20 December 2012

Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

By email: ipart@ipart.nsw.gov.au

Dear Sir/Madam,

REVIEW OF REGULATED RETAIL TARIFFS AND CHARGES FOR ELECTRICITY 2013-2016

Origin welcomes the opportunity to respond to IPART's Electricity Issues Paper of November 2012. Origin is a Standard Retailer of electricity and gas in NSW, as well as a major participant in retail and wholesale energy markets across Australia.

The current determination (2010) has introduced a significant degree of confidence and stability in the NSW retail markets and a solid foundation to support full retail price deregulation. Origin supports a measured move to price deregulation during the 2013-16 period, with the 'opt-in' model providing a mechanism to help deliver the outcome of deregulation; an outcome that will result in increased competition and innovation from retailers.

Critical to the success of this review is setting the energy purchase cost allowance. Standard Retailers manage energy purchase costs using a combination of market instruments including longer term PPAs, physical generation assets and shorter term hedges. The market price of longer term hedging arrangements, such as PPAs and physical generation assets, reflect the Long Run Marginal Cost (LRMC) of generation.

Origin has addressed the questions raised in IPART's Issues Paper in the attached submission and look forward to further contributing to the current review. If you have any queries, please contact Keith Robertson on (02) 9503 5674.

Regards

Anthony Lucas
General Manager – Energy Risk Management

Executive Summary

Origin welcomes the opportunity to respond to IPART's Electricity Issues Paper of November 2012. Origin is a Standard Retailer of electricity and gas in NSW, as well as a major participant in retail and wholesale energy markets across Australia.

The current determination (2010) has introduced a significant degree of confidence and stability in the NSW retail markets and a solid foundation to support full retail price deregulation. At the same time a significant degree of change has occurred across the market including privatisation of the NSW Standard Retailers, introduction of the Clean Energy Future legislation, termination of the GGA Scheme, expiry of the Electricity Tariff Equalisation Fund and introduction of the Small-scale Renewable Energy Scheme. The form of regulation including the LRMC floor price has accommodated these significant changes of the past 3 years and underpinned the observed level of confidence in the NSW retail market.

With both Victoria and South Australia fully deregulating energy prices, and New South Wales now joining Queensland in deregulating prices for large customers using more than 100 MWh of energy per annum, this demonstrates momentum for all state governments to move to full price deregulation. Origin supports a move to price deregulation during the 2013-16 period, with the 'opt-in' model providing a mechanism to help deliver the outcome of deregulation; an outcome that will result in increased competition and innovation from retailers.

Critical to the success of the retail pricing methodology to be used in this review is that it fairly reflects the costs of an efficient Standard Retailer and builds on the foundation of current market confidence for a transition to deregulation of the retail market. With components such as Network being "pass-through", the most important element of this methodology is setting the energy purchase cost allowance.

The terms of reference for the 2013-16 determination require IPART to incorporate an element of market-based cost in establishing a floor price for the energy purchase cost allowance. While the structure of the National Electricity Market (NEM) leads to volatile and at times unpredictable wholesale prices, the risk management practices of Standard Retailers provide a much greater level of cost certainty. Standard Retailers manage this wholesale risk using a combination of longer term PPAs, physical generation assets and shorter term hedging instruments. The market price of longer term hedging arrangements, such as PPAs and physical generation assets, tends to reflect the Long Run Marginal Cost (LRMC) of generation. While details of these arrangements are often confidential, their prices can be readily benchmarked with an LRMC-style price assessment using publicly available data for transparency.

The market price of Futures contracts is much more volatile than the price of longer term hedges. Long term hedge prices "look through" the noise of these short term cycles yielding the underlying energy purchase cost.

Origin is broadly supportive of the proposed methodology and makes the following key points in relation to IPART's proposed approach:

- Origin supports an opt-in approach as providing a useful transitionary measure to full price deregulation. However implementation must be contingent upon a Government commitment to de-regulate prices during the 2013-16 determination period.

- The market based cost assessment of Wholesale Energy Costs should take account of Standard Retailers' hedging approach recognising the material contribution of long term PPAs and ownership of generation.

- Origin supports Frontier making its own assessment of generation modelling input costs. Origin has outlined its views of key cost inputs and would welcome further discussion of input assumptions.

- The Wholesale Energy Cost allowance should include a volatility premium to recognise residual risks.

- Recognition of regulatory risks is critical. Origin supports retention of the current cost pass through mechanism, particularly its application in relation to SRES costs within and across determination periods.

- It is appropriate that the retail margin only provides recovery of systematic risks, as proposed by IPART, provided that other cost allowances and mechanisms are able to cover all specific risks.

- The inclusion of a headroom allowance is consistent with the objective of promoting competition and represents a reasonable trade-off between the long term interests of customers, interests of retailers seeking to enter the market and the short term interests of consumers that choose not to take up alternative market offers.

Background

The Minister for Energy in the New South Wales Government has directed the Independent Pricing and Regulatory Tribunal (IPART) under section 43A of the *Electricity Supply Act 1995* to investigate and report on the regulated retail tariffs and retail charges to apply to small retail customers between 1 July 2013 and 30 June 2016.

The Minister has highlighted in the Terms of Reference that customers are increasingly moving away from regulated tariffs, with currently just over half of small retail customers remaining on regulated prices in NSW. To assist the transition to an effective competitive market, the definition of a *small retail customer* for the purposes of price regulation will be reduced from customers using less than 160 MWh of electricity per year to customers using less than 100 MWh of electricity per year.

As a first step in response to the Minister's directions, IPART released an *Issues Paper: Review of regulated retail tariffs and charges for electricity 2013-2016* (Issues Paper) on 14 November 2012 which highlights its proposed approach to the review and invites stakeholders to comment.

At the same time, IPART also released:

- Draft Methodology Paper – Weighted Average Cost of Capital
- Draft Methodology Paper – Frontier Economics
- Draft Methodology Paper – SFG
- Media Release
- Fact Sheet
- R Model Spreadsheet
- Information request spreadsheet

On 3 December 2012, IPART conducted a public forum in which Standard Retailers presented their price proposal for the 2013-2016 price path.

Origin understands that following consultation on the Issues Paper, IPART will:

- Release a Draft Determination during March-April 2013
- Hold a public hearing in April 2013
- Release a Final Determination in May 2013

The body of this submission addresses each of the key issues that IPART has raised in its Issues Paper. The attachments to this submission address the more detailed issues raised in IPART's supporting methodology papers. Origin is broadly supportive of the margin estimation methodologies proposed by SG Consulting noting these have not changed since the previous determination. Origin has therefore commented on this paper within the body of this document.

Assessment Criteria

1. Is IPART's proposed approach for assessing retail market competition appropriate for this review?

At the outset, it should be noted that the NSW retail electricity market is already a competitive market. This is evident in terms of the market structure and competitive dynamic between retailers and customers, as evidenced by the prices and range of products that are currently offered to NSW customers.

Market Structure

Tariffs under the current determination are set at a level that allows for competition. As a result there is evidence of strong independent rivalry within the market; active competitors include AGL, TRUenergy (EnergyAustralia), APG, Red Energy, Lumo and Dodo.

New entrant retailers have been able to readily secure the core capabilities to develop their business. This is because there are multiple competing wholesale suppliers offering a range of hedging instruments. There are also numerous customer service and sales channel providers active in the market, in addition to the in-house options available to new entrants. Interest from new entrants remains high with electricity licenses recently granted to Qenergy, GoEnergy, Progressive Green, and applications from Click Energy and Powershop Australia currently under consideration by IPART.

There has also been significant growth in intermediaries including one big switch, goswitch, youcompare, makeitcheaper.com.au, energywatch.com.au. Information on offers is readily available to customers, for example IPART's comparison site: www.myenergyoffers.nsw.gov.au

Conduct

In terms of competitive activity, advertising campaigns with competitive market offers are widespread in both metropolitan and country areas. Churn levels in the NSW retail market are currently around 20% annualised reflecting a significant increase in customer churn post privatization of the NSW retailers. This level is approaching that of Victoria; a retail market recognised as one most competitive in the world.

This level of churn is also high relative to churn rates in other industries. AGL recently collated churn rates across industries citing switching rates around 12% for insurance, 4% for health services and 8% for banking. The mobile phone market is often cited as highly competitive with customer switching driven by the rapid development of new technologies and services. Macquarie University's

recent "State of the Mobile Nation" report estimated annual churn for mobile phones at around 16%pa[1]. By comparison a switching rate of circa 20% pa for electricity in NSW is evidence of effective competition. This shows that the current regulatory period (including the LRMC floor) has delivered competition and outcomes for consumers.

Products and Pricing

Retailers offer a range of pricing structures and levels. Much of the current competition is price focused with many offers based on a discount against a headline tariff. Most NSW market contracts are priced by reference to tariffs regulated by IPART, with a discount being applied to this rate. Over recent history there have however been a range of differentiated retail products, including: price discounts, loyalty rewards, value added offerings, green products, differing contract terms, fixed rates and incentives for payment options. Retailers have also developed and promoted specific payment solution products, for example Origin's product Easipay (which provides for fortnightly or monthly billing).

