma factor

The IPART draft report adopts a gamma factor in the range of 0.5-0.3, denoting that the applied range is the same range as that used previously. However this measure is different to IPART's final decision presented in *'Review of imputation credits (gamma) - Research - Final Decision'* (the IPART Gamma Report), which was released in March 2012. In the IPART Gamma Report, IPART concludes on applying a gamma of 0.25 for future price determinations and this is discussed by PwC in its report.

Given IPART's previous decision is to use a gamma value of 0.25 in future price determinations, the gamma factor in the IPART Draft Report should be lowered to 0.25.

Cost of Carbon

The nature of the Stand Alone LRMC methodology builds an efficient generation portfolio for the given input conditions from a green-field base. This particular aspect of the Stand Alone LRMC methodology has been less of an issue previously where the year on year changes to input costs are significantly less disruptive to the optimal plant mix than the introduction of the $23/tCO2-e carbon price. The issue being that the optimal generation fleet arising with and without the impost of the carbon tax are materially different, therefore not reflecting the burden of carrying the existing fleet in a carbon constrained environment. We note that Frontier has separately assessed the carbon uplift in the spot market to be approximately 1.0 tCO2-e/MWh which is more reflective of the impact of the existing generation fleet than the result from the Stand Alone LRMC methodology.

Market-based Calculation

The terms of reference to IPART for the 2010 Determination required the regulated retail prices for 2010-2013 to be based on either the LRMC of electricity supply or the market-based purchase costs, whichever is the greater. For the duration of the Determination,

the market-based purchase cost has had little impact upon final electricity prices. For this reason, little comment has been provided on Frontier's market based approach.

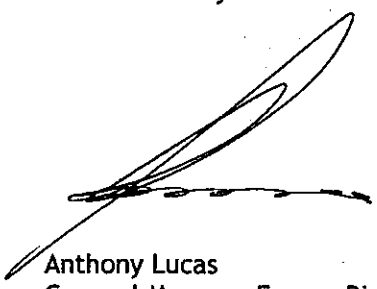
However, it is pertinent in the final year of the determination to highlight Origin has concerns with the model used by Frontier in calculating the market-based energy purchase costs. One key concern being that this market-based cost is generally not representative of a retailer's actual costs as it tends to simplify the approach to risk taken by a retail business. Going forward, Origin would appreciate an opportunity to discuss this in more detail with IPART.

Cost pass through Applications

Origin supports the cost pass through process undertaken by IPART and is pleased the full cost incurred by Standard Retailers for the small-scale renewable energy scheme (SRES) has been recovered in the 2012-13 prices.

If you have any questions, please contact me on (02) 9503 5488 or Patrick Whish-Wilson on (07) 3867 0620.

Yours sincerely



Anthony Lucas
General Manager Energy Risk Management

pwc.com.au

Origin Energy Limited

Review of IPART Draft WACC calculation

May 2012

pwc

Private & Confidential

Mr Luke Adams
Manager, Corporate Finance
Origin Energy Limited
Level 45
264-278 George Street
Sydney, NSW 2000

10 May 2012

Dear Luke

Review of IPART's draft WACC calculation

In accordance with our engagement letter dated 4 May 2012, we enclose our report reviewing the calculation of WACC in IPART's Draft Pricing determination dated April 2012.

Please contact me if you have any queries.

Yours sincerely

Partner
Advisory Services
richard.j.stewart@au.pwc.com
T: +61282668839
F: +61282868839

Contents

1 Scope of work

1.1 Scope

Origin Energy Limited (Origin) has engaged PricewaterhouseCoopers (PwC) to provide advice to in relation to certain aspects of the draft report *Changes in regulated electricity retail prices from 1 July 2012* prepared by the Independent Pricing and Regulatory Tribunal (IPART)(the IPART Draft Report).

Specifically, Origin requires us to comment on the key inputs to the Weighted Average Cost of Capital (WACC) calculation as set out in Appendix B of the IPART Draft Report:

1) Nominal risk free (Rf) rate;
2) Market risk premium (MRP);
3) The applicability of the debt margin applied given the assumed level of debt to total assets (Gearing); and
4) Gamma.

As instructed by Origin, we have not provided comment on other inputs to the WACC such as the tax rate, inflation rates, and the equity beta. In addition, we have not commented on the mathematical accuracy of the calculations.

Table 1 below is an excerpt from the IPART draft report providing a summary of the key inputs to the draft decision real pre-tax WACC of 6.5% and 7.6% to apply to electricity generation and retail respectively to update the energy cost allowance for 2012/13.

Table 1 –Draft decision for the electricity generation and retail WACC

Component	Generation	Retail
Nominal Rf rate	3.8%	4.1%
Inflation	2.8%	3.0%
MRP	5.5%-6.5%	5.5%-6.5%
Debt margin	2.4%-3.9%	2.5%-3.9%
Debt to total assets (Gearing)	50%	30%
Gamma	0.5-0.3	0.5-0.3
Tax rate	30%	30%
Equity beta	0.9-1.1	0.9-1.1
Cost of equity (nominal post-tax)	8.8%-11.0%	9.1%-11.3%
Cost of debt (nominal pre-tax)	6.2%-7.8%	6.6%-8.0%
WACC range (real pre-tax)	5.3%-7.8%	6.2%-9.1%
WACC mid-point (real pre-tax)	6.5%	7.6%

Source: IPART draft report, Appendix B, page 96

1.2 Limitations on use and reliance on this report

This report has been prepared solely for the purpose set out above, and should not be relied upon for any other purpose.

Whilst Origin has commissioned this report to be included in its submission to IPART, and we have consented to its inclusion in their submission, we accept no responsibility for the report to any other party other than Origin.

2 Nominal Rf rate

2.1 Nominal Rf rate

2.1.1 IPART methodology to estimate nominal Rf rate

Page 96 of the IPART draft report sets out the following:

- *"We have updated the market-based parameters, using the same methodology as was applied in the 2010 determination."* (the IPART 2010 Final Report)[1]

IPART's methodology to estimate the Rf is based on:

- An estimate of the 10-year nominal Rf rate from the 20-day average of the yield on nominal Commonwealth Government bonds (Government Bonds); and
- Swap market data over a 20 day-day sampling period to derive a 10-year forecast of inflation.

