Financing Practices Under Regulation: Past and Transitional

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CHAIRMONT
ADVISERS+IMPLEMENTERS

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Australian Energy Regulator (AER) determines a return on debt allowance within the Weighted Average Cost of Capital (WACC) as part of its revenue determinations for Network Service Providers (NSPs). It has decided to change the measurement approach for the return on debt from an 'on-the-day' to a trailing average approach, and specified transitional arrangements between the two methods. NSPs in Queensland, Victoria, Australian Capital Territory (ACT), Northern Territory (NT) and South Australia have submitted transitional proposals which are currently being considered by AER.

As the basis for the trailing average measurement and the transition from the 'on-the-day' regime, AER examines debt portfolio management strategies required to be undertaken by a Benchmark Efficient Entity (BEE).

AER's aim is for the transitional allowance to contribute to the achievement of the allowed rate of return objective by providing a BEE with a reasonable opportunity to recover its efficient financing costs over the life of its assets, taking into account any impact on that from a change in the regulatory regime[1].

1.2 SCOPE OF WORK

In summary, AER seeks:

- Advice on the Efficient Financing Practices (EFPs) of a BEE under the previous 'on-the-day' approach, and therefore what the debt portfolio of a BEE would be at the start of the new regulatory period, along with what EFPs a BEE would adopt under AER's transition approach.
- Advice on the extent of any over or under recovery of borrowing costs experienced by a BEE in the circumstances of particular service providers under the previous 'on-the-day' approach, and under AER's transition approach. Equity beta impacts are to be considered.
- A review of information on the actual financing practices and costs of particular service providers, which may inform the answers to the above issues.

1.3 OUR APPROACH

Our review of the material has identified a number of key considerations that have been summarised below, and supports our approach, as illustrated in Diagram 1.

1.3.1 Overall Process

Comparison of EFPs

AER has in recent publications referred to one particular EFP, which we will call the Basic Approach here. It states that the BEE under the 'on-the-day' regime would[2]:

- Borrow long term (10 year) debt and stagger the borrowing so only a small proportion (around 10 per cent) of the debt matured each year.

[1] [1] The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of regulated network services. Refer Appendix A.
[2] Refer Appendix A.

- Borrow using floating rate debt, or borrow fixed rate debt and convert it to floating rate debt using fixed-to-floating interest rate swaps at the time of the debt issue, which extended for the term of the debt (10 years).
- Enter into floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period, which extended for the term of the access arrangement period. This was typically five years.

The steps in undertaking a comparison are:

1. Define possible EFPs which may have led to higher funding costs, including the partial trailing fixed rate and any other suggestions by NSPs.
2. Define possible EFPs which may have led to lower funding costs, including the shorter term issuance suggested by AER.
3. Examine the time variability of any EFPs.
4. Quantify the current cost base for the basic and alternative EFPs.

Compensation Factors: Overs and Unders, and Equity Beta

The steps are:

1. Examine the relevance and likelihood of multi-period overs or unders, not only in the Debt Risk Premium (DRP), but also in the total cost of debt.[3]
2. Quantify outcomes of specific regulatory periods.
3. Assess from a qualitative, not quantitative perspective, any compensation provided by a higher equity beta.

Provider Responses

AER requested information on actual financing practices and costs from privately owned NSPs with current resets. Chairmont's brief included an examination of this information.

The steps are:

1. Determine whether each NSP answers the questions.
2. Establish the actual funding and hedging activities of recent times. This will be a snapshot assessment, rather than a complete historical analysis.
3. Define a common format and harmonise responses.
4. Assess the extent to which industry data supports the Basic Approach EFP and related cost of debt outcomes from the conceptual and quantitative sections of this report.
5. Determine implications, if any.

[3] DRP refers to the spread of a corporate bond over the corresponding swap rate, rather than over the government bond rate, unless otherwise specified.

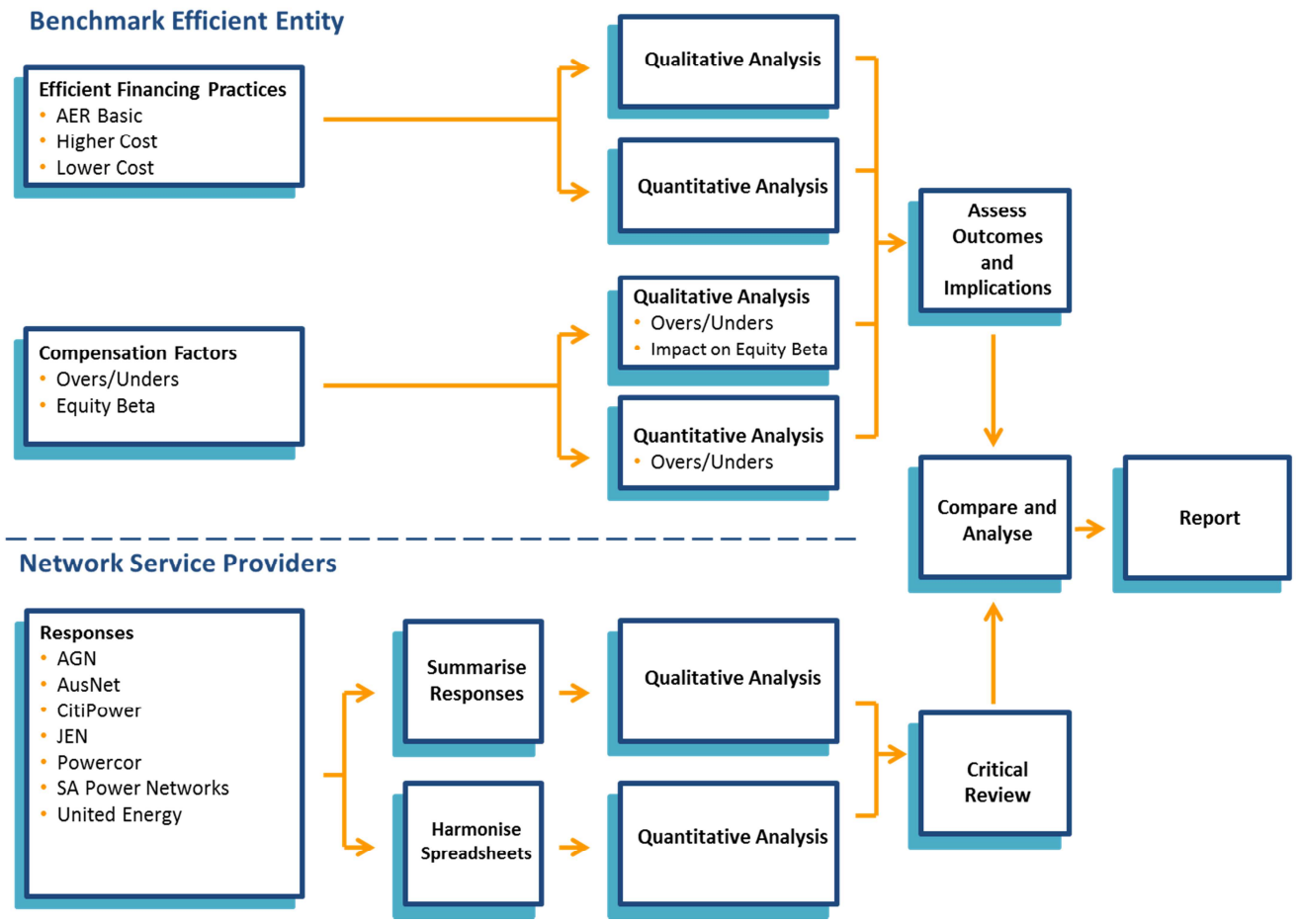


Diagram 1: Our Approach – Overall Process

1.3.2 Approach to Comparison of Financing Practices

Diagram 2 shows the internal and external factors that influence the decision variables defining a financing strategy. Variation of those decision variables leads to different implemented strategies which can be compared qualitatively and quantitatively.

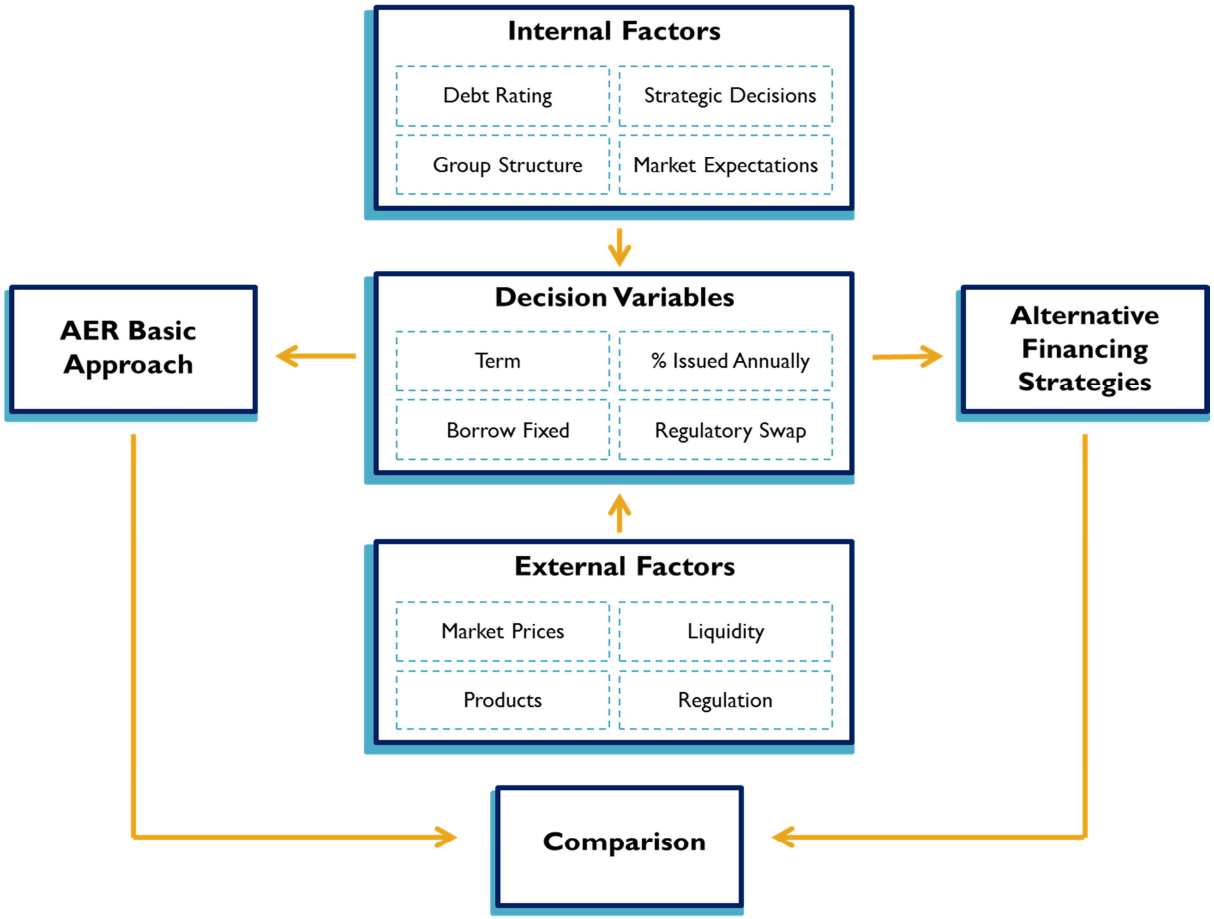


Diagram 2: Our Approach – Alternative Financing Practices

Diagram 2 shows that:

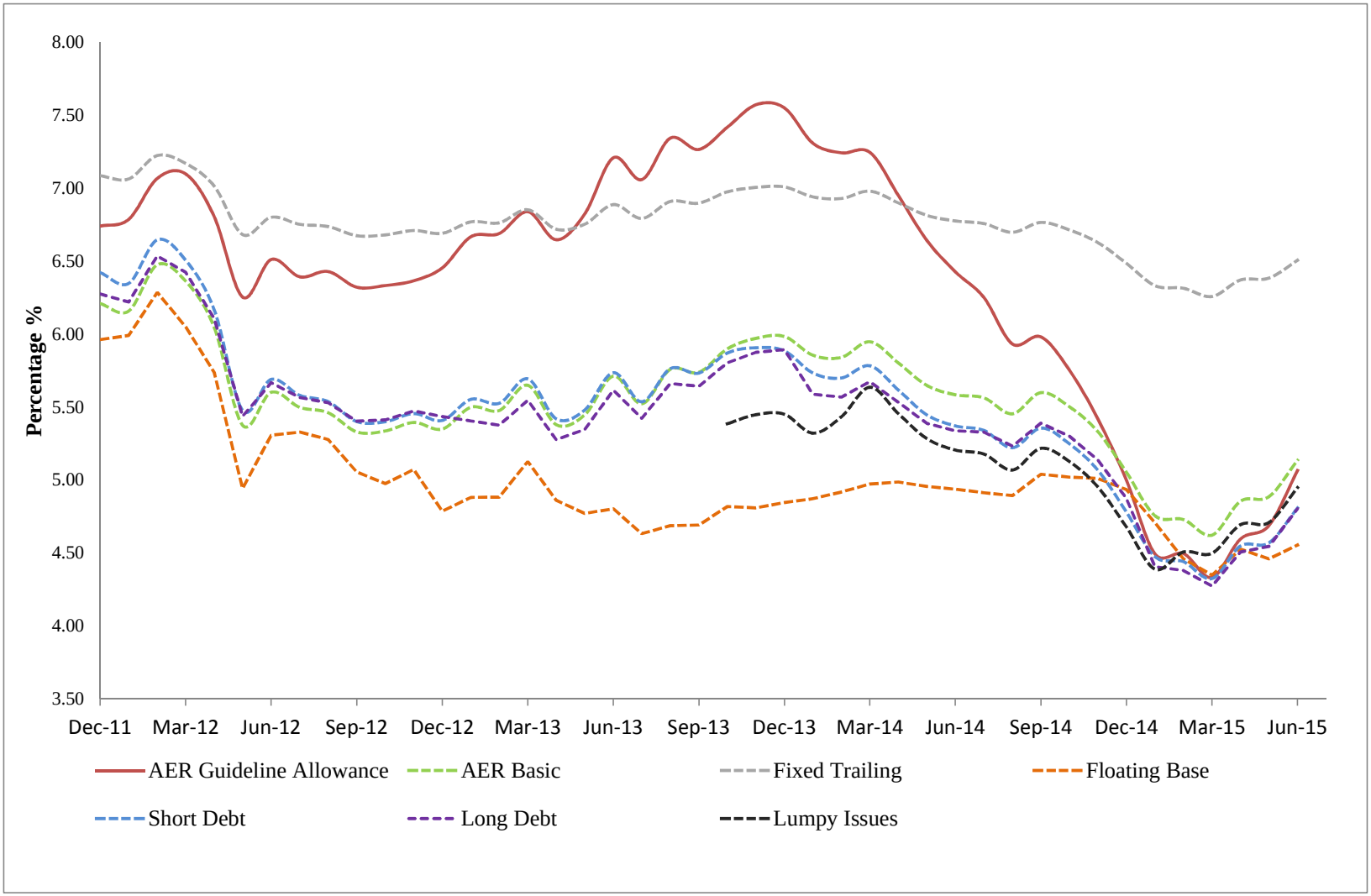
- Financing strategies are influenced by internal and external factors, along with decision variables, i.e. levers that determine the financing practices adopted.
- Different financing practices can be created by altering the four key decision variables referred to in AER's Basic Approach. These are:
    - The term of the debt raised.
    - The percentage issued annually.
    - Whether debt is raised as effectively fixed or floating rate.
    - Whether pay-fixed swaps are used to coincide with the regulatory period.
- A range of financing practices may be adopted and are summarised under the following categories:
    - AER Basic Approach. This is described in Section 1.3.1 above.
    - Strategy 1: Fixed trailing average. Some proportion of debt is issued each year as fixed rate debt, or as floating rate and swapped to a fixed rate at the time of issue.
    - Strategy 2: Floating unswapped. A proportion of debt remains with a floating base rate, rather than using a pay-fixed swap at the start of the regulatory period for the total debt amount.
    - Strategy 3: Short term debt. Each year some proportion of debt is raised with terms of less than 10 years. The remainder is issued as 10-year debt.
    - Strategy 4: Long term debt. Debt is issued with maturities beyond 10 years, whenever the market allows.
    - Strategy 5: Lumpy issuance. More than 10% of total debt is issued in years when conditions are considered favourable, or the standard 10% if not.
    - Strategy 6: Subordinated debt (including hybrid structures). Some of the debt requirement is issued as subordinated or in some other way equity-hybrid form of debt.
    - Strategy 7: Enhanced debt (credit). As for Strategy 6; however with credit enhancement features, e.g. guarantee, credit wrap or asset-backed securities that improve on the NSP's normal credit rating.
    - Strategy 8: Combinations of the above.