IPART's Approach

Origin considers IPART's approach for assessing retail market competition to be appropriate. However, there are important factors that Origin believes IPART should take account of in its assessment. In comparing NSW to other NEM regions, IPART should take account of the impact in NSW of historic regulated pricing decisions and the impact of the Electricity Tariff Equalisation Fund (ETEF) scheme on NSW retail market competition in previous years. Cumulative customer transfers would otherwise be much higher had regulated prices consistently provided a reasonable retail margin, as has been the case under the current determination, and had the Standard Retailers not been shielded from wholesale market volatility by the ETEF scheme. In the absence of ETEF and provided that reasonable retail margins are maintained for the 2013-16 determination period, retail market competition can be expected to continue to increase, as is already occurring and evidenced by published transfer data coupled with defensive or "save" campaigns that reflect competition between market participants.

[1] David Gray, Steven D'Alessandro and Leanne Carter, *State of the Mobile Nation: Switching Attitudes and Behaviours of Mobile Phone Service Providers in Australia*, Final Report, Macquarie University Department of Marketing and Management, March 2012, page 7

2. What can be done to facilitate retail market competition in NSW over the 2013 determination period?

Origin notes that the pursuit of competitive retail markets is an objective of the Australian Energy Market Agreement, which was signed by all jurisdictional energy ministers in 2006, and which also carries with it a commitment to implement retail price deregulation once a competitive market has been established.

Origin believes that the NSW market is a market where competition is currently effective. The key factor that will affect retail competition is the confidence of current and prospective suppliers in regulated pricing outcomes and importantly the path to deregulating retail pricing. A sensible 2013-16 regulatory determination, including a path to deregulation will increase the level of competition exhibited in the NSW market. While Origin supports an annual review of wholesale energy costs, it is important to maximise certainty for stakeholders by ensuring that the framework for this review is consistent and transparent throughout the period of the determination.

Origin also encourages IPART to continue to complete its assessment of competition and to provide its recommendations to NSW Government. In turn the NSW Government should progress its policy deliberations such that it is able to make timely decisions on receipt of the AEMC's review of the effectiveness of retail competition in NSW in 2013. A committed path to deregulated pricing coupled with pricing outcomes that support competition will have the greatest positive impact on the development of competition in the 2013-16 determination period, and will be likely to bring forward retailer investment and to promote market development (such as a market led deployment of smart meters).

3. Is an opt-in model for all or part of this determination preferable to regulating all existing regulated prices? If we continue to regulate all existing regulated prices, how could we facilitate competition by reducing the large number of regulated prices for Country Energy?

An opt-in model has the potential to assist in the transition of customers from regulated to market contracts. However, this must be regarded as a transitionary measure and tied to the removal of price regulation.

Origin is concerned that if an opt-in approach is adopted without a commitment to de-regulate prices it may serve to entrench price regulation. Both IPART and the NSW Government have a role to play in using the 2013-16 determination period, and the implementation of an opt-in facility, as the basis to deliver retail price deregulation by the end of this period.

Origin also recognises that customer communication is critical ahead of delivering an opt-in model. Given the timing of the final IPART determination, it

is likely that there may not be enough time to implement an opt-in model by 1 July 2013.

It should also be noted that an opt-in model will need to be developed to minimise operational costs and recognise retailer's process and systems limitations to ensure implementation costs do not outweigh the likely benefits.

With these issues in mind Origin proposes that the 2013 determination provides for an opt-in model to be implemented from 1 July 2014 if the Government provides a commitment before July 2014 to cease regulating retail pricing by the end of the 2013-2016 price determination period. This timing would allow the Government time to assess IPART's report and the AEMC report on the effectiveness of competition (due September 2013) and determine its policy for price deregulation in late 2013.

Origin considers the following to be a viable opt-in model, contingent upon a Government announcement in 2013 to cease regulating pricing at or before the end of the 2013 determination:

- IPART's 2013-16 determination allows for an opt-in model to apply from 1 July 2014, if NSW Government commits to deregulate prices.
- Retailer and Government communications are delivered, post Government commitment.
- Customers currently on standard form customer supply contracts are transitioned to a default contract that is effective from 1 July 2014.
- Transitioned customers' tariffs and miscellaneous fees are, upon transition, equivalent to standard form contract rates.
- Transitioned customers' new terms and conditions are, default contracts consistent with NECF requirements.
- Transitioned customers are provided with clear information regarding their new default contract and their ability to choose an alternative market contract.
- Market customers can, during the defined period, move to the default contract.

Origin notes that the timing of IPART's Final Determination and the need for customer communications will affect the timing of any proposed opt-in model.

Origin is in the process of rationalising the obsolete Country Energy tariffs; these tariffs are not cost reflective. IPART states in its proposal that obsolete Country Energy tariffs are a barrier to competition and that rationalisation of these would be one benefit of the opt-in model. Origin notes that a number of customers in the Country Energy area whose tariffs are not cost reflective may not wish to exercise their opt-in right as this could mean an increase in tariff. These customers will however continue to benefit from an under recovering tariff under the default contract until the cross subsidy is unwound.

In summary, Origin supports the development of an opt-in model but recognises the challenges in developing an effective model and implementation plan. The viability of such a model would depend on the successful resolution of these issues and balancing additional burdens against anticipated benefits. Origin looks forward to assisting IPART with issues associated with an opt-in model.

4. Are our previous decisions, such as not to regulate green premiums and to restrict the introduction of new regulated prices, still appropriate?

To date, green premiums have been successfully developed and promoted by market participants. Origin cannot see that there will be any benefit in green premium regulation. Origin accepts the current framework and limitation on introducing new regulated tariffs and considers that it is a reasonable approach.

5. Are there enhancements that can be made to our current Weighted Average Price Cap (WAPC) approach?

Origin supports the WAPC approach in its current form and does not recommend any specific enhancements. This approach has worked well in previous electricity determinations and under the gas Voluntary Transitional Pricing Arrangements that apply to gas. The use of a WAPC without side constraints on tariffs will allow retailers to rebalance tariffs in a measured manner and to unwind any remaining cross subsidies.

IPART noted that other jurisdictions have applied an indexation approach to adjust prices beyond the first year of a determination period. IPART should avoid an index approach which would be difficult to implement and would result in significant administrative burden. An index approach may also result in the perverse outcome of limiting competition; regulated prices would fall as competitive offers improve, and this would reduce the incentives of customers to churn from standard contracts to market contracts. The current annual review of wholesale energy costs is a more robust approach.

6. Is additional pricing protection required for Country Energy customers? If so, how can this be achieved without limiting Country Energy's ability to rationalise its regulated prices?

IPART notes in its paper that obsolete Country Energy tariffs pose a barrier to competition. Obsolete tariffs for Country Energy are not impeding competition. Origin has not observed any evidence of lower churn in those areas where the concentration of obsolete tariffs is higher.

It is important, in the interest of achieving a fully competitive deregulated retail market that these Country Energy customers (approximately 10% of all Country Energy customers) be gradually transitioned to cost reflective prices.

Origin has a strong incentive to rationalise Country Energy tariffs to deliver operational efficiencies and ensure cost reflective pricing, however this must be balanced against immediate customer interests. Origin has the right commercial incentives to make decisions that reflect this trade-off.

7. Are any enhancements needed to the current cost pass-through mechanism for the 2013 determination?

IPART's current determination recognises the risks that retailers face in dealing with unforeseen regulatory or taxation changes. Under these circumstances the determination allows Standard Retailers to pass through the incremental, efficient costs associated with a defined regulatory or taxation change events subject to a materiality threshold.

This is an important mechanism that both supports the viability of retailers during periods of regulatory change and avoids the imposition of risk premiums that would be otherwise required to compensate for this risk.

On the 19th October 2012 the Clean Energy Regulator (CER) issued an update to the non-binding estimate of the Small-scale Technology. As Origin has previously advised, when the binding estimate is published Origin intends to seek IPART's agreement to include recovery of the incremental costs associated with this expected change in the STP under the new determination.

8. Is the stand-alone approach for estimating the LRMC of generation the most appropriate approach for the 2013 determination?

LRMC

Origin notes that the terms of reference require IPART to calculate the weighted average of the LRMC (75%) and market-based costs (25%) of purchasing wholesale electricity to form a floor price for the electricity purchase cost allowance.

The allowance for wholesale electricity costs is the key component of the regulated retail tariff and so is critical to ensuring cost reflective retail tariffs overall.

In assessing wholesale electricity costs Origin encourages IPART to take account of the LRMC of generation. Applying an LRMC methodology has been effective in the current determination ensuring:

- regulated retail tariffs are cost reflective;
- retail competition increases; and
- the conditions for a transition to a fully deregulated market are delivered.

A greater recognition of the LRMC as the method for estimating the cost of energy is likely to avoid consumers being exposed to large swings in price in the future and will therefore lead to more sustainable electricity prices over time.

Stand Alone Approach

Frontier has advised IPART to adopt the stand-alone approach to estimating the LRMC, this is consistent with its advice for the 2007 and 2010 determinations. The stand-alone approach allows the estimate of LRMC to reflect the capital cost of new generation plant.

As Frontier notes, given that the likely investment over a short timeframe would have already been committed, and so treated as a sunk cost, an incremental LRMC estimate may in the short term consistently fail to reflect the capital costs of generation plant required to serve load. Using an incremental approach to inform retail prices may therefore jeopardise the financial viability of retailers.

Origin therefore supports Frontiers conclusion that the stand-alone LRMC methodology is the most appropriate approach for the 2013 determination.

9. How should IPART make best use of publicly available market forward price data and modelled forward price data in estimating the market-based energy purchase cost?

Long term supply arrangements

Origin recognises that IPART is required to calculate a market-based energy purchase cost and to this end proposes constructing a "model" contract portfolio for a standard retailer.