In applying its methodology, the IPART draft report sets out a Rf for Generation and Retail to be as follows:

- 3.8% for Generation, based on market parameters sampled to 3 February 2012; and
- 4.1% for Retail, based on on market parameters sampled to 19 March 2012.

The 20 day average 10 year Government Bonds rate as at 4 May 2012 was 3.8% and the current yield on Government Bonds at 4 May 2012 was 3.6% reflecting significant declines in yields during the prior one to two years. Specifically, the current yield at 4 May 2012 compares to yields of 5.2% at 30 June 2011 and 5.5% at 31 December 2010.

2.1.2 Comments of IPART's Rf

Rf as a component of the CAPM

The basic expression of the Capital Asset Pricing Model (CAPM) estimates the cost of equity by reference to the premium over the Rf rate that an investor will require to invest in a particular equity. This premium is determined based on the average premium over the Rf rate estimated to be required by investors across the listed equity market (the equity market risk premium or MRP) multiplied by a beta factor reflecting the systematic risk of a particular equity.

To the extent that estimates of MRP are typically based on long term measures of excess returns for the equity market, the basic expression of CAPM implies that movements in the overall values of the market will be driven by:

- Movements in the Rf rate (which in Australia is typically measured based on the yield of a 10 year Government Bonds)

[1] IPART, Review of regulated retail tariffs and charges for electricity 2010-2013 – Final Decision, March 2010, which reflects market data up to 8 February 2010.

- Movements in market estimates of the future company cash flows (representing movements in real cash flows and inflation)

This relationship indicates that if the Rf rate declines, the cost of capital should also decline. As such, if the cost of capital declines, then ceteris paribas, equity values should increase.

However, these simplistic inferences will not necessarily apply since:

- As noted above, equity prices reflect assessments of long term future cash flows that are constantly being updated by investors. Hence, in our discussion below of future cash flows, we proxied these changes by using forecast rather than historical dividends.

- Interest rates and yields are influenced by central bank policy which is typically counter cyclical due to the imperatives of managing monetary policy based on inflation targeting. For example, when economic prospects are strong (and equity markets high), monetary policy would tend towards increasing interest rates, while in a period of weaker economic outlook, there would be a tendency to lower interest rates. This monetary policy direction is consistent with broad market direction in interest rates associated with supply and demand for credit. Therefore, theoretical valuation adjustments arising from major movements in Rf rates are countervailed by changes in the pricing of equity market risk to some extent.

Accordingly, while it is not possible to estimate MRP at any given point with precision, movements in government bond rates are partly balanced by offsetting movements in MRP and that the overall cost of equity is more stable than its individual components. This would be consistent with the fact that Australian share markets have not risen in line with significant fall in Government Bond yields.

Use of 20-day average of Government Bond yields

We agree that the Rf to be used in the expression of a CAPM for the Australian market should be based on 10 year Government Bonds. However, we provide the following comments in respect of IPART's use of a shorter term measure of Rf (20 day average), specifically in light of the current market conditions.

During the last four years there has broadly been a downward trend in the yield on the 10 year Government Bonds. This trend in interest rates is consistent with the countervailing nature of central bank policy during a period in which there has been a significant downgrading in the outlook for the global economy (and hence a decline in equity markets). However, it is noteworthy that during this period there have been two periods of rapid decline and very low absolute rates:

- The second half of 2008 as the seriousness of the crisis in the US banking system became apparent following the collapse of Lehman Brothers with Australian Rf rates briefly declining below 4% in January 2009

- The past year during which the seriousness of the issues facing European economies and the problems of the Euro zone have been more fully recognised by the financial markets.

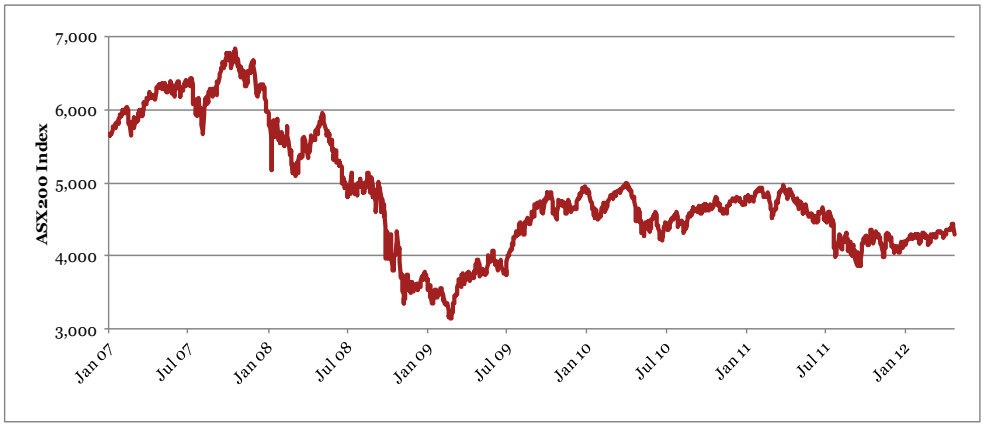
Flight to quality

The market response to both these crises has been a "flight to quality" as domestic and international investors sought out lower risk investments and hence Government Bond yields have declined rapidly.

The "flight to quality" represents additional demand for risk free investments in a time of economic uncertainty, however, the impact of this "flight to quality" on Government Bond yields is not a reflection that the return required to hold equities and similar risky assets has declined significantly in line with the fall in Government Bond yields during the period. Instead, there is a strong basis to consider that the Government Bond yield reflects an abnormally low measure of Rf rate during such periods reflecting factors that would not necessarily be expected to feed through into a lower cost of equity.

Figure 1 below sets out the ASX 200 over the period 1 January 2007 to 4 May 2012.