Analysis was also undertaken to compare the strategy results to AER's return on debt allowance from the 2013 published transitional guidelines. The Guideline Allowance adopts the prevailing 10-year bond rate as the determinant for the first year of the transitional period. Following this, the allowed return on debt will transition by 10% per year to a trailing average portfolio. The implication of this approach is that the initial rate setting of the transitional period acts like an 'on-the-day' measurement with a progressively declining impact over 10 years.

1.4 FINDINGS

1.4.1 EFP and the Allowed Return on Debt

Using hypothetical transitional start dates from 2011 to 2015, the following key results and insights for a BEE moving into the new regulatory regime are observed. A numerical overview is provided by Graph 1. Strategies 6, 7 and 8 are not measured due to the multitude of possible variations and the inclusion of non-vanilla debt would not provide an 'apples to apples' comparison.



Graph 1: Point in Time Analysis - Cost of Debt at Transition Commencement

Graph 1 displays the rate for the debt portfolio in the first year of the transition period. The lines represent the relativities between strategies for each different point in time. They do not represent an ongoing cost for a single NSP. For example, the date of December 2011 shows the calculated cost of debt or allowance which would occur for a hypothetical transition period commencing in December 2011.[4]

Financing Practices

The key findings are:

- Regardless of the financing strategy and even when there are minor differences in the starting date, the relative and absolute costs vary considerably.
- Many of the strategies produce a somewhat lower cost than the Basic Approach. Generally, the directional movement is similar without differences greater than 50bp per annum.
- Strategies 3 to 8 are potentially efficient.
- Based on the qualitative and quantitative analysis Strategies 1 and 2 are not efficient. At best, they provide no benefit, but more likely they increase interest rate risk. They would only decrease interest rate risk if they offset the DRP mismatch risk.
- The submissions reference a broad range of literature that argues there is a negative correlation over time between DRPs and base rates, and the data set used here also produces a negative correlation of -0.44. However, it does not automatically follow that a negative correlation between two variables means that a successful trading (arbitrage) strategy can be generated from that relationship.
- Strategy 1 where a portion of the base interest rate is fixed at a historical trailing average produces a significantly higher transitional starting cost of debt compared to the Basic Approach, or the other financing strategies examined.
- Strategy 2 where a portion of the base interest rate is left floating at a short term variable rate produced a lower transitional starting cost of debt than the Basic Approach, or the other financing practices examined; however, over the life of the transition it has the same expected value as the Basic Approach[5].

Allowed Return on Debt

The key findings are:

- AER's Guideline Allowance method would have over compensated NSPs using any of the strategies other than the trailing fixed rate one for any transition period starting between 2011 and late 2014. Conversely, since the beginning of 2015 it under compensates NSPs using the Basic Approach and at times some of the other strategies. The switch from over compensation to under compensation in 2015 is because the prevailing DRP goes from above the trailing average DRP to below it.
- The relationship between the Guideline Allowance and the Basic Approach has been highly volatile, ranging from +160bp to -30bp. There are a number of reasons for this range. Suffice to acknowledge that each approach is not a proxy for the other.

[4] Note that Strategy 5 begins only in 2013 as it requires DRP data for the 12 years prior, whereas the other strategies only require 10 years of data.

[5] The swap curve at any point in time is the market price of future floating rates. Therefore, the price or expected value of Strategy 2's floating rate is equal to the swaps transacted in the Basic Approach.

1.4.2 Historical Over and Under Compensation

The key findings are:

- Overs and unders existed in the 'on-the-day' regime.
- Overs and unders existed because of two different reasons. Firstly, there was a bias in the measurement, i.e. a systematic mismatch between the actual and allowed components which cannot be expected to offset over time. The expected value of this bias is an over compensation. The second factor of market randomness may or may not offset.
- AER's proposed transitional regime will remove any future randomness in the mismatch.
- Individual BEEs may have experienced extremely different net overs or unders, due to sequencing risk. It has two components, i.e. the rolling timing of a particular BEE's regulatory period and the dollar impact of the mismatch which will be determined by the debt or Regulatory Asset Base (RAB) growth of that particular BEE.
- The history of Australian BBB bond data is inadequate to measure over and under compensation over the life of energy assets[6].

1.4.3 Equity Beta Impact of DRP Risk

The key findings are:

- If the interest rate risk faced by NSPs could be considered as part of general interest rate risk faced by the market, the equity beta measured by AER would have reflected this risk.
- Chairmont contends that the form of interest rate risk applicable to NSPs in the 'on-the-day' regime was not generic interest rate risk applicable to all firms in the economy. Instead it was specific to firms under that regulatory umbrella. Therefore, DRP risk may not be a systematic risk in the sense of the Capital Asset Pricing Model (CAPM).
- The variability of cashflow caused by DRP risk to the industry and an individual NSP should be diversifiable by investors at the market portfolio level across all assets.
- As a consequence of the two previous points, the required return on equity and by definition equity beta should not be affected by the DRP mismatch risk as it appears to be a diversifiable specific risk rather than a component of market systematic risk.

1.4.4 Provider Responses

The key findings are:

- All of the NSPs answered the questions to a large degree with supporting evidence of their debt positions, hedging instruments and costs.
- Regulated firms approach debt and hedging in a variety of ways.
- There is a flexibility in approach rather than following automatic pre-set methods or styles.
- Debt is raised for a variety of terms, anywhere from two years to 30 years, utilising the bank debt market as well as domestic and foreign bond markets.
- Debt raisings are staggered to be no greater than [c-i-c]%, and usually closer to 10%, of total debt in any one year. In some years none was raised.
- While many NSPs fully or largely hedge the base rate to the regulatory period, some carry partial trailing average fixed rate exposure, floating rates or a mixture of the two.
- The company and/or group structure appears to influence an NSP's funding decisions and outcomes, including many having some non-vanilla debt, in particular hybrid or subordinated debt from a parent or group.

[6] References to 'over the life of the assets' means since economic regulation commenced in the late 1990s.

1.5 CONCLUSIONS

1.5.1 EFP and the Allowed Return on Debt

The key conclusions are:

1. AER's Basic Approach to EFP appears to produce a reasonable approximation of the range of the outcomes from various EFPs going into the transition in market circumstances. This still allows firms to outperform slightly by efficient use of flexibility.
2. Negative correlation between base rates and DRPs is not a sufficient condition for strategies 1 and 2 to be effective hedges.
3. The Basic Approach to EFP, i.e. the trailing average DRP plus the average 1-10 year swap rates, minimises any discrepancy between the allowed and actual cost of debt in the transition phase for a BEE, whereas the Guideline Allowance does not.
4. Use of the Guideline Allowance for determinations based on the first half of 2015 may slightly under compensate a BEE, whereas the Basic Approach is likely to be near the top of the range of EFPs[7].

1.5.2 Historical Over and Under Compensation

The key conclusions are:

1. The chance of the random component of mismatches offsetting over time is highly unlikely.
2. There is inadequate reliable historical data to determine whether overs and unders netted out over time for any BEE.
3. Subject to data availability, a separate over and under calculation would be required for each BEE incorporating their regulatory period dates and debt change amount and timing.

1.5.3 Equity Beta Impact of DRP Risk

It is concluded that DRP risk should have had no effect on equity beta, as it appears to be diversifiable specific risk from the viewpoint of a portfolio investor, i.e. compensation to equity holders would have been neither achieved, nor necessary.

1.5.4 Provider Responses

The key conclusions are:

1. Responses provide the required information about the industry, with the possible addition of a few small clarifications in some cases.
2. The providers' financing practices are in most respects in line with AER's assumptions, allowing for efficient deviations, and hence do not require alterations to AER's EFP assumptions.
3. The choice of some providers to create mismatch risk on the base rate may be either inefficient or deliberately speculative for those firms, however for an industry it is common to have some participants take larger risks or make inefficient decisions, i.e. an efficient industry will put pressure on inefficient practices.

[7] Especially when combined with the apparent overstatement of the DRP by the RBA/BVAL measurement technique. Refer Chairmont, Cost of Debt: Transitional Analysis, April 2015, Appendix B

1.6 RECOMMENDATIONS

The recommendations are:

1. AER should continue to use the Basic Approach for its depiction of EFPs for NSPs going into the transitional phase.
2. As a consequence of the above, the allowed return on debt should be calculated in line with the Basic Approach, i.e. a trailing average DRP and the average 1-10 year swap rates.
3. Before adopting Recommendation 2, further examine the other factors likely to cause current and future over or under estimation in the total cost of debt measurement, e.g. apparent overestimation of DRP by the RBA-BVAL measurement technique.
4. AER should not continue with an examination of historical overs and unders as the data is either unreliable or unavailable. There appears no need to compensate equity holders for previous risk in the DRP.
5. In the future AER should consider further enhancements to the EFP assumptions and allowance calculations to more closely reflect provider practices, e.g. use a variable assumed term of issuance to follow developments in the market.

2 BACKGROUND

AER determines a return on debt allowance within the WACC as part of its revenue determinations for NSPs. It has decided to change the measurement approach for the return on debt from an 'on-the-day' to a trailing average approach, and specified transitional arrangements between the two methods. NSPs in Queensland, Victoria, ACT, NT and SA have submitted transitional proposals which are currently being considered by AER.

As the basis for the trailing average measurement and the transition from the 'on-the-day' regime, AER examines debt portfolio management strategies required to be undertaken by a BEE. In recent months, AER has received proposals and submissions from various electricity and gas network service providers. These service providers agree with transitioning to a trailing average, but disagree with the form of transition that AER has adopted.

AER's aim is for the transitional allowance to contribute to the achievement of the allowed rate of return objective by providing a BEE with a reasonable opportunity to recover its efficient financing costs over the life of its assets, taking into account any impact on that from a change in the regulatory regime.

Understanding the benchmark financing practices and cost outcomes of a BEE and any practical differences of providers in the industry plays a key role in determining whether that objective has been and will be met.

3 TERMS OF REFERENCE

3.1 IN SCOPE

In summary, AER seeks:

- Advice on the EFPs of a BEE under the previous 'on-the-day' approach, and therefore what the debt portfolio of a BEE would be at the start of the new regulatory period, along with what EFPs a BEE would adopt under the AER's transition approach.
- Advice on the extent of any under or over recovery of borrowing costs experienced by a BEE in the circumstances of particular service providers under the previous 'on-the-day' approach, and under the AER's transition approach. Equity beta impacts are to be considered.
- A review of information on the actual financing practices and costs of particular service providers, which may inform the answers to the above issues.

3.2 OUT OF SCOPE

A number of matters were outside of scope:

- Consideration of policy level issues.
- Speculation on the rationale of providers' financing strategy practices.
- Quantifying cost of debt performance for alternative EFPs throughout regulatory periods.

4 ALLOWED COST OF DEBT

In the 2013 transitional guidelines to a trailing average from the 'on-the-day' approach, AER specified that the cost of debt allowance for the beginning of the transitional period would be measured as the 10 year BBB+ bond rate as close as possible to the start of the transition period. This report refers to that measure as the Guideline Allowance.

The impact of this approach is that the 'on-the-day' measurement continues for the first rate-set of the transitional period. However, its impact progressively decreases from 100% in the first year down to zero after 10 years.

5 EFFICIENT FINANCING PRACTICES

At the end of the most recent regulatory period, and expecting the application of the AER's transition to the trailing average in the new regulatory period, the AER considers a BEE[8]:

- Would have a staggered debt portfolio with a floating rate exposure.
- Would enter a series of 1 to 10 year floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period.

An underpinning AER assumption is that a BEE has a credit rating of BBB+.

5.1 NO SINGLE EFFICIENT PRACTICE

The industry submits that there is not one unique EFP and this proposition is supported by Chairmont and other expert reports.[9] Importantly, AER also acknowledges that it "does not necessarily consider all efficient service providers would have adopted precisely this strategy".[10]

Any number of possible financing practices can be defined by relaxing the strict assumptions of AER's Basic Approach. However, not all possible financing practices will be efficient. For example, a company faced with uncertainty of financial costs could decide to speculate on financial markets as part of its financing operations. While it can be considered efficient for the company to balance risk and return, outright speculation without a clear link to risk-reducing financial management cannot be considered efficient for a company that is not primarily in the business of trading financial markets.

This report seeks to examine various alternative financing practices suggested by NSPs, or common to corporate treasuries, and determine their impact on the actual cost of debt and any discrepancy to AERs allowed cost of debt. The question of whether or not those possible financing practices were indeed EFPs is also considered.

5.2 AER BASIC APPROACH[11]

The AER considers an efficient financing practice of a BEE under the 'on-the-day' approach would have been to borrow long term and stagger the borrowing so only a small proportion of the debt matured each year. Furthermore, AER considers a BEE would have combined this practice with interest rate swap contracts to broadly match the base rate component of its actual return on debt to its return on debt allowance. Specifically, AER considers an efficient financing practice would have been to:

- Borrow long term (10 year) debt and stagger the borrowing so only a small proportion (around 10 per cent) of the debt matured each year; or
- Borrow using floating rate debt, or borrow fixed rate debt and convert it to floating rate debt using fixed-to-floating interest rate swaps at the time of the debt issue, which extended for the term of the debt (10 years); or
- Enter into floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period, which extended for the term of the access arrangement period (typically five years).

[8] Refer Appendix A
[9] Chairmont, Cost of Debt: Transitional Analysis, April 2015 p.26
[10] Refer Appendix A
[11] Refer Appendix A

5.3 FINANCING FACTORS AND DECISION VARIABLES

Diagram 2 in Section 1.3.2 displayed the interaction between internal and external factors with the decision variables available to regulated NSPs. These are detailed below.

5.3.1 Internal Factors

The internal factors impacting the financing strategies may be broadly categorised under the following headings:

Debt Rating

A variation to the AER Basic Approach is that not all debt issuances are rated BBB+ regardless of the company's senior debt rating. A company may issue debt of higher or lower credit quality, whether rated or not, using different deal structures. Debt with lower credit quality may include preference shares, convertibles and subordinated debt; whereas, debt with a higher rating may include credit enhancements such as a guarantee or asset-backing.

Strategic Decisions

The AER Basic Approach does not take into account the treasury risk and financing strategic decision making process. This process will include gathering internal company information that will impact on the overall financing and hedging approach. These factors include possible takeovers, changes to group funding practices and considering the impact of external factor changes.

Group Structure

The group structure and capital, asset and liability management across the group will impact on financing strategies.

Market Expectations

Financing decisions will in part be influenced by market expectations, e.g. interest rate forecasts.

5.3.2 External Factors

AER's Basic Approach to EFP is interpreted as an automatic and fixed procedure which does not change over time. Whether or not AER views it that way is not debated here. At any point in time, external factors beyond the control of the NSPs will have an influence on the ability and choices NSPs have for practically implementing an EFP. The starkest example in recent years was the extreme Global Financial Crisis (GFC) turbulence in 2008-09.

Market Prices

Market prices are continually changing, resulting in different opportunities and relativities between strategies. A recent key factor that has impacted interest rates globally is Quantitative Easing (QE). For the period 2011 to 2015 the US Federal Reserve, European Central Bank, Bank of Japan and Bank of England have all engaged in QE. The Chinese economy with its peg to the US dollar was an indirect beneficiary of the Federal Reserve's aggressive market intervention.

This global central bank intervention is unprecedented (QE for the first time in US history). It is impacting bond prices and suppressing volatility as the central banks buy securities at different maturity dates and different credit qualities across the yield curve. A desired outcome for those economies using QE is currency devaluation.

Liquidity
Regularly, there are times of above and below average liquidity in various debt and hedging markets, as well as equity and commodity markets. These present opportunities and constraints to the preferred financing practices of companies, however they need to adjust to them.

The Basic Approach assumes all debt is always issued as 10 year debt. For at least two years during the GFC there was minimal demand for long term BBB paper.

Products
Available products continue to evolve as financial markets become more sophisticated, providing new possibilities for debt raising and hedging, thereby giving rise to different EFPs.

Regulation
There is a natural tension between the objectives of the regulator and the service provider. Consequently, regulation will influence behaviour.

5.3.3 Decision Variables

The elements that can be varied in EFPs to create a different outcome to AER's Basic Approach are:

- Term. The borrowing is greater or less than 10 years.
- Percentage Issued Annually. This is greater or less than 10% per annum.
- Effectively Borrow Fixed. This can be done by either issuing fixed, or issuing floating and swapping to fixed at the same time.
- Regulatory Swap. This may be undertaken for less than 100% of the total debt.

Term
NSPs have been observed to raise debt funding for terms of less than and greater than 10 years. Their names arise regularly in lists of debt raising from the syndicated loan market that primarily organises cash loans for terms of three to five years. Examination of bond issuance data from public and private markets also reveals the NSPs have issued anything from five year to 15 year bonds, and occasionally even longer term.