It is proposed that this is done by describing the portfolio in terms of standard futures products (base and peak contracts) that can then be priced with reference to futures prices. However this is not a good representation of a Standard Retailer's portfolio. While market liquidity in the NSW futures market is reasonable in the near term, it should be recognised that if standard retailers were to attempt to hedge their entire NSW regulated retail load using short term Futures, the volume required would be such as to significantly increase Futures prices from those observed today.

While the structure of the National Electricity Market (NEM) leads to volatile and at times unpredictable wholesale prices, the risk management practices of Standard Retailers provide a much greater level of cost certainty. Standard Retailers manage this wholesale risk using a combination of longer term PPAs, physical generation assets and shorter term hedging instruments. The market price of longer term hedging arrangements, such as PPAs and physical generation assets, tends to reflect the Long Run Marginal Cost (LRMC) of generation. While details of these arrangements are often confidential, their prices can be readily benchmarked with an LRMC-style price assessment using publicly available data for transparency.

The market price of Futures contracts is much more volatile over time than that of longer term hedges. Long term hedge prices "look through" the noise of these short term cycles yielding the underlying energy purchase cost.

Carbon discounting

As the current carbon pricing mechanism lacks bipartisan support, there is considerable risk that upon a change in Government, the *Clean Energy Act* (CEA) will be repealed.

Futures contracts are carbon inclusive contracts, which is to say that the strike price of futures contracts will not be adjusted in the event of a repeal of the CEA. As a result futures contracts are trading at a discount in outer years, reflecting participants' view of the probability of repeal of the CEA.

It will therefore be necessary for IPART to make adjustments to account for the carbon discount that is currently implied into electricity Futures to account for carbon policy uncertainty. A comparison between the price for comparable over the counter contracts that contain the AFMA carbon clause and the equivalent futures contract will be required to adjust futures prices for this discount.

10. Is a 'point in time' or a 'rolling average' approach to assessing forward prices preferable for estimating the market-based energy purchase costs?

A point in time approach that is based on a single trading day is problematic as the results can vary significantly depending on the day selected. Origin considers that a rolling average is a better approach to estimating market-based energy purchase costs for this element.

There is a distinct risk that the prices in the market at a point in time are not representative of actual purchase costs for the type and size of load of a Standard Retailer. The allowed prices will not therefore provide compensation to retailers for acting efficiently and prudently by purchasing forward contracts over a period of time.

The mark-to-market concept is a requirement for financial reporting of the value of the business or its assets, but it is not a reflection of the costs of the assets. The efficient retailer's book of contracts for the purposes of setting prices must reflect reasonable costs of acquiring that book over time, and in accordance with prudent commercial practices and risk limits.

11. Is including a volatility allowance within the market-based purchase cost an efficient and reasonable means of addressing the risk of wholesale electricity price volatility?

A volatility allowance is important when calculating the market-based purchase costs in order to compensate retailers for the additional cost associated the volatile nature of wholesale electricity prices in the NEM. As a consequence of this volatility, retailers must retain additional working capital to cover residual risks.

Frontier has previously modelled a volatility allowance for IPART based on the standard deviation of the conservative point of each retailer's efficient frontier. Origin considers that a similar approach is appropriate for the 2013-16 determination.

12. Is our proposed approach for incorporating the carbon price appropriate for the 2013 determination? How should we account for uncertainty about the prices after the end of the fixed price period?

The Commonwealth Government's carbon pricing mechanism commenced on 1 July 2012 imposing additional costs and risk on retailers and was reflected in changes made to retail prices from 1 July 2012.

The scheme was originally designed with a fixed carbon price to apply in the first three years of the scheme, followed by a floating price that was subject to a floor from 1 July 2015. A further set of amendments to this legislation were made in September 2012 which have the effect of removing the proposed floor price for the scheme between 2015-16 and 2017-18. These changes were made in the context of linking the Australian scheme to the European Emissions Trading Scheme.

While current European Carbon Unit prices would suggest a low carbon price for Australia in FY16, there is considerable regulatory uncertainty around carbon price forecasts. The risk that European legislation will be changed to address the current Carbon Unit oversupply position, which would place upward pressure on Australian carbon prices, is considerable. This is not a risk that retailers can efficiently manage at present.

Given the large degree of uncertainty attached to policy and regulatory arrangements, particularly overseas, there is significant difficulty attached to forecasting carbon costs beyond 1 July 2015. An improved view of market prices beyond 1 July 2015 is expected to be available when auctions administered by the Clean Energy Regulator commence in 2014.

Origin proposes that, rather than apply a substantial risk premium to carbon cost estimates for FY16, that the annual review of wholesale energy costs accommodates any change in the likely carbon price for FY16. Alternatively if there is still material regulatory uncertainty at the point of estimating the allowance for the wholesale electricity cost for FY16, any incremental carbon costs should be addressed through the cost pass through mechanism.

13. Is our proposed approach for managing the risk that the Carbon Pricing Mechanism is removed or changed over the 2013 determination period appropriate?

Given that the Carbon Pricing Mechanism was implemented without bipartisan support and has become a major policy issue in the lead up to the next federal election, the risk of the Carbon Pricing Mechanism being removed or changed during the 2013-16 determination period is considerable.

Origin considers that IPART's proposed approach of making an adjustment to the energy purchase cost allowance, either during the annual review process by way of a cost pass-through mechanism (depending on when changes to the Carbon Pricing Mechanism are made) is appropriate.

As noted in Origin's response to Issue 9, where futures prices are used to estimate a carbon inclusive energy cost these must be adjusted to recognise the discount that the market currently applies for policy uncertainty.

14. How should IPART decide whether it is in the long term interest of customers for the energy purchase cost allowance to include further headroom in excess of the price floor?

The terms of reference require that IPART has regard to the effect of regulated retail prices upon competition. Retail tariffs should therefore be set at a level that is sufficient to protect and promote competitive market offers. The inclusion of headroom is consistent with this objective and a headroom allowance represents a reasonable trade-off between the long term interests of customers, interests of retailers seeking to enter the market and the short term interests of consumers that choose not to take up alternative market offers.

Origin notes that IPART has proposed that the retail margin be assessed on the basis of systematic risk only with all specific risks that retailers will face being captured through other cost allowances and additional regulatory mechanisms (for example, volatility allowance, cost pass through mechanism for unforseen changes to regulatory and taxation obligations). However, the adequate capture of all specific risks will only be clear after stakeholders are able to assess the outputs of Frontier's modelling. This may therefore be an area that needs refinement after stakeholders have commented on the draft determination.

Standard Retailers are subject to a high level of regulatory risk that is unlikely to be captured in the retail margin as it is hard to find industry comparables with a similar risk. As observed in Origin's presentation to IPART's Public Forum on regulated electricity and gas prices, in the last twelve months alone retailers have had to respond to the introduction and subsequent amendment of the Clean Energy Act, the proposed and then deferred introduction of the National Energy Customer Framework, the start of the short term gas trading market in Brisbane, changes to most of the green schemes and the re-opening of an existing regulated pricing determination in another jurisdiction by way of example. While the cost pass through clause accommodates some of these risks, there are many other risks that fall outside its scope. Any shortfall in accounting for risk in the retail margin could be accommodated for in the headroom allowance.

In considering an appropriate level of headroom Origin proposes that IPART considers the level of discount against a regulated tariff a competing retailer may offer to attract customers and the full acquisition cost incurred.

The headroom allowance, like the retail margin should be expressed as a percentage margin on total costs.

15. How should we estimate the costs of purchasing certificates under the LRET, SRES and ESS in the 2013 determination?

In relation to the Large-scale Renewable Energy Target (LRET), Origin recommends that the quantity of purchasing certificates be estimated by reference to the Renewable Power Percentage (RPP) estimated by applying the CER's published targets.

Origin notes that Frontier proposes estimating LRET costs based upon a modelled and market based approach. Origin recommends that IPART apply the modelled approach to overcome difficulties associated with contract market liquidity. This estimate should incorporate the additional costs of peaking generation required to support the intermittent nature of wind generation. More detailed comments are provided in part 5 of attachment 1.

In relation to the Small-scale Renewable Energy Scheme (SRES), Origin recommends that the Clean Energy Regulator's recent estimate of the STP for Cal Years 13 and 14 be used and that the Clearing House price of $40 per STC be applied.

In relation to the Energy Savings Scheme (ESS), the certificate cost should be based upon the forward price curve.

16. What is the most appropriate way to manage the timing issues associated with the release of the Small-scale Technology Percentage?

As Origin has noted in its response to Issue 7 that the timing issues associated with the release of the small scale technology percentage (STP) can be best addressed by continuing application of the cost pass through mechanism set out in Schedule 4 of the current determination.

Origin considers that the SRES pass through should be reviewed annually to ensure that it is consistent with annual changes to the Small-scale Technology Percentage.

17. What is the appropriate scope of IPART's annual review of the energy cost allowance? In updating a decision in an annual review, should we use the same methodology we used for making the original decision?

The scope of IPART's annual review should be limited to the energy cost allowance as consistent with the 2010 determination this should include:

- the energy purchase cost allowance (including volatility allowance);
- the green scheme cost allowance; and
- the energy losses cost allowance.

It is particularly important that the LRET costs and energy costs are assessed together given their interdependence.

IPART should apply a consistent methodology for the original decision and the annual reviews.