Figure 1 – ASX 200 since January 2007

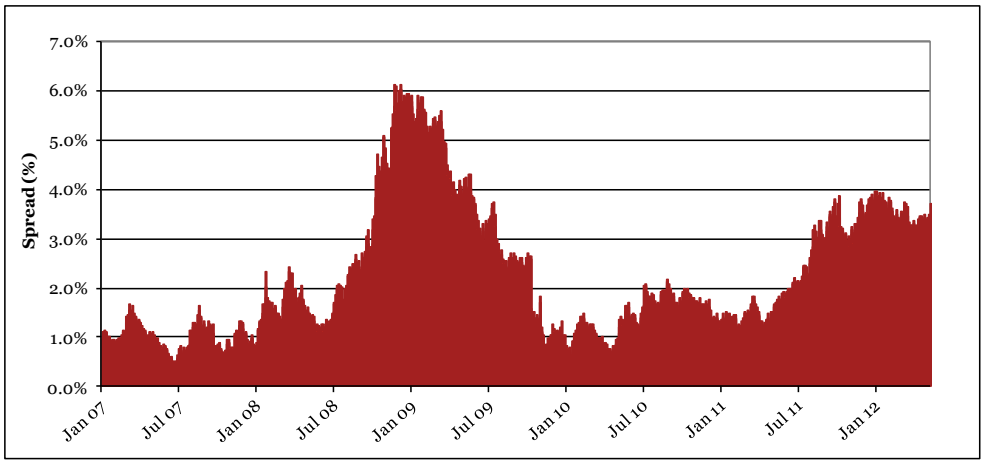


Source: Bloomberg

The past four years has seen a decline in equity markets. In the period up to March 2009 there was a significant decline followed by a recovery characterised by continuing volatility. At 4 May 2012 the ASX 200 was 33% below its level at 1 January 2008, but 35% above the low point in March 2009. Over the preceding year, the ASX 200 index declined from 4,754 to 4,396[2].

Figure 2 below provides a comparison of the Indexed 10 year Government Bonds rate compared to the forecast dividend yields of the All Ordinaries index for the period 1 January 2007 to 4 May 2012.

Figure 2 - Spread between the Indexed 10 Year Government Bond and All Ordinaries Forecast Dividend Yield



Source: RBA statistics, Bloomberg, PwC analysis

[2] Figures presented reflect the closing value of the ASX-200 on 5 May 2011 and 4 May 2012 respectively.

As shown in the graph above, the spread between the indexed 10 year Government Bonds rates and the forecast dividend yields have increased since August 2011 (as was also the case for the period September 2008 to June 2009). The implication of this analysis is that in times of uncertainty, equity market valuations decrease due to the requirement for greater returns on equity (proxied in this instance by the forecast dividends) resulting in increased dividend yields during times of uncertainty.

Key point

While lower equity market values in recent years reflect in part investor assessments of likely future cash flows, the current state of equity markets is not consistent with the view that the significantly lower Government Bond rates have resulted in a significantly lower cost of equity. Instead it appears that Government Bond rates in Australia (along with a number of other major markets including the USA and UK) are abnormally low reflecting "flight to quality" among investors in response to global economic uncertainty, leading to an additional premia being sought by investors in other asset classes.

Accordingly, we consider that it is not appropriate to use the observed spot Government Bond rate, or a short term moving average of 20 days, as the basis for determining the Rf in conjunction with the estimate of MRP and inflation as adopted in the IPART draft report.

In terms of adjustment to reflect the abnormally low level of Government Bond yields, this could be made by:

- Adding an amount to the spot measure of Rf; or
- Adjusting the measure of MRP used to reflect an additional short term component of risk over and above the depressed measure of Rf.

Normalising Rf

One way to consider such normalised levels of Rf rate is to look at Government Bond rates based on rolling average yields over periods of one year and three years. This approach is effective in eliminating distortions from short term declines (or spikes) in bond rates.

Figure 3 provides a summary of the spot 10 year Government Bond rates as well as the one year and three year moving averages.

Figure 3 – Rolling average nominal 10 year Government Bond yields

Source: RBA statistics, Bloomberg, PwC analysis

As shown above, the rolling average over a one year and three year period results in an estimate of normalised Rf rate of slightly below 4.5% and 5.0% respectively at 4 May 2012. Either of these data points provide a normalised longer term measure of Rf rate, but is still heavily influenced by the extended "flight to quality" in response to the Euro crisis.

Analysing the components of Rf

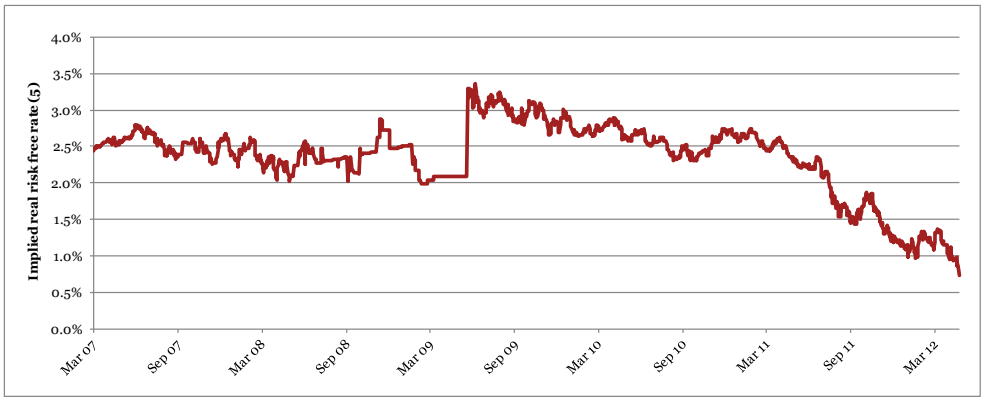
In addition for the purposes of considering a normalised Rf rate at a current date, it is appropriate to estimate a longer term measure of the real Rf rate and the financial market estimate of future inflation. The yield on Government Bonds has two components being a real yield and a long term inflation estimate.

To infer the real Rf rate implied in the government bond yield, we have analysed indices for government nominal bonds and inflation linked government bonds. Reviewing data available on Bloomberg, the most meaningful time series is depicted by indices for these bonds with a 10 year term.

As analysed below, the significant decline the nominal government bond yield over the past year has largely been driven by the decline in the real Rf rate. At 5 May 2012, the real Rf rate implied by 10 year bonds was 1.3%. This is historically low and compares with a typical range for the real Rf rate implied by 10 year bonds being in the range 2.0% to 3.0% over most of the period since 1 January 2008. In particular, the real Rf rate is significantly below that in late 2008, when very low nominal yields reflected very low inflation estimates.

Figure 4 sets out the historical implied real Rf rate since January 2007.