Decisions about the term of debt raising are based on balancing three primary concerns for a company – refinancing risk, cost minimisation and interest rate risk.[12] An NSP could plausibly decide that they would follow a strategy of always raising debt for terms up to and including 10 years, in order to benefit from lower credit spread for short term debt, or if they have better funding opportunities from the bank debt market than the bond market. Alternatively, other NSPs may implement a policy of always securing funding for longer terms than 10 years when possible in order to avoid having to refinance as often. Companies could also alter the average term of debt over time, reacting opportunistically to changes in market circumstances. This could include borrowing for terms beyond 10 years when DRPs are particularly low or borrowing for short terms when there are low levels of bond market liquidity. Blended strategies of any of the above are also possible.

[12] For greater explanation Refer Chairmont, Cost of Debt; Transitional Analysis, April 2015, p.26-28

Percentage Issued Annually

Efficient companies will not blindly adhere to automatic policies, such as re-issuing only 10% of their debt each year, in the face of changes in market circumstances. Depending on the level of DRP, expectations about future market conditions, and changes in investor demand or lender capacity, an NSP is likely to respond by raising more of their debt at times deemed to be favourable and waiting through unfavourable periods, where possible. Typically decisions about variations to an evenly staggered debt profile are reactive rather than following a static long term plan.

NSP responses to AER's information requests reveal that many of the them did as described above, i.e. they only re-financed during the peak of the GFC if they had to; whereas, others waited as long as financially possible after the GFC before issuing debt. This strategy is an EFP.

Effectively Borrow Fixed

Some NSPs have argued that it is appropriate for them to leave some of their debt issued in fixed rate and not swap to floating rate at the time of issue. When an NSP does this, it then only needs to do pay-fixed swaps for the remaining floating portion of total debt, i.e. <100% of total debt to match the regulatory period (addressed individually in the point below – Regulatory Swap). This effectively gives them part of their portfolio cost at a trailing average of the base (swap) rate, as well as a trailing average of the DRP.

By doing this they are creating a mismatch in the timing of base (swap) rate fixing in their costs compared to the base (swap) rate fixing in their revenues, as per AER's allowed cost of debt. This would not be efficient if a NSP's primary risk management objective is to align revenues and costs and there are no offsetting risks. The unique position of NSPs receiving an allowance for their interest costs, i.e. making it akin to a revenue item, heightens the importance.

The availability of interest rate swaps in all but the most exceptional market circumstances means that an NSP could very closely match those two base rates. Instead some argue that it is more efficient to stagger the base rate fixings to deliberately create a mismatch.

Their stated purpose of the base rate mismatch is as a hedge for the mismatch in DRP which was unavoidable under the 'on-the-day' approach. Section 5.7 below examines whether this strategy is efficient. Regardless of its efficiency, it is examined as part of the quantitative analysis as some in the industry have strongly argued for it.

Regulatory Swap

The regulatory swap variable may be actioned on its own, even when all debt is issued at effectively floating rates.

This variation could be implemented by NSPs hedging less than 100% of their total debt using pay-fixed swaps to match the regulatory period. This would leave them with some debt at variable short term interest rates, i.e. usually BBSW 3 month and/or 6 month, thereby creating a mismatch between revenues and costs.

This time the mismatch is different to the fixed rate borrowing strategy, as here it is between variable short term rates over the regulatory period and the (implied) 5-year swap rate set by AER at the start of the period in the 'on-the-day' regime. Again the purpose is to hedge the mismatch in DRP which was unavoidable under the 'on-the-day' approach. Section 5.7 below examines whether this strategy is efficient. It too regardless of its efficiency is examined as part of the quantitative analysis as it has been strongly argued for by some in the industry.

5.4 FINANCING STRATEGIES

This section explores other financing strategies that may be used and compares them to the AER Basic Approach.

Each section below contains a description of the financing strategy, the rationale for adopting it and the quantitative analysis. The reason for the quantitative exercise is to establish a range of cost of debt EFPs. To do this, the analysis considered multiple time periods, as the size of the range and relative ranking of different strategies change over time.

The measurement outcome is the actual cost of debt in the first year of the transitional period. To provide greater insight into the possible outcomes given different market circumstances the measurement period begins in 2011, although it is well before the regulatory change was specified.

Diagram 3 is for illustrative purposes only, i.e. it is not based on any quantitative analysis. It shows hypothetically how different financing strategies can be impacted over time. For example, the trailing fixed strategy is initially seen to be at the top of the range and above the AER Basic Approach in the first period measured. It later becomes less expensive, and moves to become one of the cheapest financing strategies before moving again up the list.

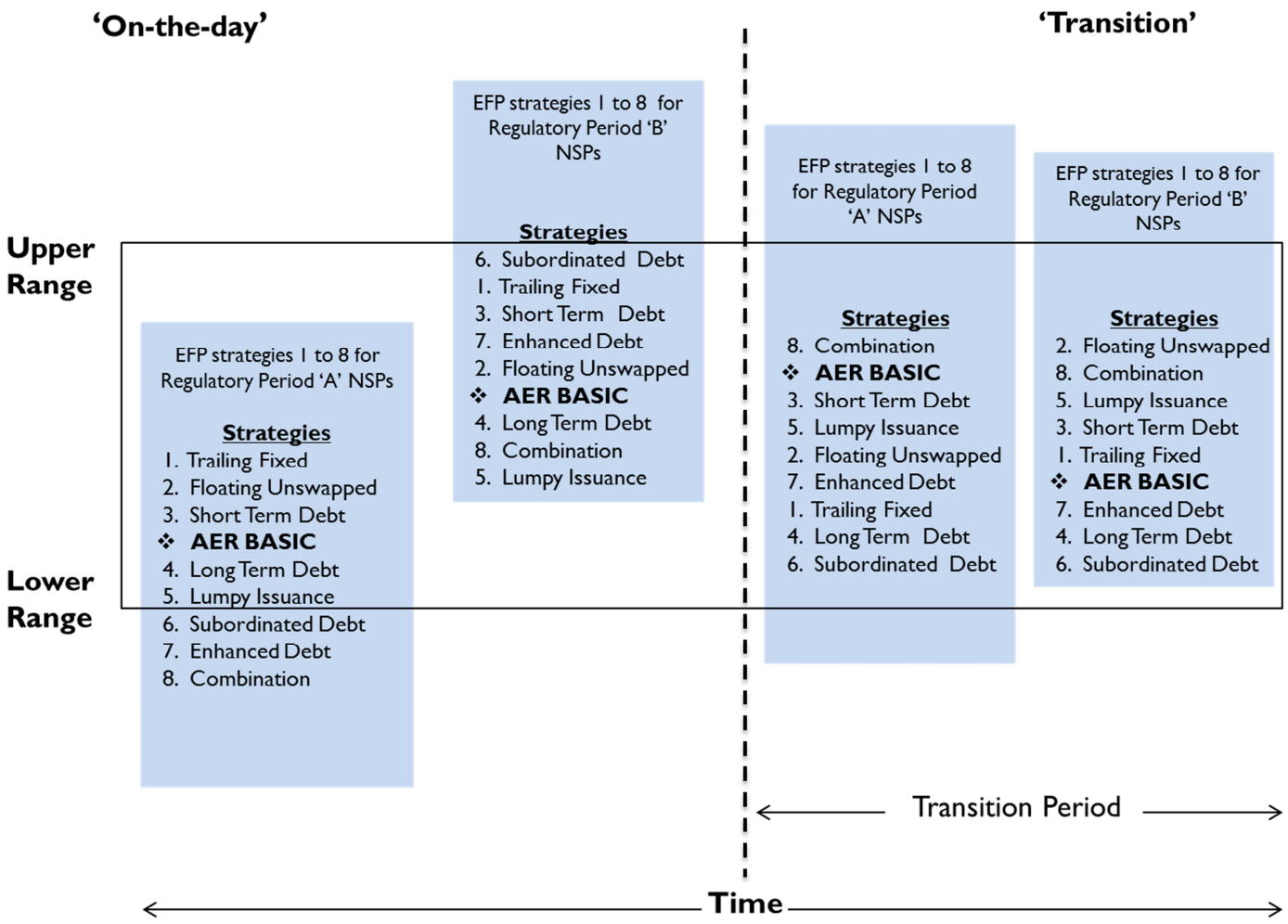


Diagram 3: Alternative Strategies Over Time

Diagram 3 illustrates possible outcomes. In this section the quantitative analysis is undertaken that shows the actual outcomes. With respect to the quantitative analysis there are a few important points that must be acknowledged. These are:

- The limited history of DRP data only going back to 2001 means that the first measurable 10 year trailing average is for 2011.
- End of month rates are used.
- Trailing average DRPs are measured as averages of the monthly data.

5.4.1 Strategy 1: Trailing Fixed

Description
NSPs issue some proportion of their debt each year as fixed rate debt, or issue floating and swap to fixed at the time of issue. This gives a trailing average fixed rate component to the firm's cost of debt, along with the trailing average DRP as assumed in the Basic Approach. Accordingly, x% of the portfolio will already be in fixed rate at the time of a new regulatory period, so the firm only needs to undertake pay-fixed swaps to match the regulatory period for 1-x% of the total debt. All other elements of the Basic Approach remain the same.

Rationale
A number of NSPs, supported by analysis from CEG that referenced wider academic literature, claim this strategy provides a partial hedge, i.e. offsets the DRP mismatch risk which they face over time.[13] It is based on a series of studies that suggest there is a negative correlation between DRPs and base interest rates.

In Section 5.7 below we examine the efficiency of this strategy as a specific hedge to the DRP risk faced by Australian regulated energy networks in the 'on-the-day' rate setting regime over the past 10-15 years.

Quantitative Analysis
As shown in Graph 1, for all the starting points from 2011 until now the results show for a hedge ratio of 50% Strategy 1 was:

- Always more expensive than AER's Basic Approach, ranging from 75bp to 180bp higher.
- Always the highest cost of all strategies considered here.
- Above the Guideline Allowance most of the time.
- Further away from the Guideline than all other strategies most of the time and was on average the worst hedge.

5.4.2 Strategy 2: Floating Unswapped

Description
NSPs leave y% of their debt with a floating base rate, rather than using a pay-fixed swap at the start of the regulatory period for the total debt amount. This means their total interest rate cost will depend in part on the average BBSW three or six month rate as it changes over time, rather than having the fixed swap rate at the start of the period determine all of their base rate cost.

[13] CEG, Efficient use of interest rate swaps to manage interest rate risk, June 2015

Rationale

As for Strategy 1, a firm could justify using this strategy in the attempt to hedge the DRP mismatch risk which they face. If the floating rate moves in the opposite direction in a stable relationship to the DRP, this strategy is intended to reduce the mismatch risk of the total cost of debt.

In Section 5.7 below we examine the efficiency of this strategy as a specific hedge to the DRP risk faced by Australian regulated energy networks in the 'on-the-day' rate setting regime over the past 10-15 years.

Quantitative Analysis

At the end of the previous regulatory period, this strategy positions the fixed/floating debt portfolio the same as the Basic Approach. The difference occurs near the start of the new regulatory period where the Basic Approach locks in pay-fixed swaps for the new regulatory period, whereas Strategy 2 leaves the base rate floating at BBSW. Accordingly, the carrying cost of the debt portfolio going into the first year of a new period will differ to the Basic Approach to the extent that the short term BBSW rate is different to the swap rates. This can be seen in Graph 1 where 100% is left as floating.[14]

For transitions starting in 2011-2015 this strategy gives a first year cost of debt lower than the Basic Approach resulting from the 1-year swap rate being lower than the average 1-10 year swap rates.

Despite beginning at a lower rate, Strategy 2 may or may not be lower cost over the entire transition, depending on the path of short term rates over the ensuing years.

If an appropriate allowance was to be calculated on the basis of this strategy, the result would be the same as the Basic Approach. This follows because the market price for the short term BBSW levels over the coming years is expressed by and equal to the swap rate. Therefore, adopting Strategy 2 would not require a different calculation for the cost of debt allowance going into the transition to the trailing average regime, or even at the roll-over to a new period maintaining the 'on-the-day' approach.

5.4.3 Strategy 3: Short Term Debt

Description

NSPs raise m% of debt as 3-year debt and n% of debt with a 5-year term. The remainder is issued as 10-year debt. In this simple automatic version of the strategy, the same proportions of 3, 5 and 10 year debt, respectively, are raised each year, i.e. 1/3 of the total 3-year debt, 1/5 of the total 5-year debt and 1/10 of the total 10-year debt.

Rationale

As outlined in our discussion of EFP in our April paper[15], there are many efficient variations of debt portfolio management apart from the Basic Approach. In particular, it is reasonable for a firm to raise debt for a number of terms and to vary that over time, as market conditions change and bank credit market opportunities arise.

[14] A 100% ratio is used in the modelling to emphasise the impact of the strategy. A lower ratio would proportionally move Strategy 2's line closer to the Basic Approach, i.e. a ratio of 50% would be half way towards it.

[15] Chairmont, Cost of Debt Transitional Analysis, April 2015, p. 26

The benefits of shorter term debt include that DRPs are usually lower than longer term DRPs at the same time and that it diversifies funding sources for the NSP. The latter particularly refers to bilateral or syndicated bank lending which is typically in the three to five year area and not the same investor base as relevant for 10-year bond issuance.

Quantitative Analysis
Graph 1 shows that during 2011 to 2015, this strategy sometimes produced lower and other times higher carrying costs of the debt portfolio at the start of a transition. The ratios used in this example are 25% of debt raised for each of three and five years, with the remaining 50% as 10 year term. The difference compared to the Basic Approach varied from approximately 20bp higher in 2011 to 30bp lower in 2015.

5.4.4 Strategy 4: Long Term Debt

Description
NSPs issue debt with maturities beyond 10 years, whenever the market allows. In the example, it is assumed that debt with a 15 year term was issued in the years 2003-07 and 2012-14. It is well documented that the GFC period and its immediate aftermath did not allow much, if any, issuance of BBB long term debt.

In years where long term issuance was not available, i.e. 2008-2011, 10 year debt was issued. It was necessary to also vary the 10% per annum rule of the AER Basic Approach for those years where 100% debt remained outstanding. This arose because the 15 year debt had not matured, whereas a 10 year debt would have matured.

Rationale
As for Strategy 3, this strategy is efficient to capture a different investor base, especially in foreign markets where some investors such as pension funds and insurers prefer longer term assets. It also reduces the cost of more regular refinancing and reduces the refinancing risk of approaching the market as often.

Quantitative Analysis
As depicted in Graph 1, Strategy 4 in 2011 produced a slightly higher cost of debt, i.e. 5bps, than the Basic Approach, before switching to a cost advantage through to 2015 to be 35bp lower. For longer time periods this strategy can shift to be a higher or lower cost strategy depending on market circumstances.

5.4.5 Strategy 5: Lumpy Issuance

Description
The variation to the Basic Approach embodied by this strategy is that NSPs issue more than 10% of total debt in years when conditions are considered favourable, or the standard 10% if not. The specific example modelled here is to issue 20% in years when the prevailing DRP is lower than the three year trailing average of the DRP. There will be years when none is issued, as no more than 100% of total debt can be outstanding at any point in time.

Rationale
It can be efficient to issue more debt when DRPs are seemingly low and in order to reduce re-financing risk in case of future illiquidity. Sometimes more debt is issued to satisfy current investor

demand and to establish your name with institutional investors, as this may assist in the future when liquidity is tight.

Quantitative Analysis
As the trigger to issue more debt is the three year trailing average, a longer historical data set is required compared to the other strategies. As our historical data set is limited to start in 2001, Graph 1 shows this strategy only begins to produce results in 2013 as opposed to 2011 for the other strategies. Since then this strategy was continually lower cost than the Basic Approach, but by a decreasing margin. It began at 50bp lower in 2013 which reduced to 15bp in early 2015. The lower cost resulted from large issuance being triggered in the declining DRP years of 2004-06 compared to the high DRP years' post-GFC. This result is unlikely to be the case in all market circumstances.

5.4.6 Strategy 6: Subordinated Debt

Description
An NSP could issue some of its debt requirement as subordinated or in some other way equity-hybrid form of debt. The possible forms of such issues are many, including but not limited to:

- Simple subordinated debt, ranking immediately behind senior debt in the result of a credit event, but in other ways equivalent to a vanilla bond.
- Hybrid equity such as a convertible or extendable bond.
- Preference shares.

Rationale
This diversification to a capital structure can be efficient for many reasons including:

- Enhancing the credit worthiness and rating of the senior debt.
- Providing a more cost effective equity-like component.
- Optimising tax.