18. Is our proposed characterisation of a Standard Retailer appropriate for the purposes of making the 2013 determination?

IPART has proposed that the Standard Retailer is:

- A standalone retailer in NSW that is not vertically integrated into electricity distribution in NSW.
- Serves retail customers, including small retail customers, in NSW and potentially other jurisdictions across the NEM, and in doing so has achieved economies of scale in retailing.
- Can offer retail customers standard form and/or market customer supply contracts.
- Has an existing customer base to defend and seeks to acquire new customers.

Origin considers that IPART's proposed characterisation of a Standard Retailer is appropriate.

19. Have there been any significant changes to retail operating costs and the costs of acquiring and retaining customers since the 2010 determination?

There are likely to be material differences between retail operating costs estimated before the 2010 determination and current estimates. These differences will reflect the different scope and size of the businesses and will be further complicated by differing cost allocation practices.

20. What factors explain the apparent differences in retail costs reported by publicly listed companies?

Assessing the differences between the published results of publicly listed companies would require further information from each business to normalise the results.

There are minor discrepancies between the retail costs summarised in cost to serve metrics reported by Origin and its actual retail operating costs. These discrepancies result from the application of accounting methodologies, in particular the allocation of significant items.

21. Has there been a change to the systematic risks facing electricity retailers and if so, how should they be compensated for?

Origin notes that IPART has proposed to set the retail margin allowance to account for retailers' systematic risk only, with all specific risks that retailers face being accounted for through the other cost allowances and additional regulatory mechanisms.

Origin reiterates concern expressed during IPART's previous electricity price setting process that a focus on systematic risk only, when assessing retail margin, will result in retail margins that are not commensurate with the regulatory risks and will further serve to discourage new retail market entrants and retail competition.

Recent material changes in regulation have significantly increased regulatory risk, and this is unlikely to abate, particularly with the implementation of the National Energy Consumer Framework (NECF) and other changes to the regulatory environment during the 2013-2016 period.

Origin proposes that this increased regulatory risk be accounted for in headroom or, in the absence of this, that retail margins be set to account for increased regulatory risk which is not accounted for elsewhere.

Origin therefore considers that IPART's proposed approach under which only systematic risks are accounted for in the retail margin is appropriate, but only provided that specific risks are adequately accounted for in other allowances and mechanisms.

22. Should the retail margin continue to be set as a fixed percentage of total costs and recalculated as part of the annual review process?

Origin reiterates the comments in its response to Issue 21 regarding the need to account for all specific risks that retailer face in other allowances and mechanisms or, in the absence of such, providing for residual risk in the retail margin. Origin otherwise supports the retail margin being set as a fixed percentage of total costs and recalculated as part of the annual review process.

23. What is the appropriate level for security deposits, late payment fees and dishonoured bank cheque fees?

While Origin doesn't current apply security deposits, it seeks to retain the right to do so.

In terms of late payment fees and dishonoured bank cheques fees, Origin seeks to align the fees for customers in the Integral Energy network with those of the customers in the Country Energy network.

Origin also seeks to move these fees closer to cost reflectivity.

24. Should IPART prescribe the circumstances under which retail charges should be applied, or should we rely on the NSW regulations or the National Energy Retail Rules (whichever applies in NSW)?

Origin supports the continued application of the current rules until the National Energy Retail Rules apply.

25. Is our proposed approach for assessing the impact of our determination on customer appropriate? Are there any other issues we should consider?

Origin supports the current scope of IPART's customer impact assessment.

This analysis provides useful context by expressing energy price changes in relation to wages and household disposable income, it is important that the impact of any changes on household budgets is explained relative to these benchmarks and other recognisable expenditure items, such as typical rental or mortgage payments, groceries costs, etc.

In addition, it is important for the assessment to recognise the context in which regulated tariffs operate, namely a competitive market in which market contracts are offered to customers at a discount to the standard contract. It may, for example, be useful for IPART to expressly state the discounts that may be available to customers if they elect to move to a market rate. This would provide a more complete picture of customer impact within the competitive NSW retail market.

Attachment 1. Methodology Report – Input Assumptions and Modelling

1. Introduction

IPART has engaged Frontier Economics (Frontier) to provide advice in relation to the Energy Purchase Cost Allowance and the cost of complying with the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). This entails advising IPART on input assumptions, regulated load profiles and wholesale energy costs.

Frontier has previously advised IPART on estimating wholesale energy costs for IPART's 2007 determination and IPART's 2010 determination. Frontier used a high-level modelling methodology in 2007 and 2010 and proposes to continue with the same approach for the 2013 determination.

Frontier has provided a Draft Methodology Report in order to provide an overview of its proposed approach and to explain its preliminary views on the approach to developing input assumptions and modelling wholesale energy costs.

Origin is well placed to comment on Frontier's draft methodology paper. As the NEM's largest operator of generation capacity, Origin has significant experience in contracting and sourcing coal and gas resources for our 5,310MW portfolio of dispatchable generation. Origin has experience in plant construction from generation projects at Darling Downs in Queensland (2010) and Mortlake in Victoria (2011). Origin also holds a significant investment in CSG with Australia's largest 2P CSG reserves and binding sales of 8.6Mtpa of LNG.

PART A – Modelling methodology

2. Overview of modelling methodology

2.1 Frontier Economics' energy market models

For the purposes of estimating wholesale energy costs, Frontier adopts a three-staged modelling approach which makes use of three inter-related electricity models: *WHIRLYGIG*, *SPARK* and *STRIKE*.
Origin is generally supportive of the approach to calculating energy purchase cost using the Frontier models. We have identified a number of issues we would like IPART to consider below.

3. Long run marginal cost modelling

3.1 LRMC of a single plant or a mix of plant?
3.2 Determining the LRMC of a mix of plant
3.3 Implementation of the stand-alone LRMC approach
3.4 Implementation of the incremental LRMC approach

Frontier has stated that, due to the risks and inefficiencies associated with selecting an efficient, single candidate to provide a reference price for NSW electricity, it recommends LRMC methodology using least cost mix of plants. Origin supports Frontier's approach to use a least cost mix of plants.

Frontier recommends estimating the LRMC of the regulated load using a stand-alone approach (with the effect of re-pricing all existing capacity at efficient levels) as was used in Frontier's advice to IPART in 2007 and 2010.

Origin considers that a stand-alone approach should be applied. The stand-alone model is more consistent with the Terms of Reference and avoids the necessity of allocating incremental plant to the regulated load. The use of the regulated load is required in order to be consistent with the calculation of the energy purchase costs which are based on this load.

Frontier has advised against estimating the LRMC of the regulated load using an incremental approach and Origin agrees that a stand-alone approach should be applied.

4. Market-based energy purchase costs

Estimating market prices is a complex exercise with potential for a wide variance in results driven by detailed assumptions. It is therefore important that there be a high level of transparency around this estimation process. Origin encourages IPART to provide a suitable level of detail to explain the calculations when the draft report is published.

4.1 Forecasting spot prices
4.2 Forecasting contract prices
4.3 Modelling market-based energy purchase costs

Frontier proposes to estimate market-based energy purchase costs by adopting a market-based approach to modelling spot prices. It considers that this will reflect the interactions between the physical and economic characteristics of the electricity market and the strategic incentives that market participants face.

Frontier proposes to base forecast contract prices on modelled or observed market prices. Its first approach was to forecast spot prices by applying a contract premium of 5% to the relevant spot prices modelled using SPARK.

Frontier's second approach was to base forecasts of contract prices on publicly available contract prices for the NEM. When using published contract prices, Frontier considers it appropriate to adopt a 'point-in-time' to determine the relevant prices of those contracts, as was adopted by IPART in 2007 and 2010.

Origin considers that this approach is reasonable and provides a level of sense checking of modelling results. As Origin has noted in response to Question 9, it

will be necessary for Frontier to make adjustments to Futures Prices to account for the carbon discount that is currently applied due to carbon policy uncertainty.

In developing a model contract portfolio Origin supports the proposed adoption of the conservative point on the efficient frontier. Origin notes that in the recent ESCOSA review (which applied a similar approach), Origin was unable to reconcile the published contract portfolio to this objective. It is critical that the model contract portfolio be a reasonable representation of the approach likely to be taken by an efficient standard retailer. The model portfolio needs to be sense checked to ensure it has an appropriate level of hedge cover particularly in critical peak periods.

Load volatility

Frontier proposes to account for load volatility by using, for each Standard Retailer, three forecast load shapes (10% POE, 50% POE and 90% POE), as representing a realistic range of load volatility outcomes.

As Frontier notes, even the conservative point on the efficient frontiers still leave an element of risk in the portfolio. Frontier considers that, consistent with it approach in advising IPART for the 2007 determination and the 2010 determination, it is appropriate to compensate retailers for this residual risk through a volatility allowance. The volatility allowance is distinct from any form of load or price volatility premium, which will be accounted for in the assumed load-price shapes input into *STRIKE*.

Origin considers that a volatility allowance is proposed to compensate retailers for residual risk which is present even at the most conservative point on the efficient frontier.

Origin agrees with the inclusion of a volatility allowance and considers that a model of a prudent retailer's hedge costs must both adopt a conservative position and apply a risk premium.

5. LRET and SRES

5.1 Costs of complying with the LRET

In its advice to IPART for the 2007 determination and the 2010 determination, Frontier estimated the cost of LGCs (then known as RECs) on the basis of the LRMC of meeting the scheme target. This was calculated as an output from Frontier's least-economic cost modelling of the power system, using an incremental LRMC approach.