Figure 4 – Implied real Rf rate



Source: RBA statistics, Bloomberg, PwC analysis

Data for the real Rf rate in early 2009 incorporates a "gap" due to the lack of trading in the index linked bond during this period. Specifically, between March and May 2009 the index linked bond did not trade and hence movements in the market Rf rate over that period only become apparent when the index linked bond traded again in June 2009.

The very low level of current real return implied by the above analysis is consistent with the view that there has been a significant "flight to quality" with investors accepting a significantly lower real return in compensation for the greater security offered by a government backed bond.

The same analysis also indicates that current financial market estimates of inflation of around 2.7% as at 4 May 2012 is within the range for the financial markets estimates observed over the past four years (and the RBA stated target for inflation of 2% to 3%).

Figure 5 sets out the implied inflation expectation since January 2007.

Figure 5 – Implied inflation expectation

Source: RBA statistics, Bloomberg, PwC analysis

To estimate a normalised level of nominal Rf rate, we have:

- Based the inflation measure on the estimate of 2.5% based on the recent observed range of inflation estimates;
- Based our estimate of the real Rf rate component of nominal Rf rate on a broad average measure of real Rf rate across the period from 2.5% derived in the above analysis of nominal and inflation linked 10 year bonds; and
- Applied the Fisher equation to derive an estimated normalised nominal Rf rate.

In its decision on the Sydney Desalination Plant (SDP), IPART decided to depart from applying the indicated short term nominal Rf rate of 3.9%, and instead adopted a long term parameter value of 5.4%.[3] As a result, the mid-point WACC determined by IPART was increased by 80 bps. IPART explained that this approach was necessary in the current market circumstances: [4]

- For this review, we consider that the value of the Rf rate is currently well below long term averages and that there is a high level of market uncertainty. We consider the risks of setting a 5-year determination in the current conditions are more significant than under normal market conditions; and
- Therefore, to guide our view on the point estimate for the WACC, we estimated the long term averages of the Rf rate, inflation rate and the MRP.

Based on the above analysis, we derive a normalised estimate of Rf rate of 5.0% as at 5 May 2012.

3 IPART (December, 2011), *Review of water prices for Sydney Desalination Plant Pty Limited – From 1 July 2012, Water – Final Report*, pp. 94-95.

4 IPART (December, 2011), pp.93-94.

Conclusion

Analysing an expected longer term level of Rf rate, we have considered the financial market estimate of inflation of 2.5% inherent in the yields on nominal and inflation linked Australian Government bonds (which is consistent with the long term target range for inflation in Australia).We have also reviewed the level of real Rf rates in Australia over the past five years. Apart from the second half of 2011, real Rf rates have typically been in the range 2% to 3%.

Accordingly, when the Rf rate is depressed, as is currently the case, we consider that it is not appropriate to use the observed spot Government Bond rate, or a short term moving average of 20 days, as the basis for determining the Rf in conjunction with the estimate of MRP and inflation as adopted in the IPART draft report. As noted by IPART in its SDP decision in December 2011, it is more important to adopt long term parameters for Rf and the MRP, and estimate a cost of equity that will be more reflective of the cost of raising equity capital in the current market.

Combining the financial market estimate of inflation of 2.5% and a real Rf rate of 2.5% implies a longer term Rf rate for Australia in the order of 5.0% or approximately 1.4% above the spot Government Bond yield at 4 May 2012.

3 Market risk premium

3.1.1 Comments on IPART's MRP

MRP as a component of the CAPM

Market risk premium (MRP) is a measure of the long term excess return earned on a diversified portfolio of equities inferred from comparison of long term equity returns and the returns available on risk free investments represented by Government Bonds. Inevitably this measure will be extremely volatile over short and medium term periods and hence estimates of MRP typically refer to excess returns over very long periods.

Long term estimates of MRP for the Australian market typically have been 6% as reflected in:

- The general adoption of the rate of 6% in more normal market conditions by Australian valuers and regulators; and
- Academic research covering the period 1883 to 2010 which indicates an MRP in the order of 6% where no value is explicitly modelled for imputation credits.

Regulators also give some weight to forward looking or ex ante estimates, which tend to be less than 6%.

The most pertinent question in today's market is whether, if a long term MRP is applied in the CAPM formula to derive a rate of return, it is appropriate to pair a long term MRP with a 'short term' Rf rate. If a long term MRP is applied, and then a long term Rf rate must also be applied, otherwise the resulting estimated rate of return will under-estimate the required rate of return. Alternatively, it would be necessary to apply a short term MRP in conjunction with the observed short term Rf rate, rather than the long term rate.

Evidence from independent expert reports

It is noteworthy that since mid 2011, when deteriorating international financial market conditions resulted in a precipitous decline in the 10 year Government Bonds rate, there has been a response among Australian market participants who are deciding the disposition and valuation of billions of dollars of investments in a wide range of industries. In valuing the assets that are being exchanged in mergers and takeovers, the response of leading independent experts has been to make an upward adjustment in the Rf rate applied to determine the cost of equity when the discounted cash flow (DCF) methodology has been applied.

We have reviewed certain assumptions employed in the WACC calculation of various independent expert reports in respect of market based transactions across a wide range of industries.

Table 2 provides a summary of the assumed Rf rate, and other inputs adopted in all of the independent expert reports for Australian based transactions in excess of $150 million since October 2011 that applied a CAPM methodology (excludes the property sector).

Table 2 – Rf and other inputs adopted in Independent Expert Reports

Entity	Date of Report	Author	10 Year Govt Bond Rate (Spot)	Adopted Rf	Implied premium above spot rate	MRP
Gloucester Coal Ltd	April 2012	Deloitte	4.39%	4.44%	0.05%	7.0%
Ludowici Ltd	April 2012	Grant Thornton	4.06%.	4.6%	0.54%.	6.0%
Aston Resources Ltd	March 2012	PwCS	4.0%	5.1%	1.1%	6.0%
oOh!median Group Ltd	January 2012	Grant Thornton	3.83%	5.0%	1.17%.	6.0%
Murchison Metals Ltd	January 2012	KPMG Corporate Finance	3.9%	4.8%	0.9%	6.0%
Brockman Resources Inc	December 2011	Deloitte	3.86%	4.1%	0.24%	6.0%
AUSTAR	December 2011	Grant Samuel	3.92%	4.5%	0.58%	6.0%
Bow Energy Ltd	November 2011	Grant Samuel	4.07%	4.5%	0.43%	6.0%
Fosters Group Ltd	October 2011	Grant Samuel	4.38%	4.5%	0.12%	6.0%
Coal & Allied Industries Ltd	October 2011	Lonergan Edwards	4.2%	5.0%	0.8%	6.0%

Source: Company filings, RBA statistics

As shown above, a number of the reports reference the use of a Rf rate other than the current spot Rf rate due to the current lower-than-normal level of the Australian governement bonds. In one instance a MRP of 7% is adopted.