Quantitative Analysis
All forms of subordinated or hybrid debt will attract a higher interest rate, or DRP, than an equivalent vanilla senior debt raising. Measuring a firm's cost of debt including such issues would give a result above the Basic Approach, but depends very much on the exact form of the subordination and conditions of the issue. Hence, no attempt has been made to quantify the cost and it would blur the overall cost of debt benchmarking, as it would affect the cost of equity and potentially the gearing ratio and beta.

Despite the higher cost, this strategy can be used efficiently and does not require a different treatment for measuring the cost of debt allowance. This strategy is part of the portfolio optimisation an NSP can undertake to outperform the standard WACC benchmark, if they see the opportunity.

5.4.7 Strategy 7: Enhanced Debt

Description
As for Strategy 6; however with credit enhancement features, e.g. guarantee, credit wrap or asset-backed securities that improve on the NSP's normal credit rating.

Rationale
Aims of this strategy include:

- Reducing the cost of debt even after taking into account the cost of the enhancement feature, e.g. a wrap or guarantee fee.
- Providing liquidity advantages of tapping into a different investor base.
- Gaining value from under-valued or under-utilised assets.
- Optimising tax.

Quantitative Analysis
No analysis was undertaken as for Strategy 6.

5.4.8 Combined Strategies

Description
All of the above strategies may be combined in various ways producing a range of results. For example, responses from the NSPs indicate that Strategies 1, 3 and 4 are commonly adopted together, although to varying degrees between companies.

Rationale
It was noted earlier that by definition, alternative strategies which are efficient will sometimes produce lower cost and other times higher cost. The relativities and quantitative differences will vary over time with market circumstances. By adopting partial versions of a number of strategy variations, an NSP is diversifying to mitigate any strong effect of a particular market occurrence. Combining efficient strategies will likely be efficient and the mix will change in reaction to internal and external factors.

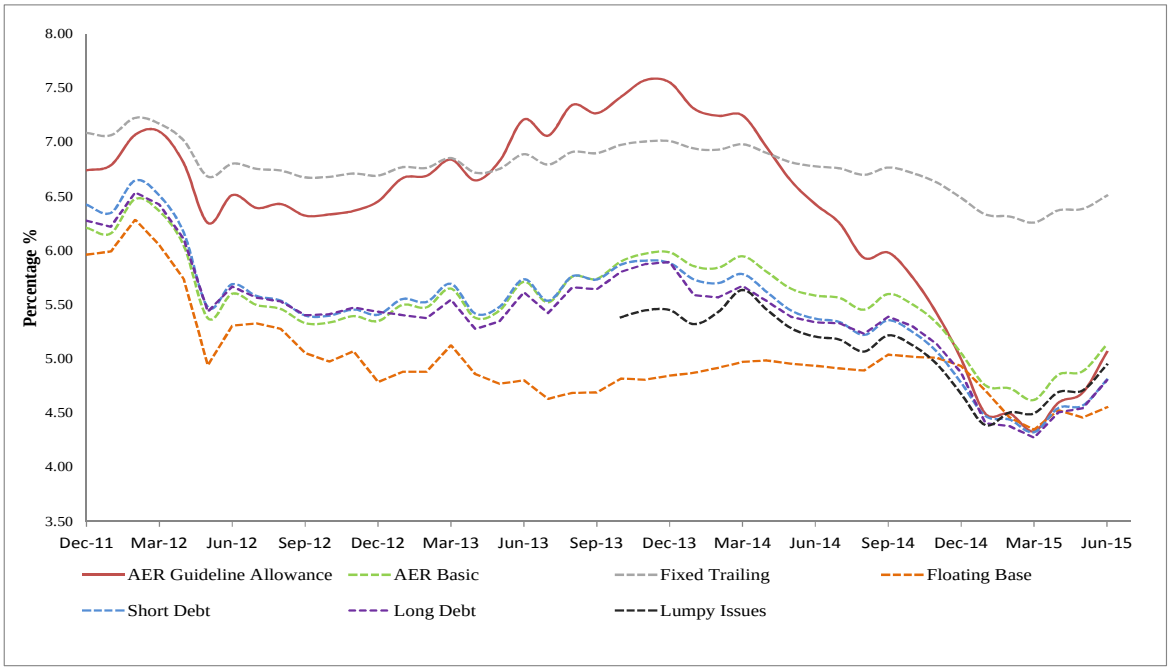
Quantitative Analysis
Partial application of the various strategies will produce a corresponding blend of cost variances. To the extent one strategy produces a higher cost at the same time as another strategy produces lower cost, the overall cost of debt can be stabilised. The manner in which strategies move in relation to each other varies which means NSPs cannot be certain whether the strategies will offset each other. The more complex the strategies the greater the difficulty in predicting an outcome.

Another reason for adopting multiple strategy variations is to attempt to capture as much benefit of cost-reduction strategies as possible. A classic policy of companies is to combine lumpy long term issuance in favourable markets with ongoing short term issues to capture the DRP slope advantage.

A wide range of numbers could be calculated depending on the period taken and the exact strategy combination. This is not taken further in this report, as quantification of the 'pure' strategies gives a better impression of which possibilities and potential results exist. Combinations can be left to the discretion of individual NSPs seeking to make superior decisions within that range.

5.5 SUMMARY OF QUANTITATIVE RESULTS

Graphical comparison of the above strategies reveals a number of key highlights.



Graph 1: Point in Time Analysis - Cost of Debt at Transition Commencement

Graph 1 displays the rate for the debt portfolio in the first year of the transition period. The lines represent the relativities between strategies for each different point in time. For example, the date of December 2011 shows the calculated cost of debt or allowance which would occur for a hypothetical transition period commencing in December 2011. The lines do not represent an ongoing cost for a single NSP.

Note that Strategy 5 begins only in 2013 as it requires DRP data for the 12 years prior, whereas the other strategies only require 10 years of data.

5.5.1 Financing Strategies

The results are:

- There are major variances in the initial cost of the transitioning debt portfolio for minor differences in the starting time.
- The cost difference between various debt management strategies also changes significantly within a short time.
- Strategy 1 is the highest cost outcome by a significant margin and the size of the gap has substantially increased in the past year.
- Strategy 2 has consistently produced a lower starting rate when the swap yield curve is positively sloped, however over the life of the transition has an expected value equal to the Basic Approach[16].

[16] The swap curve at any point in time is the market price of future floating rates. Therefore, the price or expected value of Strategy 2's floating rate is equal to the swaps transacted in the Basic Approach.

- Many of the strategies recently have produced a lower cost than the Basic Approach. Furthermore, these strategies move directionally with the Basic Approach and the difference remains within 50bppa. This is in contrast to Strategy 1 that is out of step with the market.

5.5.2 Allowed Cost of Debt

The results are:

- AER's Guideline Allowance method would have over compensated NSPs using any of the strategies other than the trailing fixed rate one for any transition period starting between 2011 and late 2014. Conversely, since the beginning of 2015 it under compensates NSPs using the Basic Approach and at times some of the other strategies.[17] The switch from over to under compensation in 2015 is because the prevailing DRP goes from above the trailing average DRP to below it.
- The relationship between the Guideline Allowance and the Basic Approach has been highly volatile, ranging from +160bp to -30bp. This highlights the very different components of the two measurements.
- The gap between AER's Guideline Allowance and the average of EFPs has gone from approximately 175bp positive in the market circumstances of late 2013 to an average of 3bp negative in the first half of 2015.

5.6 Comparative Analysis

AER's Basic Approach is within a reasonable range for various EFPs which NSPs could adopt, except for Strategy 1. Graph 1 shows that Strategy 1 has been more expensive for a long period of time which indicates that it may be flawed.

In 2015, it appears that the alternative strategies would give a slightly lower cost of debt than the Basic Approach, but earlier market conditions gave rise to some of them being somewhat above the Basic Approach.

Even though Strategy 2 appears to be a superior strategy over the period, this could be misleading, because Graph 1 only shows the cost in the first year going into transition. Specifically, Strategy 2 relies on short term rates that have been lower than longer term swap rates. This strategy does capture the lower rate in the first year of transition; however it leaves itself completely open to future movements in short term rates. From a risk management perspective the benefit of the lower initial rate is countered by the open risk to potential rate increases over the remaining 10 years of transition.

This comparison indicates that the Basic Approach appears a reasonable way to measure the upper range of the carrying cost of an NSP's debt portfolio.

5.7 Examining the Efficiency of Strategies 1&2

This section examines the proposition that Strategies 1 and 2 are efficient. The proposition is that these strategies offset the DRP mismatch risk under the 'on-the-day' regulatory approach, because these strategies assume there is a negative correlation between the base rate and DRP, and this acts as a hedge. Each strategy applies the negative correlation argument, as follows:

- Strategy 1 is based on a negative correlation between 10 year swap rates and the DRP.

[17] Ignoring for now the apparent overestimation of DRP by the RBA-BVAL measurement technique cited in Chairmont, Cost of debt transitional analysis, April 2015, Appendix B

- Strategy 2 is based on a negative correlation between short term floating rates and the DRP.

Regardless of the outcome of this analysis it is possible to fully neutralise the swap component of the 'on-the-day' allowance by transacting pay-fixed swaps in line with the regulatory period for fixing, as suggested in the Basic Approach. Adopting this approach means that neutralising the base rate risk is possible, therefore Strategies 1 and 2 are not necessary. The only efficient reason for adopting either Strategy 1 or 2 is if they offset the DRP mismatch risk.

As the focus of this report is primarily about carrying costs of different financing practices at the start of the transition, Strategy 1 has greater relevance than Strategy 2. Nonetheless, there is a brief section below which examines the efficiency of Strategy 2 as it also relies on the negative correlation argument and could become relevant in discussions of historical over or under compensation.

5.7.1 Premise of the Strategies

The reason for considering the approach is due to a well-documented negative correlation between DRPs and base interest rates.[18] The data used for quantitative results in this report corroborates the idea of negative correlation, in this case revealing a negative correlation of -0.44.[19] The hypothesis is that by introducing mismatched base rates to the portfolio, a company will be able to at least partially offset potentially damaging DRP mismatch risk. Simply, if DRPs rise they can cause the actual cost of debt to outstrip the allowed cost of debt. If the base rates remain partially unhedged, any downward movement in base rates will reduce the total cost and correspondingly offset the increase in cost caused by the DRP rise.

The question to be answered here is whether there is sufficient evidence that the observed negative correlation leads to a practical hedge strategy to achieve that offset.

5.7.2 DRP Risk to be Offset

To hedge a risk, the exact risk needs to be specified. It is the difference between the implied DRP in the allowed return and the DRP actually paid by the BEE under EFP. The discrepancy was built in to the 'on-the-day' approach because a BEE had to maintain a staggered debt portfolio, incurring an average DRP cost across time, whereas its revenue was based on the DRP in the short window before the beginning of each regulatory period.

The difference between the revenue and cost in a particular regulatory period was:

	Year 1	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Revenue:	DRP_{10}^{0}	DRP_{10}^{0}	DRP_{10}^{0}	DRP_{10}^{0}	DRP_{10}^{0}
Cost:	$\frac{\sum_{t-9}^{0} DRP_{10}^{t}}{10}$	$\frac{\sum_{t-8}^{1} DRP_{10}^{t}}{10}$	$\frac{\sum_{t-7}^{2} DRP_{10}^{t}}{10}$	$\frac{\sum_{t-6}^{3} DRP_{10}^{t}}{10}$	$\frac{\sum_{t-5}^{4} DRP_{10}^{t}}{10}$

Where time zero is the start of that regulatory period and DRP_{10}^{0} is the DRP of the 10-year bond measured at time zero. The cost formula represents the 10 year trailing average of the DRP. Each year the formula shows the trailing average calculated at the start of that year.

[18] For a list of empirical literature Refer CEG, Efficient use of interest rate swaps to manage interest rate risk, June 2015, Appendix B

[19] The negative correlation is between monthly changes in 10-year DRPs and 10-year swaps from December 2001 to July 2015.

Strategy 1 suggests hedging this risk by introducing the following mismatch, i.e. the difference between the revenue and costs as shown below. To clarify, the strategy adds the mismatch from the equations below to the mismatch from the equations above. To be risk reducing the result of the swap equation below must be positive when the result of the DRP equation above is negative, and vice versa. The revenue represents the base rate component of the allowance fixed at the beginning of the regulatory period. The cost formula represents the 10 year trailing average of the fixed base rate (swap rate). Each year the formula shows the trailing average calculated at the start of that year.

Revenue:	$x\% \times S_{10}^{0}$	$x\% \times S_{10}^{0}$	$x\% \times S_{10}^{0}$	$x\% \times S_{10}^{0}$	$x\% \times S_{10}^{0}$
Cost:	$x\% \times \frac{\sum_{t-9}^{0} S_{10}^{t}}{10}$	$x\% \times \frac{\sum_{t-8}^{1} S_{10}^{t}}{10}$	$x\% \times \frac{\sum_{t-7}^{2} S_{10}^{t}}{10}$	$x\% \times \frac{\sum_{t-6}^{3} S_{10}^{t}}{10}$	$x\% \times \frac{\sum_{t-5}^{4} S_{10}^{t}}{10}$

Where S_{10}^{0} is the 10-year swap rate measured at time zero and $x\%$ is the hedge ratio to be issued in fixed rate.

This shows that in line with the premise of the strategy the hedge will exactly offset the risk, if the 10-year swap rate and the 10-year DRP change in the:

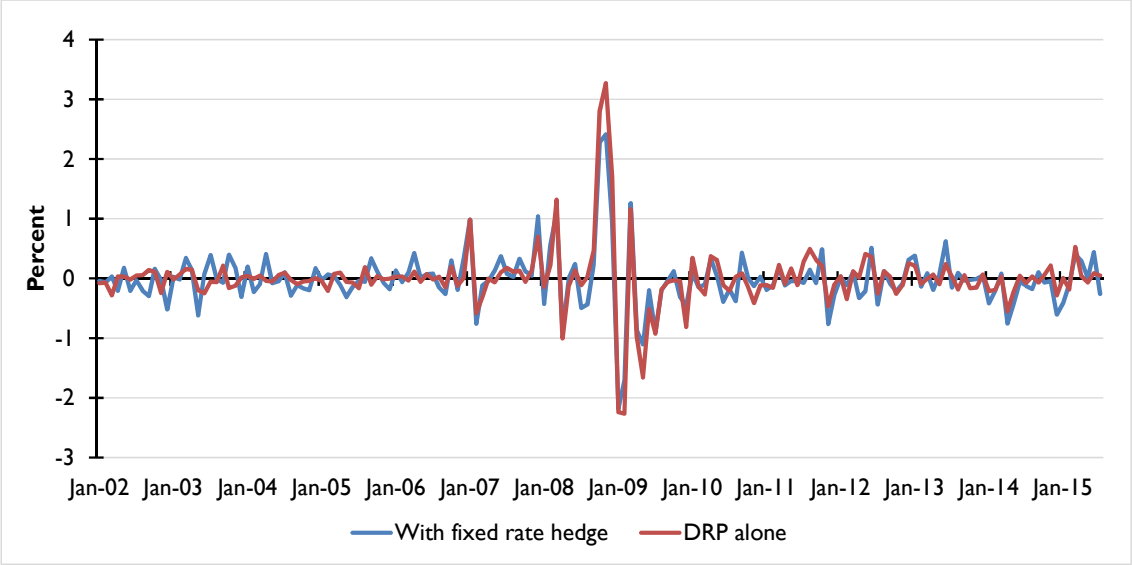
- opposite direction
- same year
- stable relationship of $\frac{1}{x}$.

Even if these requirements hold partially, the hedge may be effective in reducing overall interest cost mismatch.

5.7.3 Stability of Counterbalancing Movements

To examine any benefit from offsetting swap and DRP movements, data for a hedge strategy is produced by adding the change in the prevailing 10-year DRP to the change in the prevailing 10-year swap rate. If the swap rate goes down by the same amount as the DRP goes up in any month, the hedge strategy here will give a result of zero. Graph 2 compares the monthly change of the DRP compared to the monthly change in the hedge strategy, assuming a hedge ratio of 100%, i.e. using all trailing average fixed rate debt[20].