Given that there are arguments in favour of using published prices for LGCs and using an LRMC approach to model the costs of the LGCs, Frontier intends to advise IPART on the costs of complying with the LRET using both of these approaches.

Origin considers that it is important that there be consistency between LRET modelling and wholesale energy cost modelling. This is particularly important to ensure that the costs associated with additional peaking capacity required in the NEM to support intermittent wind generation is captured in IPART's energy costs estimate. Origin understands that under Frontier's proposed approach this cost is to be included in the LRET cost estimate.

Origin notes that Frontier proposes estimating LRET costs based upon a modelled and market based approach. Origin recommends that IPART apply the modelled approach. LRET costs are driven by windfarm construction costs, with windfarms only attracting efficient financing when they contract for their offtake under a PPA. Retailers have entered into long term PPAs with windfarms to meet much of their expected LRET requirement in the near term. As a consequence the contract market only represents a modest proportion of instruments traded by Standard Retailers.

Liquidity in the contract market has been further reduced in recent years due to uncertainty created by the lead up to Clean Energy Act and lately due to uncertainty created by the RET review.

Given the benefit of ensuring consistency of approach between wholesale electricity cost estimates and RET costs and the contract market liquidity issues, Origin supports the calculation for the price of LGCs based on an estimate of the LRMC of wind generation.

5.2 Costs of complying with the SRES

Frontier notes that fixed price of $40/STC was used in 2010, but that STC's have since traded on the open market at lower prices. Frontier also notes problems with using market approach; namely that discounted price available on the open market may be the result of temporary market dynamics and difficulties modelling the market for STCs in any robust way. Under the current legislation STCs should trade at the Clearing House price except where parties seek a discount to reflect early settlement.

Origin recommends that the Clean Energy Regulator's recent estimate of the STP for calendar years 2013 and 2014 be used and that the Clearing House price of $40 per STC be applied.

6. Ancillary services costs

6.1 Ancillary services
6.2 Estimating ancillary services costs

In its advice to IPART for previous determinations, Frontier has forecast ancillary services costs on the basis of econometric modelling of historic ancillary services costs, and it proposes to adopt the same approach for the 2013 determination. Origin supports this approach.

PART B - Input assumptions

7. Overview of input assumptions

While in prior determinations IPART instructed Frontier to adopt input assumptions for electricity market modelling from third-party reports, for the 2013-16 determination IPART has decided to develop its own input assumptions. Frontier has been engaged to advise IPART on these input assumptions, with a particular focus on regulated load forecasts, capital costs of new entrant generation plant and fuel costs for existing and new entrant generation plant. Origin welcomes this approach.

Origin has in previous submissions expressed concern that estimates of generation capital and fuel costs used in industry planning processes do not reflect recent industry costs. Origin notes that a set of generation and fuel costs assumptions have recently been issued as part of the National Transmission Network Development Planning process. Origin does not believe these costs are a reasonable estimate. The fuel costs have again been based on ACIL Tasman's data set, as Origin has previously observed these significantly understate the reasonable costs of coal production. Similalry Worley Parsons estimates of developing CCGT plant are well below Origin's recent experience.

Origin has attached to this submission a letter to the Bureau of Resource and Energy setting out Origin's view of capital and fuel costs based on its market experience. Origin would welcome the opportunity to discuss this further with IPART and its consultants.

8. Demand

8.1 System load
8.2 Regulated load

In prior determinations IPART instructed Frontier to base its forecasts for system load in each NEM region on the forecasts published by AEMO. IPART proposes to adopt the same approach for the 2013 determination, making use of AEMO's National Electricity Forecasting Report 2012. Frontier proposes to use:

- medium growth 50% POE projections;
- medium growth 10% POE projections for summer and winter for the purpose of modelling reserve constraints;
- a range of possible load outcomes for calculating wholesale energy costs under the market-based approach under system demand cases for both the 10% and 90% POE projections.

IPART notes that AEMO has revised its approach to load forecasting and is continuing to work on improving its forecasts. Origin is broadly comfortable with applying AEMO load forecasts.

In terms of the regulated load, Frontier has noted that it will advise IPART on developing the forecasts of the two regulated load profiles in consultation with the Standard Retailers.

The terms of reference require IPART to derive a load shape for customers consuming 0-100MWh pa. This shape is likely to be a lower load factor than the equivalent blend of Net System Load Profile (NSLP) and controlled load profile. As only a small number of Origin's 100-160 MWh pa customers have interval metering, Origin is limited in its ability to derive an accurate estimate of the profile for 0-100MWH customers. In this regard, Origin suggests that IPART consider seeking historical load data from NSW distribution companies in order to adjust the NSLP to exclude those customers consuming >100MWh pa.

9. Existing generation plant

9.1 Identifying existing generation plant
9.2 Costs
9.3 Technical characteristics
9.4 Verification based on historical data for existing generation plant

As the builder of the NEM's largest CCGT plant (644MW, 2010) at Darling Downs in Queensland, and the most recent builder of OCGT in the NEM at Mortlake in Victoria (55MW, 2010), Origin is well placed to comment on the realistic cost of new plant build in the NEM.

Many of the new build costs incurred do not form part of a typical EPC contract and are therefore difficult to identify by consultants reviewing published EPC tender results. There are many additional costs that must be borne by the owner in order to bring the project to completion. Also, projects in Australia have historically run over budget, on average NEM costs have been approximately 10% above initial estimates.

Frontier has stated that generation plants that are part of the least-cost mix will likely include coal-fired, CCGT, OCGT. Frontier has proposed that generation plant be located in a sub-region of NSW where fuel is available.

Origin notes that the Mortlake CCGT had a capital cost equivalent to $1.5m/MW and would be pleased to provide additional confidential information regarding new build costs.

10. New generation plant options

10.1 Generation technologies
10.2 Costs
10.3 Technical characteristics

For the purpose of a stand-alone LRMC modelling approach, Frontier proposes assessing the generation technologies that have the potential to form part of the least cost mix of generation technologies over the pricing period, which are essentially the generation technologies that are available today.

In determining the LRMC it is important that the assumed life of the plant reflects the expected amortisation period applied to finance a project (around 25 years), rather than an engineering estimate of the useful life of the asset.

11. Fuel cost assumptions

11.1 Gas market forecasts
11.2 Coal market forecasts
11.3 Average or marginal fuel costs

At this stage, Frontier is not providing detailed information on input assumptions to be used in its forecasting of gas costs and coal costs.

Frontier proposes to forecast gas costs for generation plant in the NEM using *WHIRLYGAS*, a model which optimises total production and transport costs in gas markets, calculating the least cost mix of existing and new infrastructure to meet gas demand. Gas demand forecasts from the Gas Statement of Opportunities can be directly incorporated into *WHIRLYGAS*, and Frontier proposes that these forecasts me a starting point for gas market modelling.

Origin is well-placed to comment on gas forecasts. Our most recent project Mortlake was opened. Mortlake is a 550MW plant with a project cost of $800m ie $1.5m/MW.

Frontier proposes to work with Metalytics Pty Limited to provide coal market analysis and forecasting to construct forecast coal supply curves for each sub-market. Origin has had recent experience in managing and procuring coal contracts in NSW through our Gentrader contract with Eraring Power Station (2,800MW), which requires procurement of more than five million tonnes of black coal annually. As a customer of the proposed Cobbora coal mine development we also have valuable insight into the costs of new black coal mine development in NSW.

Origin welcomes IPART using its own datasets and cautions against over-reliance on data provided by third party sources. For example, Origin considers that that the costs of acquiring coal, particularly for a new entrant plant, are significantly higher than estimated by ACIL Tasman. In our approach to assessing the costs,

Origin has taken input costs as presented by ACIL and used internal and consultant based production costs to recalculate netback and production costs according to our experience. Using realistic assumptions for production costs and export parity values, we estimate that black coal prices for mine-mouth power plant in the NCEN and NNS regions should be A$2.75-3.25/GJ over the long term. This is 60-70% higher than ACIL Tasman's values of A$1.60-2.01/GJ.

Origin considers that ACIL Tasman's prices are too low due to unrealistic assumptions regarding production costs, export coal prices and the ability of customers to contract below international parity. Origin's direct experience in contracting with suppliers and dealing with consultants and mine operators suggests that these underlying assumptions do not align with the true cost of procuring coal. In Origin's experience, domestic coal sales are not attractive to mine owners and a new entrant procuring coal supply would have to pay 100% of the export parity value. Long term export coal price forecasts from the International Energy Agency and consultants Wood Mackenzie are US$100-110/t. Applying an exchange rate no higher than US1.00/A$ give a long term export coal price of at least A$100/t.

While the price of Cobbora coal is frequently cited as evidence of low domestic coal prices, there is reason to believe the figure of $1.50/GJ does not reflect market prices. During the Budget Estimates of the NSW Legislative Council in October 2011, the Parliamentary Secretary stated that the Ernst & Young estimated a negative net present value of $550m, of which approximately $300m is a cost to the government. The discrepancy between the total negative impact to the (government-owned) mine and the total negative impact to the government itself suggests that there is a positive impact of the government also being a customer of the mine project, ie that the government has secured coal supply at below-market prices.

12. Carbon cost assumptions

12.1 Incorporating carbon costs
12.2 Potential carbon forward prices

Assumed carbon prices are incorporated in all of Frontier's modelling. Origin supports Frontier's general approach of incorporating carbon costs as an increase in the variable operating costs of production.