Deloitte (Gloucester Coal Ltd): *"Since there is no zero coupon government bond issued by the Australian Government, we have utilised the zero coupon bond yield calculated by Thomson Reuters, which excludes the coupon payments from the 10 year Australian Government Bond. In determining Rf we have taken the 5-day average of the zero coupon 10-year Australian Government Bond yield for the period of 20 March 2012 to March 26 2012. In recent years it has been common market practice in Australia in expert's reports and regulatory decisions to adopt an MRP of 6%. Having considered the various approaches and their limitations, we consider a MRP of 7% to be appropriate."* (page 284 of Explanatory Statement dated 30 April 2012)

Grant Thornton (Ludowici Ltd): *"Given the current volatility in the global economy due to the uncertainty associated with European debt markets, we have observed the yield on the 10 year Australian Commonwealth Government Bond over a longer period. Based on the average yield for the period 1 March 2011 to 1 March 2012, we have adopted a risk free rate of 4.6%."* (page 233 of Scheme Booklet dated 10 April 2012)

PwCS (Aston Resources Ltd): *"Combining the financial market estimate of inflation of 2.5% and a real risk free rate of 2.6% implies a longer term Rf rate for Australia in the order of 5.1%. For the purposes of estimating the cost of equity, we have added an amount to Rf and retained the long term measure of MRP"* (page 218 of Scheme Booklty dated 9 March 2012)

Grant Thornton (oOh!median Group Ltd): *"Based on the average yield for the period 1 January 2011 to 12 December 2011, we have adopted a Rf rate of 5%."* (page 147 of Scheme Booklet dated 20 January 2012)

KPMG (Murchison Metals Ltd): "We have applied an additional specific adjustment of 0.9% per annum in relation to the Australian risk free rate." (pages 81 and 86 of Explanatory Memorandum dated 3 January 2012)

Deloitte (Brockman Resources Limited): "*Since there is no zero coupon government bond issued by the Australian Government, we have utilised the zero coupon bond yield calculated by Thomson Reuters, which excludes the coupon payments from the 10 year Australian Government Bond. In determining Rf we have taken the 5-day average of the zero coupon 10-year Australian Government Bond yield for the period of 5 December 2011 to 9 December 2011.*" (page 79 of Targets Statement dated 21 December 2011)

Grant Samuel (AUSTAR United Communications Ltd): *"Grant Samuel has adopted a risk free rate of 4.5%. The risk free rate approximates the current yield to maturity on ten year Australian Government bonds."* (page 136 of Scheme Booklet dated 15 December 2011)

Grant Samuel (Bow Energy Ltd): *"Grant Samuel has adopted a risk free rate of 4.5%. The risk free rate approximates the current yield to maturity on ten year Australian Government bonds. The yield to maturity on ten year Australian Government bonds declined sharply (from around 5%) with the downturn in global capital markets (and the associated increased volatility) in August 2011."* (page 165 of Scheme Booklet dated 17 November 2011)

Grant Samuel (Fosters Group Ltd): *"Grant Samuel has adopted a risk free rate of 4.5%. The risk free rate approximates the current yield to maturity on ten year Australian Government bonds."* (page 165 of Explanatory Booklet dated 27 October 2011)

Lonergan Edwards (Coal & Allied Industries Ltd): *"If we were to adopt a risk free rate of 4.2%, in our opinion it would be appropriate to adopt a correspondingly higher market risk premium."* (page 98 of Scheme Booklet dated 24 October 2011)

Conclusion

A long term MRP must be coupled with a long term Rf rate. If the short term Rf rate declines markedly in response to current world financial market difficulties, it is necessary to either apply the long term MRP of 6 per cent as well as a long term Rf rate (i.e. the current spot rate plus an uplift to equal the long term Rf rate), or the current spot Rf rate applied to a current MRP that is higher than the long term MRP (i.e. higher than 6 per cent).

4 Debt margin

4.1.1 IPART's methodology to estimate debt margin

Page 97 of the IPART draft report sets out the following:

- *"Due to changes in the Australian bond market since [the IPART 2010 Final Report], we have not been able to set the debt margin using the same sample of bonds. However, we have applied the same principles as were used in [the IPART 2010 Final Report] to update the debt margin valuation."*

IPART's methodology to estimate the debt margin is based on:

- A sample of securities from the Australian bond market with a credit rating of BBB to BBB+ and have at least 2 years to maturity;
- Including the Bloomberg 7-year BBB fair value curve in the sample; and
- The yields are expressed as a margin over the Rf rate and include 12.5 basis bps for debt raising costs.

In applying its methodology, consistent with the IPART 2010 Final Report, the upper, lower and midpoint values derived from the sample of securities are inputs to the IPART draft report WACC calculation.

The IPART draft report sets out a debt margin for Generation and Retail to be follows:

- 240 basis points (bps) to 390 bps for Generation, or 315 bps at the midpoint; and
- 250 bps to 390 bps for Retail, or 320 bps at the midpoint.

The IPART draft report sets out on page 96, that *"the lower discount rate [than that determined in 2011) is a reflection of currently low levels on bond yields."*

4.1.2 Comments on IPART's methodology

Use of the Bloomberg Fair Value Curve

While the Bloomberg fair value curve does occasionally depart from providing debt risk premium information that is reflective of the current market, it has a series of advantages and it would be reasonable to continue to take it into account when assessing the debt risk premium. The main advantage with the Bloomberg fair value curve is that it is an observable benchmark, and is simple to apply. Bloomberg imposes a series of tests to ensure that the data that it applies is of sufficient quality, and it is this screening process that has led to its current problems, since it has not included all of the new bonds that have been issued.