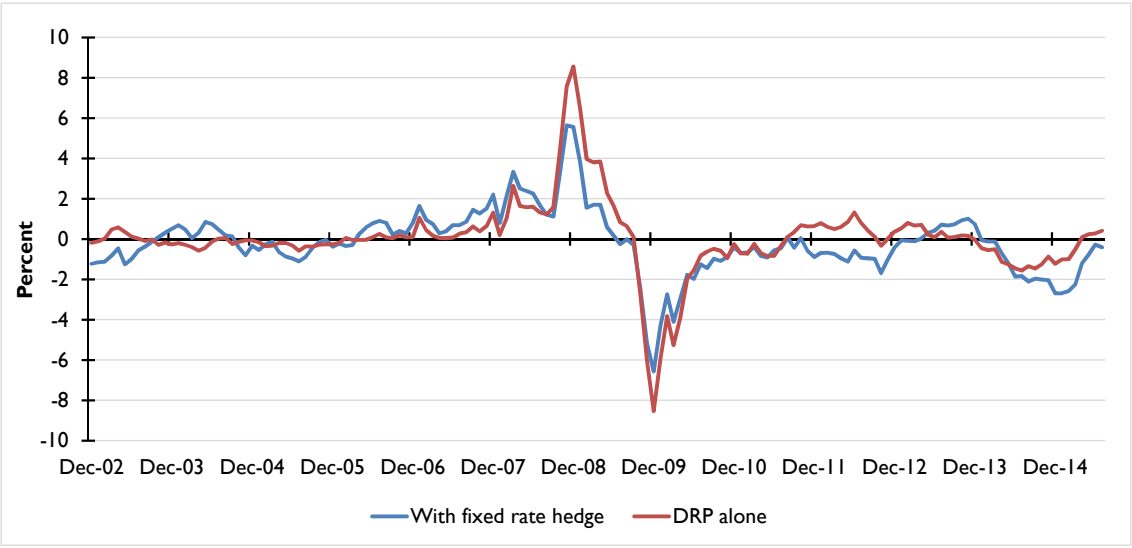
[20] 100% is used here to make the difference between the two risks clear. A lower ratio makes the difference smaller yet causes the same directional results.



Graph 2: Monthly Cost Changes of DRP versus Fixed Rate Hedge Strategy

Graph 2 indicates that there is no clear reduction in monthly volatility of costs by introducing a swap variability to a DRP variability. There is some volatility offset in the most extreme months of the GFC and the immediate aftermath, but in many periods, especially pre-GFC, combining swap risk with DRP risk increased overall volatility of cost rather than decreasing it. This analysis suggests there is no hedge effect by opening a swap rate risk.

The next step is to examine the longer term relationship of DRP to swap.



Graph 3: Annual Cost Changes of DRP versus Fixed Rate Hedge Strategy

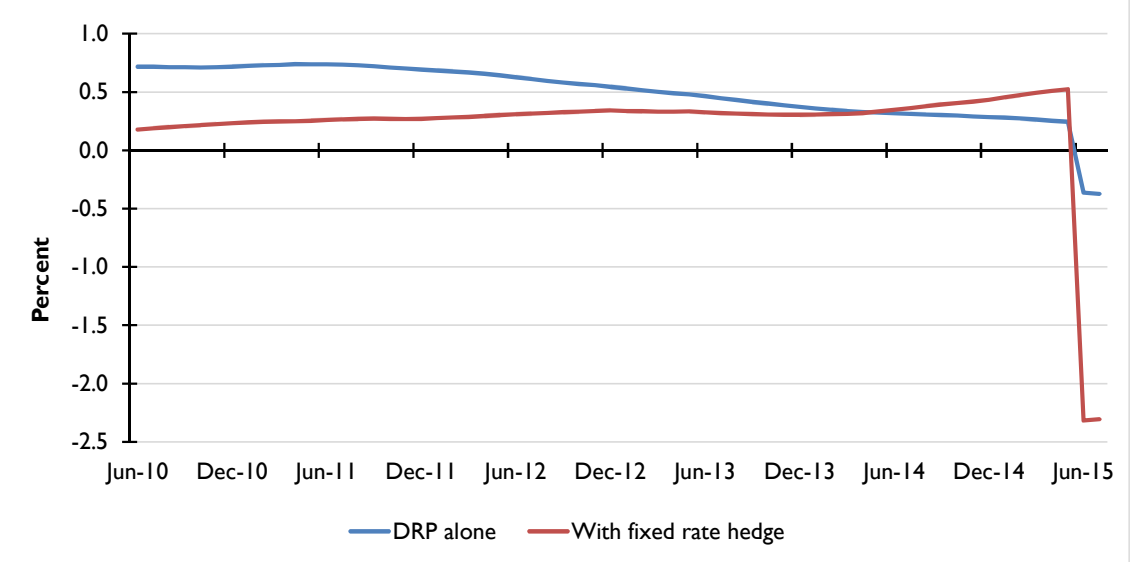
Graph 3 emphasises the smaller changes of the hedge strategy around the GFC, although it also adds to the impression that as a hedge strategy over the longer term, it is not effective. Sometimes, it produces a less volatile result while other times it increases volatility. Over the whole period the standard deviation of the annual DRP change alone is 1.86, whereas the standard deviation of the hedge strategy is 1.59. However, if the 18 months around the GFC are excluded from the analysis,

the standard deviation of the remaining 13 years was 0.79 for the DRP alone and 1.09 for the hedge strategy. The inference from the data is that in times of extreme DRP moves, swap rates can act as an offsetting force, however generally the combination worsens interest rate risk rather than reduces it.

5.7.4 Results of Using the Strategy

In Section 5.5, the comparison of financing strategies showed that including a trailing fixed rate strategy deviated the most from the cost of debt allowance methodology and all other financing strategies. A hedge strategy which performs so poorly for so long suggests it is not a robust strategy.

Another way to examine the performance of the strategy is to measure its performance over past regulatory periods; however given the limited history of reliable Australian BBB bond yield data only one period can be measured. The results are revealed in Graph 4.



Graph 4: Running Mismatch in Total Debt Cost

Graph 4 shows the difference between the allowed cost of debt and the actual cost of debt, either using the Basic Approach EFP or Strategy 1.[21] Leaving debt at trailing fixed rates allowed a lower mismatch at the beginning of the previous regulatory period, but that mismatch grew with the hedge; whereas without the hedge it reduced up until the new rate-set in June 2015. The dramatic change in the mismatch occurs when the new regulatory allowance is set in June 2015. The strong windfall loss beginning to be realised in June and July 2015 arises from the new swap rate-set being much lower than the trailing average swap rate. A sharp move of this magnitude demonstrates the risk-increasing nature of Strategy 1.

5.7.5 Conclusions - Strategy 1

At this point in time the evidence does not support the notion that Strategy 1 is efficient. It creates an additional and avoidable interest rate risk in the base component which has an unstable and

[21] A 100% hedge ratio is illustrated. Use of a 50% ratio as in the earlier sections for Strategy 1 would move the two lines in the graph closer together, however 100% is used here to clearly show the significant risk increase which can occur from this strategy.

unreliable relationship to the DRP mismatch risk. The submissions reference a broad range of literature that argue there is a negative correlation over time between DRPs and base rates, and the data set used here produced a negative correlation of -0.44. However, it does not automatically follow that a negative correlation between two variables means that a successful trading (arbitrage) strategy can be generated from that relationship.

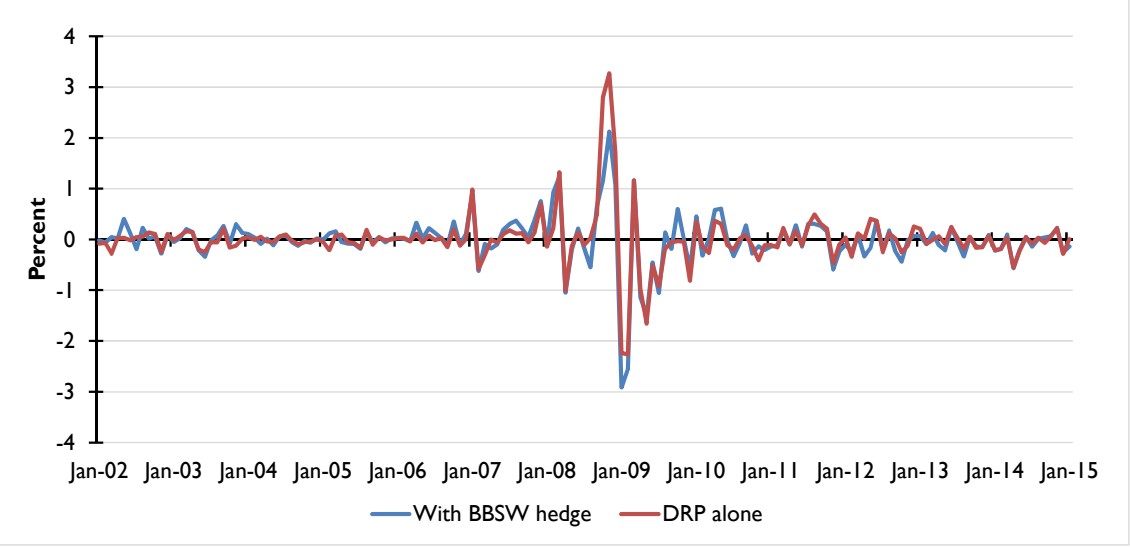
Even in the early 2000's Graphs 2 and 3 showed that including fixed rate risk with DRP risk added to overall volatility rather than reducing it. At that time, even with limited data, there were early warning signals on the efficiency of this strategy.

The strategy implicitly assumes that swap rates and DRPs tend to move in similar, but offsetting ways. Base rates are tied to macro-economic events, specifically inflation while DRPs are company/industry specific as well as impacted by macro–economic events. History shows that there are 'regime changes' in interest rate markets. Base interest rates in the 1970s moved to a high rate environment with the inflation following the first world oil shock and breakdown in the Bretton Woods agreement. Following the 1987 stock market crash and the recession of 1990-91 the regime shifted down to a moderate interest rate and inflation environment. Since the GFC, interest rates globally have gone through another significant regime change where base rates are at record lows in a near-deflationary or actual deflationary environment underpinned by Quantitative Easing (QE). DRPs do not go through such large long term shifts as they are tied to the health of a company or industry which may not be significantly impacted by macro-economic events.

In conclusion, Strategy 1 cannot be considered efficient. It should neither be included in the range of EFP outcomes nor influence the setting of the cost of debt allowance going into the transitional phase.

5.7.6 Analysis and Conclusions for Strategy 2

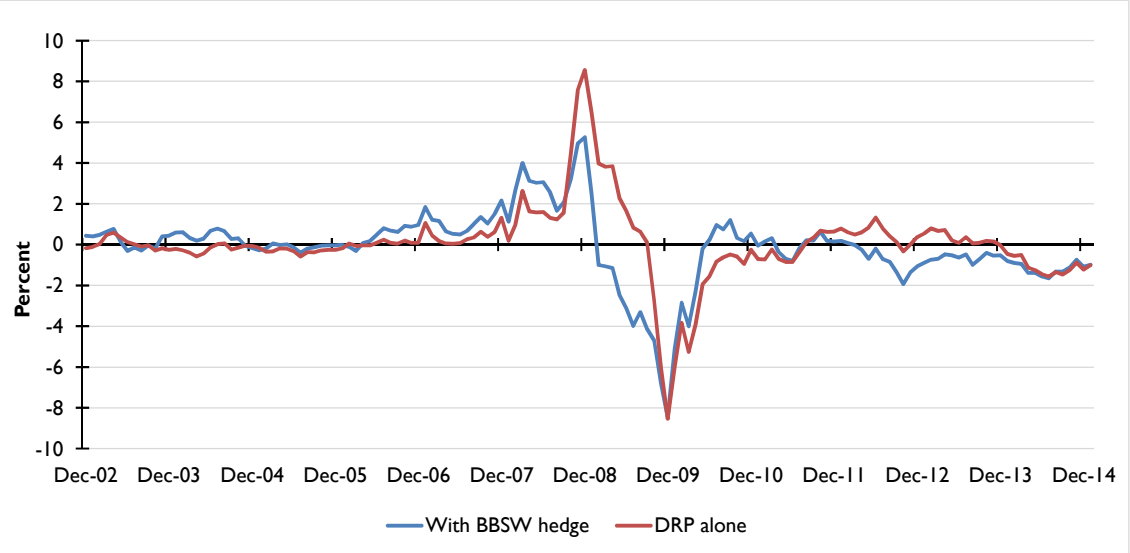
Similar analysis can be undertaken for Strategy 2, as was undertaken for Strategy 1 by simply substituting the short term Bank Bill Swap (BBSW) rates for longer term swap rates. The outcomes are depicted in Graphs 5 and 6.



Graph 5: Monthly Cost Changes of DRP versus BBSW Hedge Strategy

Graph 5 shows a not dissimilar picture to hedging with fixed rates as in Graph 2. Volatility overall is very similar with or without the BBSW hedge. At times it works to offset DRP movements, but it also regularly exacerbates the moves.

Graph 6 shows the annual cost changes in DRP compared to the BBSW hedge strategy.



Graph 6: Annual Cost Changes of DRP versus BBSW Hedge Strategy

Graph 6 highlights the faster and more dramatic reaction of BBSW during the GFC, however the strategy also causes larger deviations for periods of years. In the years leading up to the GFC (2005 to early 2008) the use of floating rate exposure continually added to cost at the same time as the DRP was rising.

In conclusion, for the purpose of this exercise on the evidence available, Strategy 2 cannot be considered efficient for the same reasons as Strategy 1. If an analysis was to be conducted on Strategy 2's performance across multiple regulatory periods, then more factors would need to be included in the analysis, e.g. the slope of the yield curve at the beginning of the regulatory period.

6 COMPENSATION FACTORS

Much of the debate around the appropriate return on debt to apply to regulated energy network providers focuses on individual aspects of the definition or measurement, which at times ignores other, and potentially offsetting, aspects of the overall WACC setting mechanism.

This section of the report examines two key aspects which should be balanced with any discussion of differences between allowed and actual return on debt in the current period, namely:

- Offsetting over and under compensation across multiple regulatory periods during the life of the regulated assets; and
- A higher equity beta to compensate for any mismatch risk in the cost of debt.

6.1 OVERS AND UNDERS

6.1.1 Background

For the base rate component, AER considers the allowed and actual return on debt of a BEE would have approximately matched in each regulatory period under the 'on-the-day' approach. This match is possible because a BEE is able to hedge the base rate component of its debt portfolio under the 'on-the-day approach'. This hedge reduces its interest rate risk.

For the DRP component, AER considers the allowed and actual return on debt of a BEE would usually have differed in each regulatory period. This is because the DRP component cannot be efficiently hedged to the allowed DRP. Consequently, in some regulatory periods, the allowed DRP would have exceeded the actual DRP of a BEE where in others the reverse would have occurred. AER considers that overs and unders would approximately cancel out over time under the 'on-the-day' approach meaning that an NSP would have been fairly compensated for its efficient financing costs over the life of the asset.

This section critically reviews:

- The theory and reasons that over a number of regulatory periods, the differences in the allowed and actual base rate and DRP components would be expected to approximately cancel each other out.
- The particular circumstances of a BEE with the regulatory period timing of the Queensland, SA and Victorian electricity distribution networks and ACT, SA and NT gas pipelines.
- Whether the application of AER's transition to the trailing average leads to an outcome in which differences between the allowed and actual return on debt of a BEE would be expected to approximately cancel out over time.

6.1.2 Assumptions

The following assumptions are made:

- Management decisions to vary the company's financing practices will likely cause overs and unders across time. These decisions may be either efficient or inefficient leading to gains and losses respectively. However, for the purposes of this exercise the results of these decisions are to be excluded from any comparison of actual and allowed cost of debt.
- Research undertaken indicates that the indices of secondary market bond yields used to calculate the allowance overstate the prevailing DRP of new debt issuance actually observed

in the market[22]. This observation was especially the case for bonds with a BBB+ rating which is the targeted rating of a BEE. Any such error in the measurement arising from bond indices such as the RBA and BVAL series is not considered here.

- The allowance has not included hedging costs. While the cost of using interest and cross currency swaps (beyond the quoted market mid-rate) was quite minor in earlier years, it has increased substantially over the past few years.[23] This factor is not considered further.

6.1.3 Qualitative Findings - Occurrence

Overs and unders will have existed in the 'on-the-day regime'. As detailed in Section 5.7.2 there was a systematic mismatch between the allowance calculation and all EFPs for private stand-alone providers.[24] As also noted earlier, the outcome of that mismatch has varied over time and would have led to both overs and unders in different market circumstances.

6.1.4 Qualitative Findings - Causes

Overs and unders existed due to two different characteristics. The first is a bias in the measurement which cannot be expected to offset over time, as it is a systematic mismatch between actual and allowed components. The second characteristic is randomness which may offset as rates move in both directions.

Bias

The bias referred to is the practice of measuring the allowed rate with a 10-year bond rate for a 5-year regulatory period. The 10-year term for the DRP has a reasonable basis, at least in markets where debt of that tenor is available for BBB+ companies. However, the implied 10-year base rate within that measurement was not relevant, due to the practice of re-setting the allowance every five years and the availability of interest rate swaps to hedge for a five year period.

On average this bias would have caused over compensation, as the yield curve is more often than not positively sloped and on average steeper when positive than when negatively sloped. For example, in the monthly data set from December 2001 to September 2015 the 10-year rate was above the 5-year rate 84% of the time with an average difference of 25bp. There are also times when the relationship reverses and an NSP could experience the bias to create an under compensation.