Attachment 2. Weighted Average Cost of Capital Issues (WACC)

Origin's response to the issues set out in the WACC, Electricity - Draft Methodology Paper are set out below. Origin's responses relate to electricity generation and retail and do not consider gas production, gas transmission, LNG facilities and coal mining businesses.

Are there significantly greater difficulties in moving to a post-tax WACC in the 2013 electricity determination than in IPART's determinations in other industries?

The integration of market participants within the electricity market presents a significant hurdle when moving from a pre-tax to a post-tax WACC. Unlike the other businesses which are regulated under a detailed building block approach (i.e. Sydney Water, Hunter Water), electricity participants (including Origin) have deeply integrated operations across the whole supply chain making it difficult to isolate the tax position of the regulated activities by splitting regulated and unregulated operations.

1. **What is the appropriate benchmark for estimating the risk free rate for electricity generation, electricity retail, gas production, gas transmission, LNG facilities and coal mining businesses?**

Origin considers that it is appropriate to use the yield on a 10 year Australian Government Bond as a market proxy for the Risk Free Rate.

To remove the short term impact of any abnormal market conditions, a normalised view of 10 Year Australian Government Bond yields should be made by reviewing the individual components, the "implied real Risk Free Rate" and "implied inflation expectations".

To illustrate, the current European Debt Crisis has led to a "flight to quality" which has resulted in yields on 10 year Australian Government Bonds falling abnormally over a short period of time. Despite this fall, it is not clear that such a decrease has been reflected in the cost of equity (of which the Risk Free Rate is a major component). Accordingly, current market uncertainty has meant that taking a short term average of the 10 year Government Bond is not appropriate.

Origin believes that the Risk Free Rate should be reflective of the long term which is consistent with IPARTs position in the SDP decision in December 2011 that it is more important to adopt long term parameters for the Risk Free Rate.

Accordingly, where the spot rate (or short term average) yield on 10 year Australian Government Bonds doesn't accurately reflect the long term rate i.e. is depressed or inflated, the implied real Risk Free Rate and inflation expectations should be used to determine the long term Risk Free Rate.

2. What is the appropriate approach to determining the market risk premium (MRP) for the 2013 determination?

As the MRP is a measure of the long term excess return earned on a diversified portfolio of equities over the risk free return, the MRP should be a long term estimate.

Current long term estimates of the MRP for the Australian market typically have been around six per cent as adopted by Australian valuers and regulators as supported by academic research. As the attached PwC report highlights, 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. A number of examples from the recent independent expert reports are discussed in more detail in the PwC report.

Additionally, the time horizon of both the MRP and the Risk Free Rate should be aligned to ensure consistency between key inputs in the WACC. If a long term MRP is applied with a short term Risk Free Rate then the resulting rate of return is likely to underestimate the required rate of return.

3. What is the equity beta and associated gearing for electricity generation, electricity retail, gas production, gas transmission, LNG facilities and coal mining businesses, and what is the supporting quantitative evidence?

The approach for determining the equity beta of comparing the betas of proxy companies, professional valuations and other regulatory decisions is considered reasonable. The gearing ratios used to convert the equity beta into an asset beta should be consistent with those adopted in other elements of the WACC.

When assessing the appropriateness of the resulting asset beta, IPART should consider the implied systematic risk in the specific industry and assess the appropriateness giving consideration to other industries for which a WACC is determined.

The main systematic risk faced by an Australian electricity retailer is regulation of the energy market (both in relation to retail tariffs and environmental policy e.g. carbon and large-scale renewable energy target) while a stand-alone generator is exposed to volatility in the wholesale energy markets which is influenced by many factors which are difficult to predict.

4. Are there any issues with IPART using a gamma assumption of 0.25 for the 2013 determination?

IPART's report '*Review of imputation credits (gamma) – Research – Final Decision*' (the IPART Gamma Report) was released in March 2012. In the IPART

Gamma Report, IPART determines to apply a gamma of 0.25 for future price determinations.

Origin observes that financial practitioners do not generally apply a gamma when assessing WACC for retailers or generators and therefore proposes that gamma be set to zero.

5. a) How should the debt margin be estimated for the 2013 determination?

b) Is our current approach of using a BBB/BBB+ credit rating assumption appropriate for our current benchmark business?

a) The Bloomberg 7 year BBB fair value curve represents an appropriate benchmark for setting the debt margin. While the Bloomberg curve may occasionally not reflect current market conditions, it provides an observable, vetted benchmark which is straightforward to apply. Further support behind the adoption of the Bloomberg fair value curve is set out in Section 4.1.2 of the attached PWC report.

As a 10 year time horizon is used for determining the Risk Free Rate, the debt margin should also reflect a 10 year tenor. To this end, an adjustment should be made to the Bloomberg 7 year BBB fair value curve to reflect differing costs associated with a longer tenor. Debt raising costs should also be included as contemplated in Question 7 below.

b) The credit rating assumption of BBB/BBB+ appears reasonable when considering the average credit rating of Australian electricity generators and retailers.

6. Is the inclusion of a 20 basis point allowance for the debt raising costs (based on a 5-year maturity period) appropriate for the 2013 determination?

Origin believes that a 20 basis point allowance for debt raising costs is appropriate.

7. What are the appropriate gearing ratios for electricity generation, electricity retail, gas production, gas transmission, LNG facilities and coal mining businesses? How should our gearing ratios relate to the benchmark credit rating assumption?

Gearing ratios adopted should be consistent with the benchmark credit rating. In the IPART draft report whereby gearing of 50% was adopted for generation, the

level of gearing assumed was inconsistent with the BBB/BBB+ rated bonds adopted and more akin to that of project finance.

Gearing ratios for large Australian energy utilities with an investment grade credit rating are in the range of approximately 15-25%.

8. What information should IPART consider in choosing an appropriate point within the WACC range?

Where IPART determines a range for a specific parameter, it should apply a consistent methodology when selecting a value within that range. As part of the consultation process, IPART should consider the point selected having regard to the range or value derived by the market participants.

The resulting WACC should also be reviewed for overall appropriateness in light of other relevant information and in consultation with market participants.

9. How should internally consistent individual WACC parameters be determined?

As detailed above, it is important to ensure that the parameters of the WACC are internally consistent. Internal consistency should be maintained in relation to, inter alia, the time horizon for the risk free rate and cost of debt, and the benchmark credit rating and gearing levels.

Where IPART determines a range for a specific parameter, it should ensure that the methodology to select the value within that range remains consistent.

10. Which parameters of the WACC should be updated as part of any annual review?

Origin believes that IPART should review the key parameters being the risk free rate, market risk premium, beta and cost of debt as part of its annual review. However, as the parameters should reflect the long term view, it is not expected that an annual review would lead to material changes in the adopted WACC and in turn a high level of regulatory uncertainty.

2 July 2012

Attn: Mr Quentin Grafton
Executive Director/Chief Economist
Bureau of Resources and Energy Economics (BREE)
Department of Resources, Energy and Tourism
info@bree.gov.au

Dear Mr Grafton,

Origin is pleased to have the opportunity to contribute to the AETA process and welcomes any direct correspondence sought with Origin regarding the views expressed in this submission.

As the NEM's largest operator of generation capacity Origin has significant experience in contracting and sourcing coal and gas resources for our 5,310MW portfolio of dispatchable generation. Origin also holds experience in plant construction from generation projects at Darling Downs in Queensland (2010) and Mortlake in Victoria (2011), as well as holding a significant investment in CSG through Australia's largest 2P CSG reserves, and with binding sales of 8.6Mtpa of LNG. This positions Origin well to contribute to the recent studies conducted by both ACIL Tasman and WorleyParsons for the AETA Stakeholder Reference Group.

Although supporting the concept of a single data set for use in comparison across technologies, Origin recognises that such a data set will realistically only be useful for comparison purposes rather than for use in determining the cost of energy or required LCOE of new entry in a particular NEM region. While site specific costs which cannot be easily summarised across technologies or regions, Origin would like to ensure that any limitations to the use of data are acknowledged in the release of data.. Origin's concerns with the data presented to date are discussed below.

Origin is also willing to provide information on a confidential basis to justify the statements made within this response.

ACIL Tasman 'Fuel cost projections for AEMO/DRET'

Origin has had recent experience in managing and procuring coal contracts in NSW through our Gentrader contract with Eraring Power Station (2,800MW) requiring procurement of more than five million tonnes of black coal annually. Through our involvement as a offtaker of the proposed Cobbora coal mine development we also have valuable insight into the costs of new black coal mine development in NSW.

From this experience we observe that the reported costs of acquiring coal, particularly for new entrant plant, are significantly higher than estimated in the ACIL report.

In our approach to assessing the costs, Origin has taken input costs (such as $AUD export price assumptions) as presented in the ACIL presentation and used internal and consultant based production costs to recalculate what our experience indicates netback and production costs to be.

Using realistic assumptions for production costs and export parity values, we estimate that black coal prices for a mine-mouth power plant in the NCEN and NNS regions should

be A$2.75-3.25/GJ over the longer term. This is 70-85% higher than ACIL Tasman's values of A$1.60-1.75/GJ.

ACIL Tasman's prices are too low due to unrealistic assumptions regarding production costs, export coal prices and the ability of customers to contract below international parity:

- Using ACIL Tasman's assumptions of A$80/t for export coal and a domestic customer paying 80% of export parity value, we calculate domestic coal prices between A$1.76/GJ for the NNS region and A$1.96/GJ for the NCEN region, broadly consistent with the A$1.60-1.70/GJ long-run prices quoted by ACIL Tasman. Thus we believe that we are consistent with ACIL Tasman on inputs such as rail costs, port costs and yields for export coal.