Bloomberg derives particular strength from these last two points. Within the Australian regulatory framework for setting prices, the last formal opportunity that regulated businesses have to comment on the WACC is some four or five months before the WACC is locked in, and during which time markets can change materially. Since the Bloomberg fair value curve is observable and Bloomberg is careful about taking account of new evidence, it has allowed regulators (at least prior to the global financial crisis) to commit to using the Bloomberg curve in

advance without requiring a detailed analysis of the outcomes in a particular averaging period.

The Australian Competition Tribunal's recent decisions

The Australian Competition Tribunal (the Tribunal) has recently given strong endorsement to the application of the Bloomberg fair value in appeals against decisions on the debt risk premium made by the Australian Energy Regulator (AER). For example, the Tribunal provided Jemena with a debt risk premium of 434 bps (based on the extrapolated Bloomberg fair value curve), with the Tribunal concluding that:[5]

The Tribunal emphasises that it is important for the AER to estimate the DRP and other WACC components with rigour and transparency, using comprehensive market-accepted data and offering some degree of certainty about the way in which it will apply the various estimating formulae (including the DRP formula) to a regulated company. Its estimating practices, data sources and reference periods must be well articulated, consistent and communicated to the parties and must, generally speaking, follow the precedents well-established in previous decisions made by the Tribunal in Application by ActewAGL Distribution and Application by Jemena Gas Networks (NSW) Ltd (No5).

Tribunal stated that sound reasons would need to be provided for the AER to depart from its previous practice of accepting the Bloomberg fair value curve.[6] In its recent final decisions on Powerlink and Aurora Energy, the AER abandoned its previous approach, which looked at a sample of bonds of varying maturities and took a simple average, and adopted an approach that extrapolates the Bloomberg 7 year BBB fair value curve to 10 years.[7] This is at odds with the methodology being applied by IPART in its draft decision, which resembles the AER's previous approach.

The validity of IPART's bond sample

We note that the bonds in IPART's bond sample are of a varying date to maturity, as set out in table 3 and table 4 for generation and retail respectively.

---

5 Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 4 (6 January 2012), para. 461.

6 Application by Envestra Limited (No 2) [2012] ACompT 4 (11 January 2012), para. 120.

7 AER (April, 2012), *Powerlink Transmission Determination 2012-13 to 2016-17*; AER (April, 2012), *Final Distribution Determination Aurora Energy Pty Ltd 2012-13 to 2016-17.*

Table 3 – Summary of IPART bond sample for Generation

Security	Ticker	Credit rating (S&P/Moody's/Fitch)	Maturity	Observation for 20 days to 3 Feb 12 years to maturity	average yield (%)
Bloomberg 7 year BBB fair value curve	C3567Y index	n/a	n/a	n/a	7.3051
Leaseplan Aust	EI579028 Corp	BBB+/A3/BBB+	24/02/2014	2.06	6.6536
Mirvac	EI195249 Corp	BBB	15/03/2015	3.11	6.5156
Sydney Airport	EI308853 Corp	BBB/Baa2/BBB	6/07/2015	3.42	6.3024
Santos	EF102609 Corp	BBB+/-/-	23/09/2015	3.64	6.1792
GAIF	EI675822 Corp	BBB/-/-	19/05/2016	4.29	7.3975
Mirvac	EI414696 Corp	BBB/-/-	16/09/2016	4.62	7.1006
New Terminal	EF641357 Corp	BBB/Baa2/BBB	20/09/2016	4.63	7.1410
Dexus	EI223256 Corp	BBB+/Baa1/BBB+	21/04/2017	5.22	6.6589
Sydney Airport	EI684902 Corp	BBB/Baa2/BBB	6/07/2018	6.42	7.0808
Caltex Aust Fin	EI883417 Corp	BBB+/-/-	23/11/2018	6.81	6.5912
Brisbane Airport	EI620440 Corp	BBB/Baa2/BBB	9/07/2019	7.43	6.6330
APT Pipelines	EI325336 Corp	BBB/Baa2/BBB	22/07/2020	8.47	7.0454

Source: Bloomberg

As shown in the table above, all of the observed bonds have less than ten years to maturity, and only two of the observed bonds are longer than seven years to maturity. In addition, the IPART bond sample illustrates that the cost of debt is higher for bonds with a longer tenor to maturity. Specifically,

- The three year difference between the maturity of the Sydney airport bonds results in a 77.8 basis point price differential; and
- The 1.5 year difference between the maturity of the Mirvac bonds results in a 58.5 basis point differential.

Table 4 – Summary of IPART bond sample for Retail

Security	Ticker	Credit rating (S&P/Moody's/Fitch)	Maturity	Observation for 20 days to 19 Mar 12 years to maturity	average yield(%)
Bloomberg 7 year BBB fair value curve	C3567Y index	n/a	n/a	n/a	7.4342
Mirvac	EI195249 Corp	BBB	15/03/2015	2.99	6.9935
Sydney Airport	EI308853 Corp	BBB/Baa2/BBB	6/07/2015	3.30	6.6691
Santos	EF102609 Corp	BBB+/-/-	23/09/2015	3.52	6.6064
GAIF	EI675822 Corp	BBB/-/-	19/05/2016	4.17	7.7989
Mirvac	EI414696 Corp	BBB/-/-	16/09/2016	4.50	7.3402
New Terminal	EF641357 Corp	BBB/Baa2/BBB	20/09/2016	4.51	7.4040
Dexus	EI223256 Corp	BBB+/Baa1/BBB+	21/04/2017	5.09	6.9679
Sydney Airport	EI684902 Corp	BBB/Baa2/BBB	6/07/2018	6.30	7.2414
Caltex Aust Fin	EI883417 Corp	BBB+/-/-	23/11/2018	6.68	6.7430
Brisbane Airport	EI620440 Corp	BBB/Baa2/BBB	9/07/2019	7.31	6.9433
APT Pipelines	EI325336 Corp	BBB/Baa2/BBB	22/07/2020	8.35	7.2951

Source: Bloomberg

It is notable that Lease plan is not included in Retail sample as its maturity is within 2 years as at the observation date to 19 March 2012.