A new bias was introduced through the transitional Guideline Allowance. The Guideline Allowance continued the practice of measuring the whole of the 10-year bond rate, whereas for the transition NSPs can hedge their base rate reset risk by transacting 1-10 year swaps instead of the previous 5-year swap under the on-the-day regime. This bias in the transitional phase will lead to some over compensation on average, due to the positive slope of the swap curve. There is also the possibility that a negative slope can occur, leaving the NSP with an under compensation.

Randomness

Randomness is likely to be the cause of larger mismatches between the allowed and actual cost of debt in an 'on-the-day' regime. This arises from gyrations in market rates over time. The greatest over or under compensation will arise when the regulatory measurement period marks the high or low point of a cycle in the DRP. For example, if the DRP is high but falls during the five years prior to a regulatory measurement period and then rises again during the following five years of the

[22] Chairmont Cost of Debt Transitional Analysis, April 2015, Appendix B
[23] Chairmont, ERA Hedging Costs in the Cost of Debt, May 2015
[24] It may have been possible for government owned providers to source exactly matched funding to remove the mismatch due to the special credit rating and financial status of the state government funding agencies, as was practiced in Queensland and Tasmania.

regulatory period itself, the allowed DRP will under compensate compared to the actual DRP. A cycle in the opposite direction would lead to over compensation.
AER's proposed transitional regime will remove any future randomness in the mismatch. The annual 10% trailing average measurements mean that for that portion of debt, the previous mismatch between actual and allowance should not eventuate. Accordingly, 10% of the portfolio will go to a zero-mismatch position after the first year, 20% after the second year and so on. The only over or under compensation which will occur in the transition phase is a deterministic value based on any mismatch between the running portfolio cost of debt and the measurement of the allowance undertaken at the start of the transition. To emphasise, if AER uses an 'on-the-day' DRP for the allowance, yet the industry is carrying a trailing average staggered debt portfolio with a corresponding trailing average DRP, that fixed difference will be realised by the industry progressively over the 10-year transition. It will be a fixed measurable figure on day one with no further chance of new over or under compensation to occur in the future.

6.1.5 Qualitative Findings - Sequence Risk

The randomness of the mismatch result for providers during the 'on-the-day' regime means that each provider will have different overs and unders experience as they transition to the trailing average. The timing of one NSP's regulatory cycle compared to another's may potentially result in a significant mismatch difference.

The idea of sequence dependence is even stronger in the case of the rapidly growing asset bases of most NSPs over the past two decades. As their RAB and debt have grown, the dollar impact of each basis point of rate mismatch has increased progressively.[25] Hence, the sequence of rate mismatches is equally as important as the average rate mismatch. This concept is similar to an increasingly apparent problem in retirement investment portfolio management that has been identified by the actuarial and investment industry over the past few years.

6.1.6 Qualitative Findings - Offset Over Time

Ignoring bias factors, the question that needs to be considered is whether overs and unders are expected to approximately offset over time. DRPs will experience cycles where they rise and fall; however no conclusive literature has been tabled that demonstrates how long it may take for mismatches to fully offset. As the allowance measurement is made only every five years it will require many regulatory periods to establish enough occurrences to determine whether an offset will occur.

Further complicating the concept of offsetting over time, financial markets have changed significantly in the past 30 years, so that quite different interest rate regimes have existed. The concept of simple regular interest rate cycles seems too theoretical to be applied in practical circumstances.

Finally, in the face of the higher near term weighting of dollar impact of the mismatch described in section 6.1.5, the chance of the random component of mismatches offsetting over time is minimal.

6.1.7 Quantitative Finding - Data

Based on our research and the papers of Lally, QTC and CEG it is concluded that there is insufficient history of relevant BBB bond data to measure over and under compensation for an

[25] As emphasised in QTC, Return on debt transition analysis: A joint report for Energex and Ergon Energy, June 2015. However, QTC's calculation appears to overestimate the effect, due to ignoring a yield curve adjustment for the staggered maturities of new debt.

adequate time period to come to any definitive conclusion about the net result over the life of energy assets[26].

All authors including Chairmont use reliable data going back to 2001. Prior to this date, the data used incorporated different asset types which at best can provide a rough approximation. For example, Chairmont's use of the spread between Government bonds and swaps as a proxy was for illustrative purposes and is not precise enough to be used to determine actual pricing enforceable on a firm.[27]

6.1.8 Combined Findings

To summarise the environment of this consideration:

- Both over and under compensation occurred under the 'on-the-day' regime, a large portion of which was a random result dependent on market conditions at the time.
- The results for accumulated overs or unders will differ greatly between service providers depending on the timing of their regulatory resets and the sequence of overs and unders in relation to their debt growth.
- Historical data earlier than 2001 is either non-existent or unreliable. This means that it is not possible to calculate the trailing average DRPs of earlier regulatory periods.
- The impact of data errors in a calculation could be multiple million or even billion dollar amounts.

It is not necessary to determine an exact measurement technique for calculating overs and unders in the past, as this exercise may still not lead to a definitive answer to the question of correct debt cost recovery over the life of the assets. This conclusion is primarily due to data inadequacy; however even if there was good data it is likely that there would be considerable disagreement across the industry as to the correct methodology for calculating historical overs and unders.

At this point in time, on the evidence submitted and the analysis undertaken, the conclusion is that overs and unders cannot be adequately measured over the life of the assets.

6.2 EQUITY BETA

6.2.1 Background[28]

In determining the return on debt, the rules require AER to have regard to the interrelationship between the return on equity and the return on debt.[29] In considering these interrelationships, AER observes that interest rate risk is a component of systematic risk.[30] Further, AER notes that shareholders are compensated for systematic risk through the return on equity, and specifically the equity beta under the Sharpe-Linter CAPM.[31] Accordingly, they consider a BEE was already compensated through the equity beta component of the return on equity for the risk of differences between the allowed and actual DRP. This is because the sample of privately owned service providers whose practices have informed AER's view of EFP is largely also the same sample of

[26] Lally,M., Transitional arrangements for the cost of debt, November 2014; QTC, Return on debt transition analysis: A joint report for Energex and Ergon Energy, June 2015; CEG, Critique of the AER's JGN draft decision on the cost of debt, April 2015.
[27] Refer Chairmont, Cost of Debt; Transitional Analysis, April 2015, p.41
[28] Refer Appendix A
[29] NER, cl. 6.5.2(k)(2); NGR, r.87(11)(b)
[30] McKenzie and Partington, Risk, asset pricing models and WACC, June 2013, pp.11-12, 16-17
[31] McKenzie and Partington, Risk, asset pricing models and WACC, June 2013, pp.11-12, 16-17

service providers whose empirical equity beta estimates they have had primary regard to in estimating the equity beta.[32] This position was supported by Lally.[33]

This section critically reviews AER's position for the 'on-the-day' approach and the transition to the trailing average.

6.2.2 Assumptions

It is assumed that return on equity is calculated using the Sharpe-Linter model and its underlying assumptions. Notably, equity generates a return only for risks not diversifiable at the investor portfolio level.[34]

6.2.3 Findings - Qualitative Analysis

Under the 'on-the-day' approach both NSPs and sophisticated investors would understand that due to DRP mismatch there is a variability and therefore risk. A professional investor should be aware of the revenue allowance calculation methodology and the well-publicised possible changes. Accordingly, a rational investor would factor this into consideration when valuing an investment opportunity.

If the interest rate risk faced by NSPs could be considered as part of general interest rate risk faced by the market, the equity beta measured by AER would have reflected this risk.

Interest rate risk per se is a systematic risk for all or most companies in the market. However, the form of interest rate risk applicable to NSPs in the 'on-the-day' regime was something quite specific to firms under that regulatory umbrella. Most industries would have had greater total interest rate risk than regulated NSPs, as most enterprises do not have the benefit of a direct link between the interest rate impact of their revenues and their costs which NSPs do. This places NSPs in a better position than an unregulated business, as the allowance is in effect a revenue item that they can manage to, even with the uncertainties of the DRP mismatch component.

Ex-post results for the DRP mismatch would have impacted the profit results of the NSPs, which may then have caused some benefit or drag to the share price of the specific NSP. However, it may be argued that this is not a systematic risk. The variability of cashflow is specific to the industry and the individual NSP and may be diversifiable by investors. If this is so, then the required return on equity would not be affected by the DRP mismatch risk as it was a diversifiable specific risk rather than a component of market systematic risk. Therefore, the return on equity should be the same regardless of the existence of DRP mismatch risk and beta should not change because of it.

It is noted that practically this risk is an important concern for a company; however given equity pricing theory a non-generic risk that is applicable to a relatively minor segment of the economy is unlikely to be considered a market wide systematic risk which will affect the return on equity.

[32] AER, Final Decision- Review of electricity transmission and distribution WACC parameters, May 2009 pp. 255-260, 331-332; AER, Explanatory statement to final rate of return guideline (appendices), December 2013, pp.46-49

[33] Lally, M., Review of submissions on the cost of debt, April 2015, p.25

[34] McKenzie and Partington, Risk, asset pricing models and WACC, June 2013 p.4-5 reminds us that risks which can be diversified by a portfolio investor are not rewarded by a higher return.

7 OUTCOMES AND IMPLICATIONS FOR A BEE

7.1.1 Efficient Financing Practices

Outcomes	Implications
1. A variety of EFPs exist which produce higher and lower costs than the Basic Approach, where absolute and relative costs vary over time.	The benchmark is achievable while providing an opportunity for NSPs to adopt alternative EFPs to outperform it. See Section 8.4.
2. Strategies with base rate risk, i.e. trailing fixed rates or floating rates, may cost significantly more or less than the Basic Approach.	If these were EFPs, it would mean that the Basic Approach may not be a reasonable approximation of the range of EFPs.
3. The trailing fixed and floating rate strategies are not considered efficient.	These strategies should be excluded from EFPs.
4. AER's Basic Approach gives a cost of debt which is in, or perhaps at the upper level of the range of EFPs.	AER can continue to use their assumed EFP as a simple and effective benchmark as long as it is acknowledged that it may be currently near the high end of the range.
5. The Guideline Allowance can produce cost of debt results noticeably above and below the range of EFP results.	Over time the Guideline Allowance is not a consistent indicator of the true cost of debt going into the transition.
6. In the first half of 2015 by coincidence the Guideline Allowance produced a result close to the average of EFPs.	This coincidence does not change the implication above, i.e. it is not a stable method.

7.1.2 Compensation Factors

Outcomes	Implications
1. Bond data is inadequate to reasonably measure over and unders across the life of energy infrastructure assets.	The past experience of BEEs during the 'on-the-day' regime should not impact decisions about the future, i.e. the transitional phase.
2. There is no reason to believe that overs and unders would have cancelled out for all NSPs/BEEs.	
3. DRP risk in the 'on-the-day' regime was most likely not compensated by a higher equity beta, nor do equity holders need to be compensated for that risk.	

8 NSP RESPONSES

8.1 BACKGROUND

AER recently sent information requests to the privately owned service providers with current regulatory processes. These are the Victorian electricity distribution networks (AusNet Services, CitiPower, JEN, Powercor, and United Energy), the SA electricity distribution network (SA Power Networks) and the SA gas distribution network (AGN). These information requests sought information on the actual financing practices and costs of those networks.

This section critically reviews whether each response appears to answer the questions posed by the AER in an accurate and supported manner and draw general inferences about any implications for the determination of EFP and the setting of the cost of debt allowance.

8.2 SUMMARY OF RESPONSES

All of the NSPs answered the questions to a large degree and supported them by providing listings of debt and hedging instruments and their costs. The detailed written responses are collated by question in Appendix B.

As expected the overarching outcome is that each NSP approaches debt and hedging in a different way. The single point of consistency is that all providers act with some degree of flexibility rather than following an automatic pre-set approach.

The key findings are:

- All of the NSPs answered the questions to a large degree with supporting evidence of their debt positions, hedging instruments and costs.
- Regulated firms approach debt and hedging in a variety of ways.
- There is flexibility in approach rather than following automatic pre-set methods or styles.
- Debt is raised for a variety of terms, anywhere from two years to 30 years, utilising the bank debt market as well as domestic and foreign bond markets.
- Debt raisings are staggered to be no greater than [c-i-c]%, and usually closer to 10%, of total debt in any one year. In some years none was raised.
- While many NSPs fully or largely hedge the base rate to the regulatory period, some carry partial trailing fixed rate exposure, floating rates or a mixture of the two.
- The company and/or group structure appears to influence their funding decisions and outcomes, including many having some non-vanilla debt, in particular hybrid or subordinated debt from a parent or group.
- All foreign currency exposure appears to be neutralised.
- Choice of debt raising type and timing depends on many internal and external market factors, so that it will vary over time.
- At least some NSPs hedge the base rate of planned future debt increases in order to better manage interest rate risk between the allowance set at the beginning of the regulatory period and the base rate applicable in the future when the debt is expected to be raised. This requires the firms to transact forward starting interest rate swaps, which are usually at a higher rate than current starting swaps, thereby implying a higher actual cost of debt than allowed cost of debt for that portion.
- All NSPs which require external funding need to raise debt approximately six months before the existing debt matures, so that there is some timing and cost difference between a simple rolling rate measurement and the actual cost of debt.

8.3 HARMONISED SPREADSHEET INFORMATION

Chairmont summarised the spreadsheet data as follows:

1. Staggered debt maturity profile.
2. Net fixed interest rate maturity profile.
3. The term, timing and DRP of debt raised.

The information is represented graphically for each company in Appendix C. The spreadsheets appear to have a few minor errors, inconsistencies and missing relevant related data which could be raised with the relevant NSP for clarification, if more precise calculations are required in the future.

8.3.1 Debt Maturity Profile

All companies' outstanding debt listings confirm a staggered debt maturity of outstanding debt in 2015. There is considerable variation between companies, ranging from a reasonably even pattern predominantly over the next 10 years, to maturity profiles which are biased strongly to the next 4-5 years and others with up to [c-i-c]% of debt maturing in a single year.

Almost every NSP reported holding subordinated debt, usually with a longer term than the standard senior debt. The subordinated debt is mainly from shareholders or group companies and acts as a bridge to equity within the capital structure.

8.3.2 Net Fixed Rate Maturity Profile

This section in Appendix C displays the fixed base rate profile for the companies after taking into account the following:

- Whether the debt is fixed or floating rate.
- Swaps which are used to convert fixed debt issues to floating at the time of issue.
- Swaps which are used to pay fixed rate to link with the fixed rate regulatory allowance.

Some companies reflect an almost identical base rate profile to that assumed in AER's Basic Approach to EFP, i.e. fixed base rates only matching the regulatory period. However, other companies display a partial trailing fixed rate component mixed with a large portion to match the regulatory period. These do not use a smoothly staggered fixed base rate approach.

A small number of companies keep some floating base rate exposure, and there is evidence of this being combined with a partial trailing fixed rate component.

8.3.3 The Term, Timing and DRP of Debt Raising

Both of sections 8.3.1 and 8.3.2 are 'point-in-time' representations of the company's debt and hedging. This section seeks to give a slightly different observation of the company's behaviour in recent times by examining when they issued the debt they currently hold, how long the original term was and how DRPs have varied for it.

Once again a range of practices and results are evident. It varies from a heavy reliance on shorter term issues, at least since the GFC, to significant reliance on terms much longer than 10 years. All providers appear to have avoided or minimised any debt raising during the worst of the GFC, altering their behaviour to respond efficiently to market events.

[Commercial-in-confidence—Text redacted]

8.4 CRITICAL REVIEW OF NSP RESPONSES

NSPs have structured their portfolios in quite different ways via a mix of issuance maturities, percentage issued per year, capital structures and base rate risk policies. It shows a healthy competitive approach to maximising returns by active decision taking.

Some firms have taken what appear to be inefficient or speculative decisions, or a combination of both by introducing base rate risk. This is a natural part of a competitive industry and is a positive sign that benchmark regulation allows room for individual enterprises to manoeuvre. A competitive industry should expect to see winners and losers amongst participants.

9 NSP TO BEE

9.1 COMPARATIVE ANALYSIS

It is clear that companies act differently to each other and change their financing behaviour in response to changed market and company circumstances.

The strategy simulation in Section 5 aligns with many of the practices actually followed by the companies. Especially Strategies 3, 4 and 5 in varying formulations reflect the reality of NSP behaviour, i.e. they at times raise both longer and shorter term debt than the AER benchmark and issue more or less than 10% per year for a mix of opportunistic and strategic reasons.

All NSPs were able to avoid long term issuance during the period of highest DRPs at the time of the GFC in 2008-09, thereby using flexibility to maintain a lower cost of debt than the simple benchmark recorded in those years.