However, Origin's direct experience in contracting and through our discussions with consultants and mine operators suggests these underlying assumptions do not align with the true cost of procuring coal.

- Based on Origin's negotiations with mine owners, domestic coal sales are not attractive to them (see "Export Competition" section) and a new entrant would have to pay 100% of the export parity value to secure coal
- Long-term export coal price forecasts from the International Energy Agency and consultants Wood Mackenzie are US$100-110/t. Applying an exchange rate no higher than US$1.00/A$ gives a long-term export coal price of at least A$100/t
- The ACIL report itself quotes ROM costs of between $1.94/GJ and $2.20/GJ for NSW mines - these costs should be expected to increase over time as more difficult seams are mined, which contradicts the falling estimates in ACIL's final analysis.

While ACIL calculates the coal price as the maximum value of 80% of netback or the production costs, for the sample mine set (excluding Maules Creek as being predominantly metallurgical) Origin's equivalent modelling indicates that:

- Weighted average mine-gate production costs for representative mines of A$2.47/GJ for the mines quoted in the report, based on engagement with coal consultants and mine operators.
- We calculate export parity values at the mine of A$3.06/ GJ for the NNS region and A$3.27/GJ for the NCEN region, based on external assumptions of A$100/t for long-term export coal prices and a domestic customer paying 100% of export parity value.

On a confidential basis Origin is prepared to share our internal calculations to assist the process in showing a true reflection of the component costs of procuring coal.

Export Competition

Of the 7 NSW deposits identified by ACIL Tasman, 5 are strongly committed to export markets:

- Maules Creek contains 84% metallurgical coal, and will be developed for metallurgical coal export customers who pay a premium over thermal coal prices.
- Narrabri, Boggabri, Ulan and Moolarben are operating mines that export most of their output. The mine owners have binding contracts for rail and port capacity for the next ten years, and in some cases have made significant investments in building their own port facilities.

- In the case of Boggabri and Moolarben the mine owner is an overseas coal company with a corporate strategy of securing Australian coal supply for Japanese and Chinese consumers.
- It would be difficult to secure domestic supply from Narrabri, Boggabri, Ulan and Moolarben given the competing incentives for exports. It is expected a domestic consumer would have to offer 100% of the export parity value.

Remote Locations

ACIL states that the cost presented in the report is to a local power station, which we presume means transport costs of less than 10km. However, this simplification ignores the remoteness of the deposits summarised (ACIL: slide 4).

The 7 NSW deposits identified by ACIL Tasman are all remote from existing generators and power demand centres. Rail hauls from the NNS and NCEN regions to Hunter Valley or Central Coast generators near the power demand centres would be 150-450km, adding A$0.40-1.20/GJ to the coal price[1]. For the SWNSW region the distance to the Lithgow area power generators is 550km, and there is no existing coal rail infrastructure, so transport to generators near power demand centres would add at least A$2.00/GJ to the coal price[1].

For the alternative case of building a power plant adjacent to the mine, the power plant would require 150-550km of new transmission lines to join the existing power network, adding additional cost. Recent estimates[2] of transmission costs have been in the vicinity of $2m/km for a line of sufficient capacity to suit a large baseload power station. This places transport costs of over $1 billion dollars for the suggested regions, and also ignores the cost of transmission losses over a long distance cable. Simply assuming away these quantifiable factors significantly underestimates the true cost of sourcing energy and diminishes the relevance of the study.

In reality, any new power station will either have to pay to transport the fuel to avoid transmission costs, or pay to construct transmission to avoid fuel transport costs. This implies that the prices quoted do not reflect the true cost of energy. One major concern with this simplification is that if the ACIL fuel costs presented are used without adjustment as a delivered price in the WorleyParsons LCOE modelling, the true cost of energy will be vastly understated and then this limitation if not adjusted should be clearly noted in the release of the study results.

Queensland Coal

Coal resources in south-east Queensland's Surat Basin have limited export opportunities at present, but will be exposed to export parity pricing from 2015 after the completion of the Surat Basin Rail link. Export capacity from the Surat Basin is currently 10 Mtpa through the port of Brisbane, but the new rail link and associated port expansions will add 42 Mtpa of export capacity through the port of Gladstone.

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[1] Based on internal estimates
[2] AEMO, NTNDP 2011

After 2015 coal resource owners in the Surat Basin will be able to choose between export and domestic markets based on which offers the best return, and coal supplies for generation in south-east Queensland will be priced at export parity value.
Add estimated export parity costs in QLD.

WorleyParsons 'Electricity Generation Technology Cost Assessment'

Origin welcomes the improvement in transparency of reported technology cost assessments in recent years, and that the proposed level of transparency in this report furthers this standard.

As the builder of the NEM's largest CCGT plant (644MW,2010) at Darling Downs in Queensland, and the most recent builder of OCGT in the NEM at Mortlake in Victoria (550MW, 2011) Origin is well placed to comment on the realistic cost of new plant build in the NEM which are presented in the WorleyParsons report.

While recognising that in any technology cost assessment numerous simplifications are required to allow a broad based comparison across technologies, where costs are omitted (such as pipeline or transmission costs) these omissions should be clearly noted if not quantified, particularly when referring to a calculated LCOE.

It should also be highlighted that because for thermal plant a significant portion of the LCOE calculation is related to the fuel cost component, caution should be exercised in the use of ACIL coal costs in estimating the cost of generation as over simplification at many stages of the process can cause considerable inaccuracy in the end results.

The Capital cost estimates put forward by the AETA process for CCGT and OCGT technology costs are low compared to Origin Energy's previous experience.

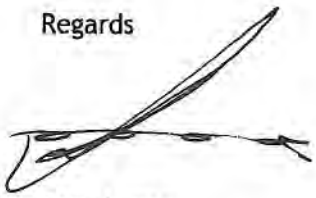
This seems to be due mainly to site specific factors which do not appear to be captured in the generic technology estimates covered in the AETA analysis. However, clarification should be made clear that these costs are likely to be significant.

CCGT (Plant type 16 in the WorleyParsons modelling)

Origin Energy owns the largest CCGT plant in Australia in DDPS (commissioned in 2010). Furthermore, Origin received budgetary pricing for another CCGT in mid 2011.
Many of the costs that are incurred do not form part of a typical EPC contract - there are many additional costs that must be borne by the owner in order to bring to project to completion. Also, projects in Australia have historically run over budget, on average NEM costs have been approximately 10% above initial estimates.
Furthermore, while specific details were given in the report regarding turbine type and manufacturer, some additional details (for example whether or not the unit would include an allowance for air cooled condensors) were not immediately clear, and could help account for the differences between reported cost and Origin's higher internal estimate.

Origin welcomes a confidential discussion on a more detailed breakdown of these costs. Please feel free to contact myself or James Cameron, Manager Market Economics on 0457 519 571 if you wish to discuss further.

Regards



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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

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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.

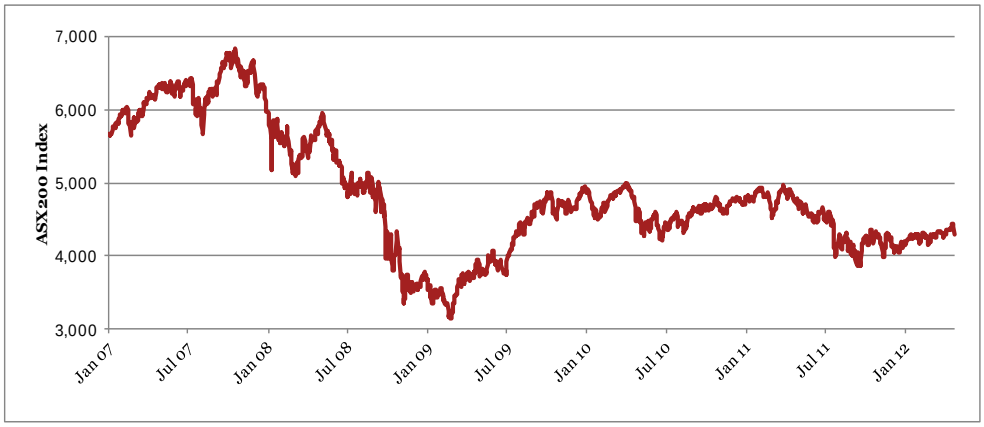
Flight to quality

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

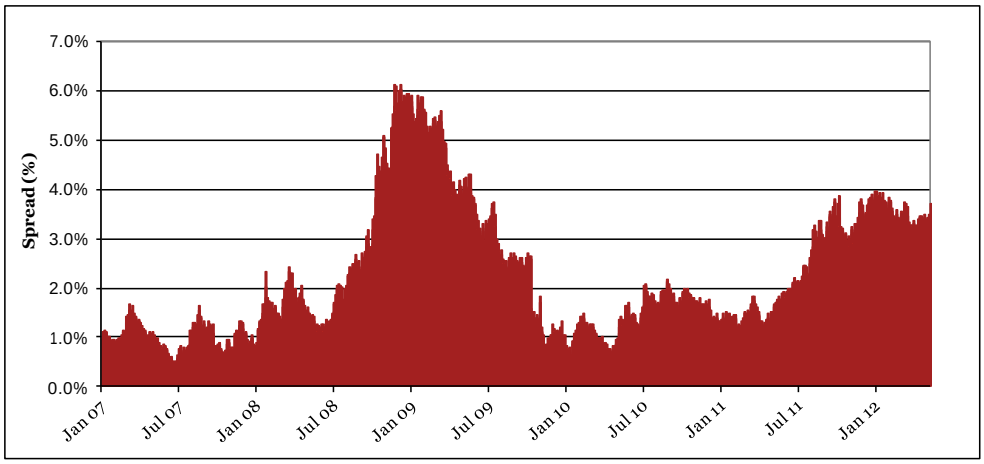


Source: Bloomberg

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:

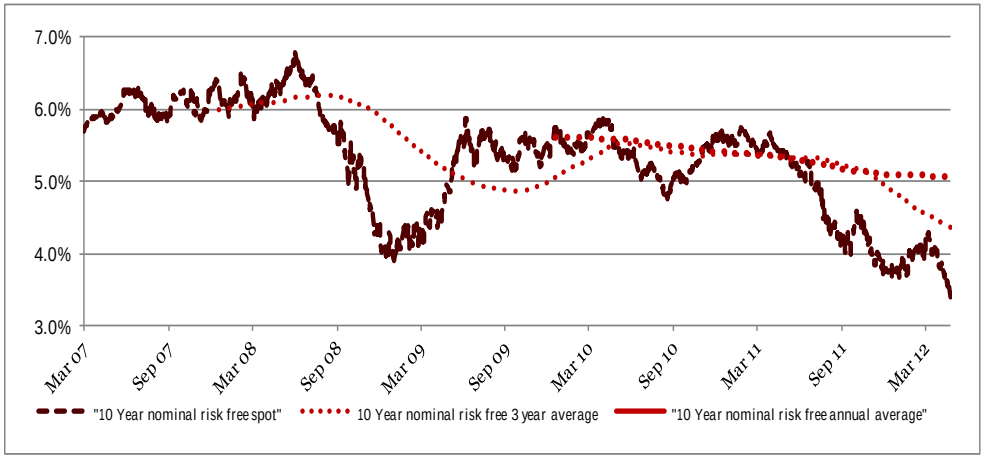
- Adding an amount to the spot measure of Rf; or
- Adjusting the measure of MRP used to reflect an additional short term component of risk over and above the depressed measure of Rf.

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

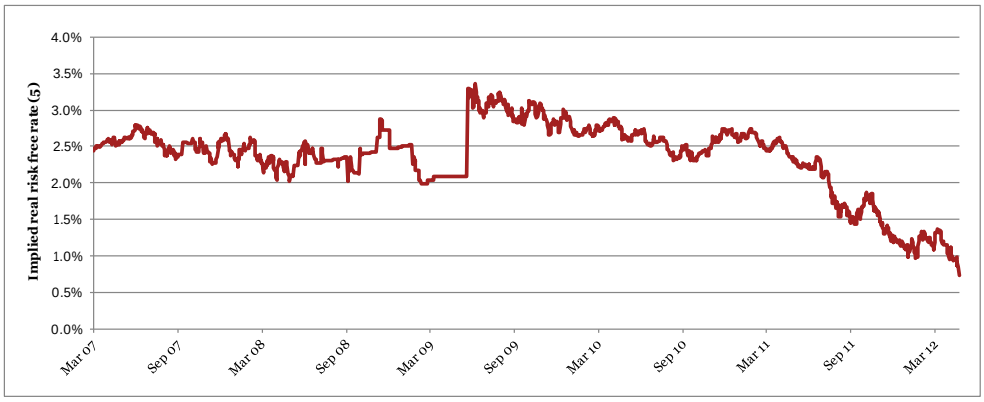
In addition for the purposes of considering a normalised Rf rate at a current date, it is appropriate to estimate a longer term measure of the real Rf rate and the financial market estimate of future inflation. The yield on Government Bonds has two components being a real yield and a long term inflation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

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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

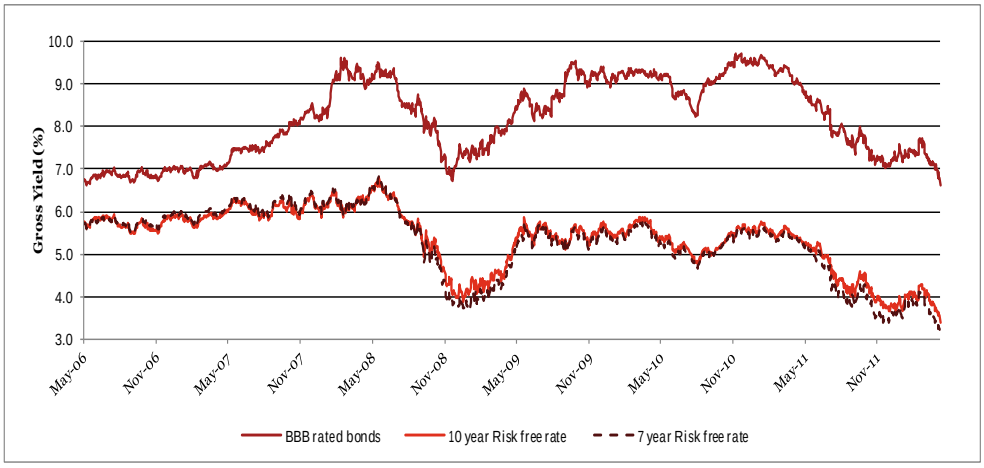
We observed the 7 year BBB corporate bond yields as at 7 May 2012 to be as follows:

- 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

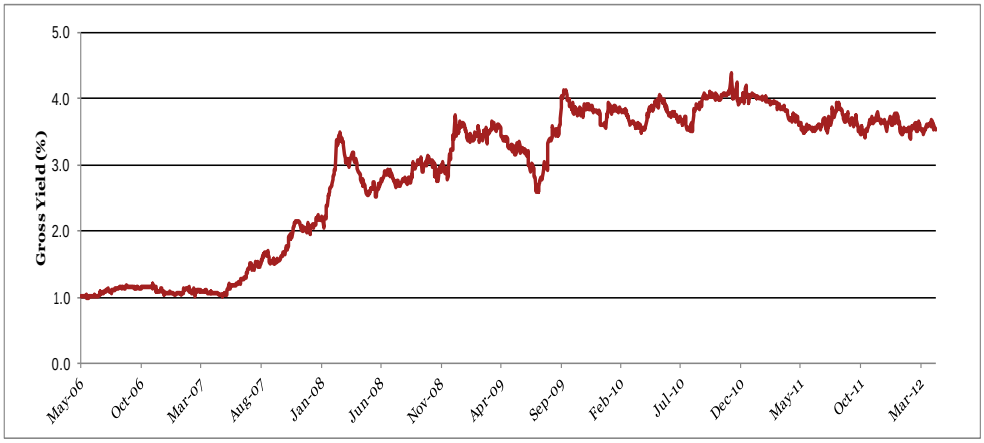


Source: Capital IQ

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 0f 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

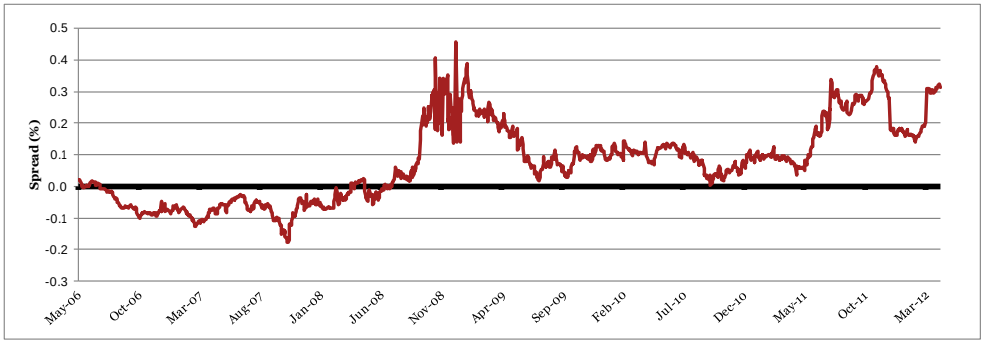


Source: Capital IQ

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.

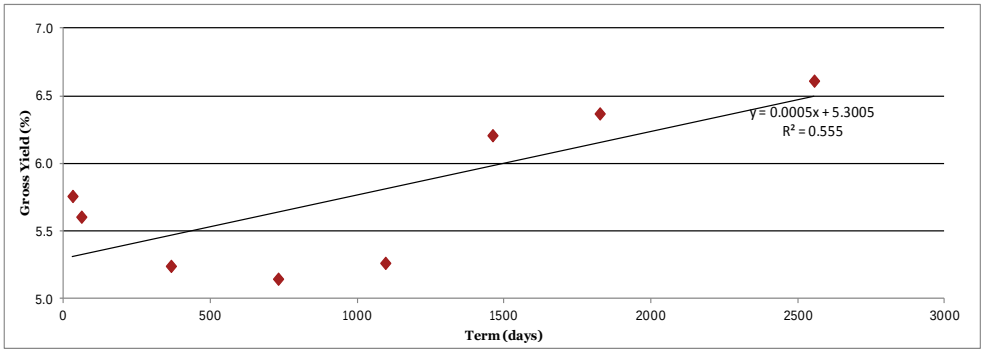
Cross checking the additional spread for tenor

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.

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