As shown in the table above, consistent with the Generation bond sample, all of the observed bonds have less than ten years to maturity, and only one of the observed bonds are longer than seven years to maturity. In addition, the IPART bond sample illustrates that the cost of debt is higher for bonds with a longer tenor. Specifically,

- The three year difference between the maturity of the Sydney airport bonds results in a 57.2 basis point price differential; and
- The 1.5 year difference between the maturity of the Mirvac bonds results in a 34.7 basis point differential.

The implication of the spreads identified for the same issuers with different maturies is that for each year of additional tenor a further 20 bps to 25 bps of return is required by investors. We have cross checked this implication using the Bloomberg fair value curves for varying tenors below.

In our view, IPART should apply the Bloomberg 7 year BBB fair value curve, with an adjustment factor to reflect a ten year tenor and its estimate of borrowing costs of 12.5 bps as referred to above.

7 year BBB corporate bond yields

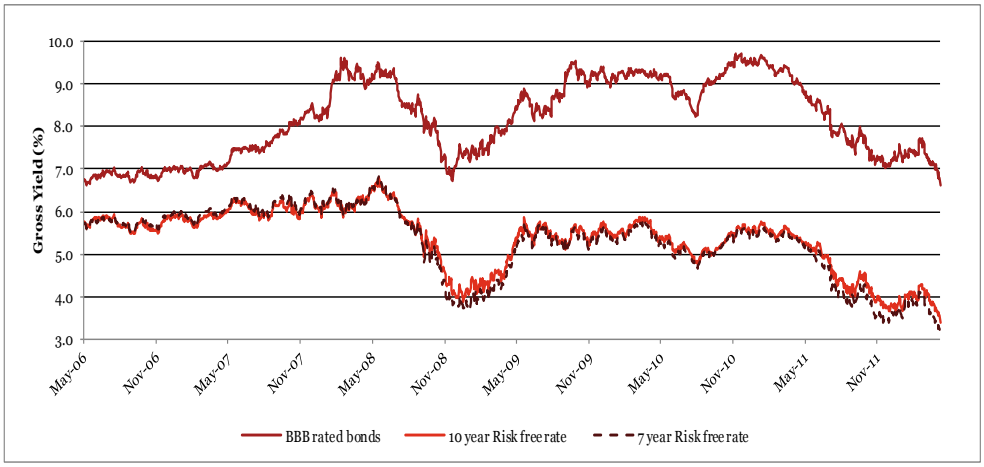
We observed the 7 year BBB corporate bond yields as at 7 May 2012 to be as follows:

- Spot rate of 6.61%;
- 30 day average of 7.03%;
- 90 day average of 7.29%;
- 180 average of 7.52%; and
- 1 year average of 7.72%.

We note that the nominal pre-tax cost of debt in the IPART draft report is in the range of 6.2% to 7.8% for Generation and 6.6% to 8.0% for Retail.

Figure 6 sets out the yield for 7 year BBB Australian corporate bonds as well as the ten and seven year Government Bonds rate over the period May 2006 to May 2012.

Figure 6 – 7 year BBB bond yields compared to 7 year and 10 year Government Bond rates

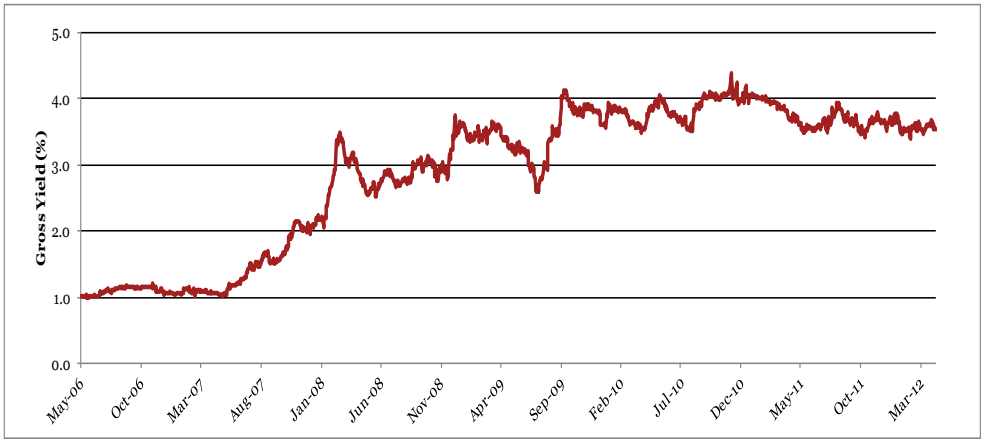


Source: Capital IQ

As shown above, the relative movements in all the rates shown above share some degree of correlation. From the period of December 2010 to April 2012 we note that there has been a steady decline in all rates shown above.

Figure 7 below depicts the spread of the seven year BBB Australian corporate bonds over the seven year Government Bonds rate over the period from May 2006 to May 2012.

Figure 7 – Spread of 7 year BBB bond yields over 7 year Government Bond rates

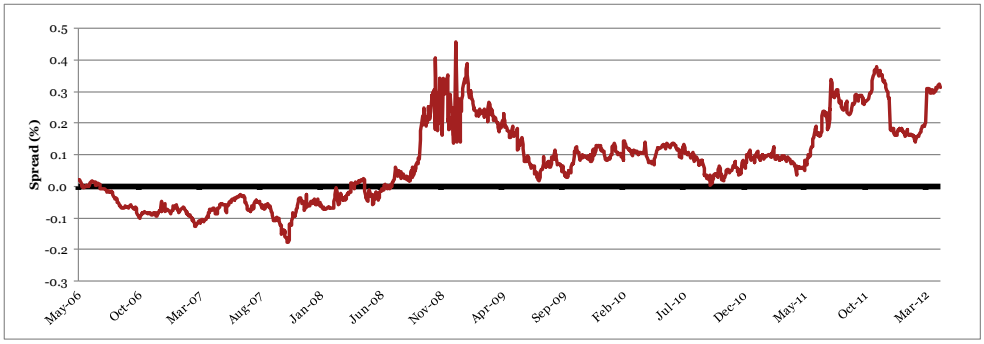


Source: Capital IQ

As shown above, for the period of April 09 to April 2012 the spread over the 7 year Rf rate has remained relatively consistent. The average spread over this 3 year period is 3.69% and this compares to the spot spread as at 7 May 2012 of 3.53%.

Figure 8 below depicts the spread between the 10 year and seven year Government Bonds rate over the period from May 2006 to May 2012.