One area of difference between AER's EFP and some NSPs is in respect to base rate fixing practices. AER's EFP model assumes that all base rate risk should be removed by aligning fixed rate swaps to the regulatory fixing cycle. Some NSPs fully adopt this approach, whereas most others adopt the Basic Approach for the majority of their portfolio. It was observed that the approach of having the majority of the base rate risk different to the AER benchmark also occurred.

Use of subordinated debt, preference shares and hybrid products are common place in capital structures. These instruments that have quasi debt and equity features are important sources of funds.

9.2 IMPLICATIONS

NSPs' responses to AER's information request show that there is an alignment to AER's EFP approach and those of the majority of the industry.

9.2.1 Term and Percentage Issued Annually

The use of 10% per year of 10-year debt is not unreasonable over the long term, despite observing reactive and diversified debt terms and amounts.

It is possible to build a time-varying debt term and ratio into a benchmark; however, it would add further degrees of complexity and must be flexible to adapt to changes in markets. This may not achieve the desired long term outcome over the life of the asset.

Conversely, if debt markets were to either lose liquidity or totally close in longer terms of 10 years, the benchmark measurement should not attempt to keep the 10-year debt assumption. Instead it would need to adopt new average issuance assumptions.

9.2.2 Past Fixed Base Rate Profile

Company responses indicate that many already follow a practice of fixing all, or nearly all, base rates in line with the regulatory period, as assumed by AER. While some use alternative approaches, there is no approach that could be adopted as a standard used by a majority. Given the findings in Section 5.7, Chairmont sees no need for AER to consider a trailing average or floating base rate fixing approach to EFP for the 'on-the-day' or transitional regimes.

9.2.3 Transitional Fixed Base Rate Calculation

Where the companies refer to their base rate fixing going into the new transitional regime, they confirm Chairmont's earlier observation that the required swaps going forward are a series of 1-year to 10-year swaps to connect with the gradual inclusion of a trailing average regime. NSPs' do not propose using just 5-year swaps, as was relevant in the previous 'on-the-day' regime.

The implication is that the relevant base rate to be used for the allowance calculation is the average of the 1-10 year swap rates rather than the implied 10-year swap rate included in observing a 10-year BBB bond yield. This means that AER's Guideline Allowance calculation, which uses the 10-year bond yield, creates a mismatch between actual and allowed base rates.

APPENDIX A: TERMS OF REFERENCE

REQUEST FOR QUOTE (RFQ) FOR THE PROVISION OF CONSULTANCY SERVICES

Return on debt: Considerations concerning the AER's transition to the new approach

The AER seeks expert advice to inform its upcoming decisions on the return on debt for electricity distribution networks in Queensland, South Australia and Victoria and for gas pipelines in the Australian Capital Territory (ACT), Northern Territory (NT) and South Australia.

In 2013, the AER released its rate of return guideline (Guideline). In the Guideline, the proposed a change in the approach to estimating the return on debt. In previous decisions, an 'on-the-day' approach was applied.[35] In the Guideline, the AER proposed that an on-the-day rate would be used (for the last time) in the first year of the new regulatory period for each service provider. After that, the AER would transition to a 'trailing average' approach. The transition would occur through partially updating the return on debt each year (10 per cent each year) based on prevailing interest rates in each new year. After 10 years, the transition would be complete and the return on debt would fully reflect a 10 year trailing average.[36]

In its late 2014 and early 2015 network determinations, the AER maintained its position on transitioning to a trailing average approach.[37]

In recent months, the AER has received proposals and submissions from various electricity and gas network service providers. These service providers agree with transitioning to a trailing average, but disagree with the form of transition that the AER has adopted. Generally, these service providers propose a 'hybrid' transition which combines a prevailing base rate with a historical debt risk premium (DRP).

The AER seeks expert advice on, and a review of, several matters raised by service providers on the topic of transition to a trailing average approach. In particular, the AER seeks:

- Advice on the efficient financing practices of a benchmark efficient entity under the previous 'on-the-day' approach, and therefore what the debt portfolio of a benchmark efficient entity would be at the start of the new regulatory period, along with what efficient financing practices a benchmark efficient entity would adopt under the AER's transition approach.

[35] The 'on-the-day' approach estimates the allowed return on debt based on prevailing interest rates around the start of the regulatory period. At the next network determination, the allowed return on debt is reset based on prevailing interest rates around the start of the new regulatory period.

[36] The 'trailing average' approach estimates the allowed return on debt based on interest rates averaged over a moving historical period. Each year, prevailing interest rates from each new year are added to the trailing average, and interest rates from the last year of the trailing average 'fall out' of the trailing average.

[37] The AER's transition mechanism has not changed since the Guideline. However, throughout the Guideline and recent determinations the AER has further augmented or nuanced its reasons for a transition, and the particular form of transition, in each subsequent round of Guideline and network determination documents.

- Advice on the extent of any under or over recovery of borrowing costs experienced by a benchmark efficient entity in the circumstances of particular service providers under the previous on-the-day approach, and under the AER's transition approach.
- A review of information on the actual financing practices and costs of particular service providers, which may inform the answers to the above issues.

It is anticipated that the services will mainly be required between when the contract is signed and early October 2015.

Background

The AER is responsible for the economic regulation of electricity networks and gas pipelines in Australia.[38] In undertaking this role the AER sets the allowed revenues or prices for these monopoly service providers over a fixed period determined in advance (usually 5 years),[39] in accordance with the relevant legislation.[40] As part of determining the total revenues that a service provider may earn, the AER applies a 'building block' framework that includes a return on capital building block, which is derived from a regulated rate of return.[41]

The rules require us to determine an allowed rate of return that achieves the allowed rate of return objective.[42] The allowed rate of return objective is that the rate of return for a network service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of regulated network services.

Better regulation—Rate of return guideline

In November 2012, the Australian Energy Market Commission (AEMC) published changes to the National Electricity and Gas Rules (NER, NGR). The AER's Better Regulation program was initiated to update and improve its processes under these new rules, with the aim of delivering an improved regulatory framework focused on the long term interests of electricity and gas consumers.

The Better Regulation program involved the publication of several guidelines. The rate of return guideline (the 'Guideline'), published in December 2013, was developed under extensive consultation and sets out the AER's proposed approach to determining the allowed rate of return in accordance with the relevant legislation.[43] It applies to both electricity and gas distribution and transmission network service providers.

The Guideline sets out the approach the AER proposes to use to estimate the returns on equity and debt for a benchmark efficient entity.[44] The Guideline also sets out the approach the AER proposes to use to estimate the value of imputation credits under the Australian tax system. The value of imputation credits mostly impacts the separate company tax building block. However, the WACC must be set on a nominal vanilla basis consistent with the estimate of the value of imputation credits.

[38] Excludes Western Australia.
[39] This period is known in an electricity context as a regulatory control period or in a gas context as an access arrangement period.
[40] For electricity networks, this means the National Electricity Law (NEL) and National Electricity Rules (NER). For gas networks, this means the National Gas Law (NGL) and National Gas Rules (NGR).
[41] That is, the rate of return on capital is multiplied by the regulated asset base (for electricity networks) or the capital base (gas networks) to derive the return on capital building block for a given year.
[42] NER, clauses 6.5.2(b), 6.5.2(d), 6A.6.2(b) and 6A.6.2(d). NGR, rule 87(2) and 87(4).
[43] AER, *Rate of return guideline*, December 2013.
[44] The Guideline defines the benchmark efficient entity as a pure play, regulated energy network business operating within Australia.

The Guideline is not legally binding on the AER or network service providers. However, if the AER or a service provider chooses to depart from the guideline, it must state its reasons for doing so in the relevant regulatory determination or proposal.

In the Guideline, the AER proposed a change in the approach to estimating the return on debt. The AER proposed to change from the previous approach of using prevailing market interest rates, averaged over a 10–40 business day period, as close as practical to the start of the regulatory period (the 'on the day' approach) to a 'trailing average' portfolio approach. The trailing average means that the regulatory return on debt is partially updated each year to reflect prevailing market interest rates in each new year. The AER proposed to gradually transition to the new approach. The gradual transition involved estimating an 'on-the-day' rate for the first regulatory year of the new regulatory period and updating 10 per cent of that rate each subsequent year based on prevailing market interest rates in each new year. After 10 years the transition would be complete, and the regulatory return on debt would reflect an equally weighted 10 year historical trailing average in each year from that point onwards.

In the Guideline, the AER proposed that it would estimate the return on debt based on a BBB+ benchmark credit rating and a 10 year benchmark term. The AER also proposed that it would annually update the return on debt based on the data series published by one or more third party data service providers. However, at that time, the AER had not formed a view on which third party data series to use. The AER proposed that the annual update would use an averaging period each year of between 10 business days and 12 months, with the exact dates chosen by the service provider, subject to the service provider's nominated averaging periods adhering to certain conditions.

For both practical and legal reasons, the annual update to the return on debt is required to be 'automatic'. We interpret this to mean that the methodology to perform the annual update must be fully specified upfront in the regulatory determination such that no judgement or discretion is required to be exercised when estimating the annual update.

Recent AER regulatory determinations

In its round of November 2014 draft decisions, the AER maintained its position on gradually transitioning to a trailing average return on debt. The AER also decided to annually update the trailing average portfolio return on debt, over each service providers' averaging period, using a simple average of:

- the RBA broad-BBB rated 10 year curve (the RBA curve),[45] extrapolated to an effective term of 10 years, and
- the Bloomberg Valuation Service broad-BBB rated curve (the BVAL curve).[46] Depending on the maximum term published at the time, this will be either the BVAL:
    - 7 year estimate, extrapolated to 10 years using the 7–10 year margin from the RBA curve, or

[45] The RBA refers to this curve as 'Non-financial corporate BBB-rated bonds'.
[46] The Bloomberg ticker for this curve is: BVCSAB07.

- 5 year estimate, extrapolated to 10 years using the 5–10 year margin from the RBA curve.

The AER's position was informed by reports it commissioned from Dr Lally and the ACCC Regulatory Economic Unit. These draft decisions were for electricity distribution networks in NSW and ACT, electricity transmission networks in NSW and Tasmania, and a gas distribution network in NSW.

In its April and June 2015 round of final decisions for those networks (and preliminary decisions for Queensland and SA electricity distribution networks), the AER largely maintained its position on both choice of data series and extrapolation/interpolation adjustments. However, between the draft and final decisions Bloomberg changed its curve fitting methodology used in estimating the BVAL curve. As a result of these changes, it correspondingly recommenced publishing estimates out to a 30 year term, including a 10 year yield estimate. All relevant averaging periods for these service providers had finished prior to that change (which occurred on 14 April 2015), and as a result we have not yet applied the extended published term. However, in the latest round of decisions, the AER adopted a simple average of:

- the RBA curve, extrapolated to an effective term of 10 years, and
- the BVAL curve.[47] Depending on the maximum term published at the time, this will be either the BVAL:
  - 10 year estimate, or
  - 7 year estimate, extrapolated to 10 years using the 7–10 year margin from the RBA curve.

That is, where available, the AER's decision was that for future averaging periods it would use the 10 year BVAL estimate without extrapolation.

Further details on AER's return on debt approach

In its April and June 2015 round of decisions, the AER considered four broad options for the approach used to estimate the return on debt. These options were:[48]

- Option 1—Continue the on-the-day approach
- Option 2—Start with an on-the-day rate for the first regulatory year and gradually transition into a trailing average approach over 10 years
- Option 3—Hybrid transition. Start with an on-the-day rate for the base rate component and gradually transition into a trailing average approach over 10 years. This would be combined with a backwards looking trailing average DRP (that is, a base rate transition only).

[47] The Bloomberg ticker for this curve is: BVCSAB10.

[48] There were also variations to some of these options that are possible, particularly to option 3. The AER considered some of these variations in appendix G of attachment 3. Further, in the Guideline and November 2014 draft decisions the AER also considered another option which was to continue to the set the base rate component of the return on debt based on prevailing market conditions at the time of each future regulatory determination and combine with a trailing average DRP. However, as no stakeholder advocated that position at the time, nor was it the current approach, the AER did not consider that option further. For the AER considerations on this option, Refer: AER, Draft decision Jemena gas networks access arrangement 2015–20 Attachment 3, November 2014, appendix G2, pp.423–426.

- Option 4—Adopt a backwards looking trailing average approach (that is, no transition on either the base rate or DRP components of the return on debt).

The AER was satisfied that continuing with the on-the-day approach (Option 1) or gradually transitioning to the trailing average approach (Option 2) *would* contribute to the achievement of the allowed rate of return objective. Whereas the AER considered the hybrid transition (Option 3) *may* contribute to the achievement of the allowed rate of return objective. The AER's preferred option was to gradually transition from the on-the-day approach to the trailing average approach (Option 2). The AER considered Option 2 would better satisfy the allowed rate of return objective than Option 1 or Option 3. Further, The AER considered a backwards looking trailing average approach (Option 4) *would not* contribute to the allowed rate of return objective.

The following section summarises the AER's assessment of each of the four options.

Option 1—Continue the on-the-day approach

The AER noted that as the on-the-day approach has been the long standing approach adopted by Australian regulators, it is natural to consider the merits of continuing with that approach relative to the merits of changing to a new approach. That is, if the AER changed to a new approach it should be because the AER considered the new approach better satisfies the allowed rate of return objective than continuing with the current approach.

The AER was satisfied that the on-the-day approach (Option 1) is a reasonable approach and would contribute to the achievement of the allowed rate of return objective. This is because:

- it provides a benchmark efficient entity with a reasonable opportunity to recover its efficient financing costs over the life of its assets
- the approach is unbiased—at the time averaging periods are nominated they are in the future and so avoids a bias in regulatory decision making that can arise from choosing an approach that uses historical data after the results of that historical data is already known.
- the on-the-day approach was the approach the AER and its predecessor energy regulators applied in the past when service providers issued their existing debt—continuing to apply that approach maintains the outcomes of service provider's past financing decisions, consistent with the principles of incentive regulation.
- it avoids practical problems with the use of historical data as estimating the return on debt during the global financial crisis is a difficult and contentious exercise.[49]
- it remains the standard approach adopted by several other Australian regulators[50] and is supported by advice from an academic perspective (Dr Martin Lally).[51]

[49] AEMC, *Directions paper–National electricity amendment (Economic regulation of network service providers) rule 2012 and national gas amendment (price and revenue regulation of gas services) rule 2012*, March 2012, pp. 105–106

[50] For example, QCA proposed to maintain the on-the-day approach with five year term for the risk free rate component and 10 year term for DRP. For more details, Refer: QCA, *Trailing average cost of debt: draft decision*, 24 August 2014, p.24. On the other hand, the ERA retained a form of the 'on-the-day' approach but with annual updates to the debt risk premium component of the total cost of debt. It also applies five year debt term. Economic Regulation Authority (ERA) Western Australia, *On the benchmark cost of debt: efficiency considerations*, June 2013.

[51] Lally, *The trailing average cost of debt*, 19 March 2014, p.51. Also, SFG advised that the on-the-day approach satisfies the NPV principle and matches the regulated rate of return to the 'true cost of captial', whereas the trailing average approach would create investment

Option 2—Gradual transition to the trailing average approach

The AER was also satisfied that gradually transitioning from the on-the-day approach to the trailing average approach (Option 2) was reasonable and would contribute to the achievement of the allowed rate of return objective. This is because it shares some of the positive attributes of the on-the-day approach. Specifically the on-the-day approach (Option 1) and therefore also Option 2:

- provides a service provider with a reasonable opportunity to recover its efficient financing costs over the life of its assets— it therefore mitigates any impact on a benchmark efficient entity that could arise as a result of changing the methodology to estimate the return on debt.
- is unbiased—at the time averaging periods are nominated they are in the future and so avoids a bias in regulatory decision making that can arise from choosing an approach that uses historical data after the results of that historical data is already known.
- the on-the-day approach was the approach applied by the AER and its predecessor energy regulators in the past when service providers issued their existing debt—continuing to apply that approach to existing debt maintains the outcomes of service provider's past financing decisions, consistent with the principles of incentive regulation.
- avoids practical problems with the use of historical data as estimating the return on debt during the global financial crisis is a difficult and contentious exercise.

At the same time, it partly matches the allowed return on debt with a benchmark efficient entity's financing cashflows over the next access arrangement period as its transitions its financing practices to the trailing average approach.[52]

The AER considered commencing with an on-the-day rate and gradually moving towards the trailing average approach (Option 2) is preferable to maintaining the on-the-day approach (Option 1). This is because the eventual adoption of a trailing average approach:

- Reduces risk for service providers by providing a regulatory benchmark that they can more readily match in each access arrangement period,[53] and
- Reduces price volatility for consumers across access arrangement periods in the medium to long term.[54]

Gradually moving from the on-the-day to trailing average approach was supported by advice the AER received from both a financial market practitioner (Chairmont) and a finance and regulatory economics academic (Dr Lally).[55]

distortions and the only arguments in favour of a trailing average approach are based on practical considerations. SFG, *Preliminary analysis of rule change proposals*, February 2012, pp.46–48.