Figure 8 – Spread between 10 year and 7 year Government Bond rates



Source: Capital IQ

As shown above, the spread between the 10 year and 7 year Government Bonds has shown some variability. Specifically, the negative values for the spread between May 2006 and March 2008 indicate that the yield curve was inverted. From the period of November 2008 to April 2012 the spread has varied and reached a high of approximately 46 bps in January 2009. The spread has been approximately 30 bps since April 2012. We would expect the additional maturity spread on BBB corporate bonds to be higher than than the spread on Government Bonds.

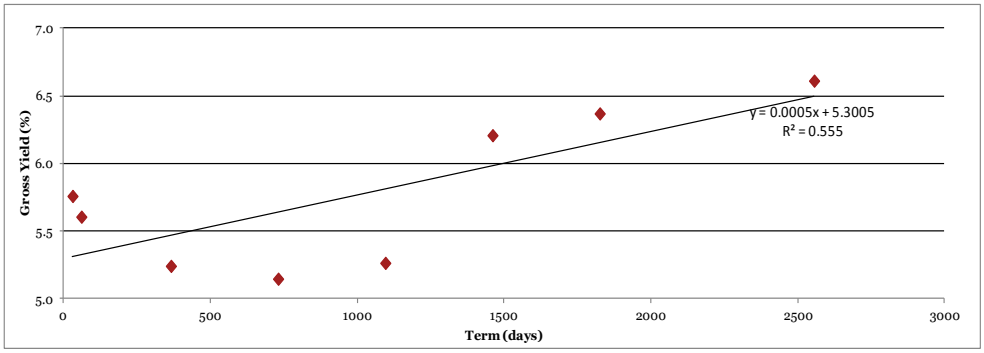
Cross checking the additional spread for tenor

We note that IPART's calculation utilise a 10 year Australian Rf rate and a debt margin that is based on reference to 7 year BBB corporate bonds. We note that this methodology introduces some inconsistency between the maturity of these rates. As a result we have undertaken an analysis of the yield curve for Australian 7 year BBB corporate bonds for the following tenors:

- 30 days (3 months);
- 60 days (6 months);
- 365 days (1 year);
- 730 days (2 year) ;
- 1095 days (3 year);
- 1460 days (4 year);
- 1825 days (5 year); and
- 2555 days (7 year).

Figure 9 below shows the profile of the yield curve as at 7 May 2012 for the tenors stated above.

Figure 9 – Yield curve of 7 year BBB corporate bonds



Source: Capital IQ

We acknowledge that using tenors of less than a year for the purpose of the above analysis may be somewhat distorting due to the influence of monetary policy on the yields of bonds with short terms to maturity. Nevertheless, given the limited data points, we have used all tenors as an illustration of the fact that the risk premium rises with term.

We have derived an estimate of the spread for a 10 year BBB corporate bond by utilising the linear equation implied by the trendline shown above. This is done as a result of no observable market data for the 10 year BBB corporate bonds. The linear equation implied by the trendline above is y = 0.0005x + 5.3005. Using the slope of the regression line, we have estimated an additional spread of 55 bps for 10 year BBB corporate bonds relative to 7 year BBBcorporate bonds.

It should be noted that the above derivation is an approximation that is derived using a limited number of data points and that should a more in depth analysis be performed the estimates may change. However, this is consistent with the additional spread required for 'paired' bonds issued by Sydney Airtport and Mirvac shown in Tables 3 and 4 above.

Conclusion

On the basis of the above, using the Bloomberg 7 year BBB fair value plus an additional premium for term in the range of 15 to 25 bps per annum, would result in a debt margin (applicable to a Rf based on 10 year Government Bond rates) of at least 400 bps.

5 Gamma factor

5.1.1 IPART's Gamma factor

The IPART draft report adopts a gamma factor in the range of 0.5-0.3, denoting that the applied range is the same range as used previously.

IPART March 2012 Review of Gamma Imputation Credits (gamma)

In March 2012, IPART issued their final decision in the report *'Review of imputation credits (gamma) – Research - Final decision'* (the IPART Gamma Report), which was written with the purpose to *"explain our final decisions on the value of imputation credits, or gamma, that we will use for future price determinations."* In the IPART Gamma Report, IPART concludes on applying a gamma of 0.25 for future price determinations. This is significantly lower than the current range of 0.5 to 0.3 as adopted in the IPART Draft Report.

IPART supports the lower gamma conclusion based on the following:

"Stability of WACC and prices over time

We currently use a gamma range of 0.5 to 0.3, with a mid-point of 0.4. The change in gamma has an impact on notional revenue, but the impact is small. This will be explained in detail in Section 4.5. We judge that the evidence for a lower gamma is sufficient to justify this change.

Consistency with the approach taken by other regulators and associated tribunals

The AER has adopted a gamma value of 0.25 based on the ACT's 2010/11 decision.[8] The ERAWA also changed its gamma to 0.25 for the 2011 Dampier to Bunbury Natural Gas Pipeline access arrangement.

Consistency with academic studies

Academic and independent expert studies have produced a wide range of estimates of the gamma. The SFG study is a significant addition to these studies and adds weight to the evidence for a lower gamma.

Consistency with commercial practice

Most commercial valuations use a classical tax system with a gamma value of 0. For those that use an imputation tax system, we confirmed that, after the ACT decision, some practitioners use a gamma value to 0.25"

IPART concludes the following in the IPART Gamma Report:

"Having regard to the available evidence, our final decision is to use a gamma value of 0.25 in our future price determinations."

We note that a number of academic studies have been prepared on the value of imputation credits (or gamma), and that the ranges in the studies vary. However, considering the exstensive research recently prepared by IPART concluding that a gamma of 0.25 is appropriate for future price determinations in March 2012, we

[8] Australian Competition Tribunal - Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9 (12 May 2011)

find it unusual that IPART would use any other gamma estimate to calculate electricity prices in the IPART Draft Report.

Conclusion

On the basis of IPART's final decision of a gamma factor of 0.25 as set out in the IPART Gamma Report, the gamma factor adopted in the IPART Draft Report should be lowered to 0.25. We note that such decrease in gamma will increase the pre-tax WACC, and thereby increase the notional revenues required to reach the required return on capital.

pwc.com.au