[52] Specifically, it broadly matches (though over-compensates) a benchmark efficient entity for the base component of its cost of debt. This is because it is based on a 10 year term, whereas the impact of hedging is to reduce the effective term of the base rate. And as the yield curve is typically upward sloping, shorter term debt is typically cheaper than longer term debt. Whether the allowed DRP matches, or is higher or lower than, a benchmark efficient entity's financing cashflows with respect to the DRP component depends on whether the prevailing and historical average DRP is higher, lower, or around the same level as each other.

[53] AER, *Explanatory statement to the final rate of return guideline*, December 2013, pp.108–110.

[54] AER, *Explanatory statement to the final rate of return guideline*, December 2013, pp.108–110; AER, *Draft decision–TransGrid–Transmission determination–Attachment 3*, November 2014, pp. 123–124.

[55] Lally, *Transitional arrangement for the cost of debt*, November 2014, pp.3–5; Lally, *Review of submissions on the cost of debt*, April 2015, pp.3–6; Chairmont, *Cost of debt: Transitional analysis*, April 2015, pp.5–11.

Option 3—Hybrid transition

The AER considered the hybrid transition (Option 3) may be a reasonable approach and contribute to the achievement of the allowed rate of return objective, but it was not the AER's preferred approach. The benefits of this approach are that it:

- consistent with the principles of incentive regulation, it maintains the outcomes of service provider's past financing decisions by continuing to apply the on-the-day rate to the component of the debt which service providers had most control over (the base rate component)
- provides a good match between the allowed return on debt and a benchmark efficient entity's financing costs over the period it takes a benchmark efficient entity to transition its financing practices to the trailing average approach.

The shortcomings of the hybrid transition include:

- Transitioning from the on-the-day approach using the hybrid transition can create a mismatch between the allowed return on debt and the efficient financing costs of a benchmark efficient entity over the life of its assets. The change in the regulatory regime can therefore create windfall gains or losses to service providers or consumers. Windfall gains or losses do not result from a service provider's efficient or inefficient decisions. Rather, they are a side effect of changing the methodology for estimating the return on debt at a particular point in time. Such gains or losses should be avoided, so that economic regulatory decisions deliver outcomes based on efficiency considerations, rather than timing or chance.
- It has the potential to create a bias in regulatory decision making by choosing an approach that uses historical data after the results of that historical data is already known
- It does not avoid the practical difficulties with the use of historical data for the component of the return on debt where these difficulties arise (the DRP component).
- A gradual transition to the trailing average approach (option 2) was the approach the AER proposed in the Guideline and service providers may have already commenced changing their financing practices in expectation that approach would be applied. Accordingly, the AER has not had a full opportunity to consult on this proposal, and as Chairmont advised, switching now to the hybrid transition may be disruptive to the industry.[56]

Option 4—Backwards looking trailing average approach

The AER was not satisfied that adopting a backwards looking trailing average (Option 4) was reasonable or would contribute to the achievement of the allowed rate of return objective. This is because it:

- would lead to a mismatch between the allowed return on debt and the efficient financing costs of a benchmark efficient entity over the life of its assets. This means that over the life of the assets a benchmark efficient entity is likely to either over- or under-recover its efficient financing costs.

[56] Chairmont, *Cost of debt: Transitional analysis*, April 2015, p.11. As set out in this section and below, we also have other reasons for applying a transition to debt risk premium.

- does not approximately match the allowed return on debt with the efficient financing costs of a benchmark efficient entity over the new regulatory period as it transitions its financing practices to the trailing average approach. Given a benchmark efficient entity will already have financing practices in place it entered into in the past, it needs time to unwind these practices and gradually adopt practices that match the trailing average approach. This transformation cannot occur instantly.

- has the potential to create a bias in regulatory decision making that can arise from the selection of historical data after the results of that data is already known.

- does not avoid practical difficulties with the use of historical data

Current AER regulatory determinations

The AER is currently reviewing initial proposals from:

- Victorian electricity distribution networks—AusNet, CitiPower, Jemena Electricity Networks (JEN), Powercor and United Energy, and

- ACT, NT and SA gas networks—ActewAGL, Australian Gas Networks (AGN) and Amadeus.

The AER is also reviewing revised proposals from Qld and SA electricity distribution networks (Energex, Ergon, SA Power Networks). The table below sets out the key dates for the various determination processes.

Key dates for current regulatory determination processes

Service provider	Regulatory period	Regulatory process					
		Proposal	Sub-missions	Draft decision	Revised proposal	Sub-missions	Final decision
Electricity distribution—Qld and SA							
Energex, Ergon Energy, SA Power Networks	1 July 2015 – 30 June 2020	6 December 2014	30 January 2015	30 April 2015	3 July 2015	24 July 2015	29 October 2015
Electricity distribution—Victoria							
AusNet Services, Citipower, Powercor, United Energy, Jemena Electricity Networks	1 January 2016 – 30 Dec 2020	30 April 2015	13 July 2015	29 October 2015	30 January 2016	February - March 2016	30 April 2016
Gas—ACT, SA and NT							
ActewAGL	1 July 2016 – 30 June 2021	30 June 2015	31 July 2015	30 November 2015	30 January 2016	February - March 2016	30 April 2016
AGN	1 July 2016 – 30 June 2021	1 July 2015	10 August 2015	30 November 2015	30 January 2016	February - March 2016	30 April 2016
Amadeus	1 July 2016 – 30 June 2021	4 August 2015	2 September 2015	30 November 2015	30 January 2016	February – March 2016	30 April 2016

Each of the service providers in the above table has proposed a 'hybrid' transition to the trailing average approach.

All service providers have proposed a hybrid transition which starts with an on-the-day rate for the base rate component and gradually transitions into a trailing average approach over 10 years. This would be combined with a backwards looking trailing average DRP (that is, a base rate transition only). Some service providers have proposed that the base rate be calculated as an average of the 1

to 10 year swap rates, with an allowance for the transaction costs of interest rate swaps to be added to the return on debt allowance.

In addition, some service providers have indicated a hybrid transition should involve a variation on the base rate transition outlined above. Specifically, a base rate transition which starts with a partially on-the-day rate and partially backwards looking base rate. This is mostly based on a view that movements in the base rate and DRP are partially offsetting, and so a benchmark efficient entity would not have fully hedged its base rate interest rate risk under the on-the-day approach.

Further, the reasons for a backwards looking DRP include that the AER has made factual errors in its understanding of the under or over-recovery of a benchmark efficient entity of its borrowing costs under the on-the-day approach. That is, rather than at the time of the transition there being an accumulated over-recovery of previous borrowing costs, there is an accumulated under-recovery.

The AER seeks expert advice on these and related matters.

Legislative framework for the determination of the allowed rate of return

In determining the rate of return, the AER is guided by requirements in both:

- the national electricity law (NEL) and national gas law (NGL), and
- the national electricity rules (NER) and national gas rules (NGR).

The expert advice is required in the context these requirements.

Requirements of the law

Under the NEL, the AER must determine the rate of return in a manner that will or is likely to contribute to the achievement of the national electricity objective (NEO).

> The **national electricity objective** is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> - price, quality, safety, reliability and security of supply of electricity, and
> - the reliability, safety and security of the national electricity system.

The AER must also take into account the revenue and pricing principles when determining the rate of return.

Of relevance to the rate of return are the following **revenue and pricing principles**:

- A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in:
    - providing regulated network services, and
    - complying with a regulatory obligation or requirement or making a regulatory payment.
- A regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to regulated network services the operator provides. The economic efficiency that should be promoted includes:
    - efficient investment in a distribution system or transmission system with which the operator provides regulated network services; and
    - the efficient provision of electricity network services; and
    - the efficient use of the distribution system or transmission system with which the operator provides regulated network services.
- A price or charge for the provision of a regulated network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the regulated control network service to which that price or charge relates.
- Regard should be had to the economic costs and risks of the potential for under and over investment by a regulated network service provider in, as the case requires, a distribution system or transmission system with which the operator provides regulated network services.
- Regard should be had to the economic costs and risks of the potential for under and over utilisation of a distribution system or transmission system with which a regulated network service provider provides regulated network services.

Equivalent provisions apply under the NGL.

Requirements of the rules

Under the NER, the allowed rate of return is to be determined such that it achieves the allowed rate of return objective.

> The **allowed rate of return objective** is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of regulated network services.

The NER require that the allowed rate of return for a regulatory year must be:

- a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs and the return on debt for that regulatory year, and
- determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits.

In determining the allowed rate of return, the NER also require that regard must be had to:

- relevant estimation methods, financial models, market data and other evidence
- the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt, and
- any interrelationships between estimates of financial parameters that are relevant.

Specifically on the return on debt, the NER also states:

- The return on debt for a regulatory year must be estimated such that it contributes to the achievement of the allowed rate of return objective.
- The return on debt may be estimated using a methodology which results in either:
    - the return on debt for each regulatory year in the regulatory control period being the same, or
    - the return on debt (and consequently the allowed rate of return) being, or potentially being, different for different regulatory years in the regulatory control period
- Subject to the allowed rate of return objective, the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:
    - the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the making of the distribution determination for the regulatory control period,

- the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period, or
- some combination of these returns.

- In estimating the return on debt such that it contributes to the achievement of the allowed rate of return objective, regard must be had to the following **return on debt factors**:
  - the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective
  - the interrelationship between the return on equity and the return on debt
  - the incentives that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of any capital expenditure, and
  - any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next.
- If the return on debt is to be estimated using a methodology that results in the regulatory on debt being (or potentially being) different for different regulatory years, then a resulting change to the service provider's annual revenue requirement must be effected through the automatic application of a formula that is specified in the distribution determination.

Equivalent provisions apply under the NGR.

The NER and NGR concerning the determination of the rate of return were revised in 2012 by the AEMC. The AER's 2013 rate of return guideline was conducted under this framework. Of particular importance under the new rules framework is the introduction of the allowed rate of return objective, and the primacy given to this objective over other rule requirements.

Background documents for the advice

The expert advice is expected to engage with key documents, including the AER's rate of return guideline, recent AER regulatory determinations and commissioned expert reports, and current regulatory proposals before the AER along with the commissioned expert reports submitted by service providers with current regulatory proposals. These background documents are listed in the attachment, together with hyperlinks to enable easy access

Documents which are not available on the internet are attached to this request for quote.

There are also confidential material relevant to this advice. This material will be forwarded to the expert after a confidentiality deed has been signed.

It is expected that the consultant will engage more broadly, including relevant academic literature or other research.

Services required

In the AER's Guideline and late 2014 and early 2015 network determinations, the AER decided to transition to a trailing average approach, and set out its reasons for a transition, and the form of that transition.

In recent months, the AER has received proposals and submissions from various electricity and gas network service providers. These service providers agree with transitioning to a trailing average, but disagree with the form of transition that the AER has adopted. Generally, these service providers propose a 'hybrid' transition which combines a prevailing base rate with a historical debt risk premium (DRP).

The AER seeks expert advice on, and a review of, the material submitted by service providers on this topic. This advice will be an input into the AER's considerations on whether it should maintain its current position on transitioning to a trailing average approach, and the form of that transition.

In particular, the AER seeks:

- Advice on the efficient financing practices of a benchmark efficient entity under the previous 'on-the-day' approach, and therefore what the debt portfolio of a benchmark efficient entity would be at the start of the new regulatory period, along with what efficient financing practices a benchmark efficient entity would adopt under the AER's transition approach.
- Advice on the extent of any under or over recovery of borrowing costs experienced by a benchmark efficient entity in the circumstances of particular service providers under the previous on-the-day approach, and under the AER's transition approach.
- A review of information on the actual financing practices and costs of particular service providers, which may inform the answers to the above issues.

The specific questions the AER seeks advice on are listed below.

Efficient financing practices

➢ The AER considers an efficient financing practice of a benchmark efficient entity under the on-the-day approach would have been to borrow long term and stagger the borrowing so only a small proportion of the debt matured each year. The AER considers a benchmark efficient entity would have combined this practice with interest rate swap contracts to broadly match the base rate component of its actual return on debt to its return on debt allowance. Specifically, the AER considers an efficient financing practice would have been to:

- borrow long term (10 year) debt and stagger the borrowing so only a small proportion (around 10 per cent) of the debt matured each year
- borrow using floating rate debt, or borrow fixed rate debt and convert it to floating rate debt using fixed-to-floating interest rate swaps at the time of the debt issue, which extended for the term of the debt (10 years)
- enter into floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period, which extended for the term of the access arrangement period (typically five years).

At the end of the most recent regulatory period, and expecting the application of the AER's transition to the trailing average in the new regulatory period, the AER considers:

- a benchmark efficient entity would have a staggered debt portfolio with a floating rate exposure, and
- enter a series of 1 to 10 year floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period.

The AER does not necessarily consider all efficient service providers would have adopted precisely this strategy. However, the AER considers this is a reasonable approximation of the range of efficient financing practices that a benchmark efficient entity might have adopted under the on-the-day approach, and under the AER's transition to the trailing average.

1. Critically review the AER's position and reasons concerning efficient financing practices of a benchmark efficient entity. Review these practices both under the on-the-day approach and as a benchmark efficient entity transitions its financing arrangements under the AER's transition to a trailing average approach. In undertaking this review:
    a. Review potential variations to this approach that a benchmark efficient entity might have adopted and that could result in a debt portfolio with a higher return on debt—for example, some service providers have submitted analysis suggesting that it was optimal to hedge less than 100 per cent of the base rate. In particular, review the material from CEG on this topic.
    b. Review potential variations to this approach that a benchmark efficient entity might have adopted and that could result in a debt portfolio with a lower return on debt—for example, consider whether a benchmark efficient entity might have issued shorter term debt during the GFC and what implications this would have for the benchmark efficient entity's refinancing strategy. Alternatively, consider whether a benchmark efficient entity might refinance early to take advantage of the current lower interest rate environment.
    c. Advise on whether the AER's view on efficient financing practices are a reasonable approximation of the range of efficient financing practices a benchmark efficient entity might have adopted under the on-the-day approach, and under the AER's transition to the trailing average.

Historical under- or over recovery of borrowing costs and compensation for interest rate risk through the equity beta

➢ For the base rate component, the AER considers the allowed and actual return on debt of a benchmark efficient entity would have approximately matched in each regulatory period under the on-the-day approach. This match is possible because a benchmark efficient entity is and was able to hedge the base rate component of its debt portfolio under the on-the-day approach in order to reduce interest rate risk.

➢ For the debt risk premium component, the AER considers the allowed and actual return on debt of a benchmark efficient entity would usually have differed in each regulatory period. This is because of our understanding that the DRP component cannot be efficiently hedged to the allowed

debt risk premium. So, in some regulatory periods, the allowed debt risk premium would have exceeded the actual debt risk premium of a benchmark efficient entity. In other access arrangement periods, the allowed debt risk premium would have been less than the actual debt risk premium. Over a number of periods, these differences in the DRP component would be expected to approximately cancel each other out. Accordingly, under the on-the-day approach, we are satisfied that service providers have been fairly compensated for their efficient financing costs when considered over the life of the assets.

➢ Further, in determining the return on debt, the rules require the AER to have regard to the interrelationship between the return on equity and the return on debt. In considering these interrelationships, we observe that interest rate risk is a component of systematic risk. Further, we note that shareholders are compensated for systematic risk through the return on equity, and specifically the equity beta under the Sharpe-Linter CAPM. Accordingly, we consider a benchmark efficient entity was already compensated through the equity beta component of the return on equity for the risk of differences between the allowed and actual DRP. This is because the sample of privately owned service providers whose practices have informed our view of efficient financing practices, are largely also the same sample of service providers whose empirical equity beta estimates we have had primary regard to in estimating the equity beta. This position was supported by Lally.

➢ Thus, under the on-the-day approach, we are satisfied that service providers have been fairly compensated for their efficient financing costs in each and every regulatory period, in addition to when taking a life of the assets perspective.

2. Critically review the AER's position and reasons that over a number of regulatory periods, the differences in the allowed and actual DRP component (and any differences in the allowed and actual base rate) would be expected to approximately cancel each other out. In undertaking this review:

    a. Consider the particular circumstances of a benchmark efficient entity with the regulatory period timing of the Qld, SA and Victorian electricity distribution networks and ACT, SA and NT gas pipelines. In particular, review the material from the QTC and CEG on this topic.

    b. Advise on whether the application of the AER's transition to the trailing average leads to an outcome in which differences between the allowed and actual return on debt of a benchmark efficient entity would be expected to approximately cancel out over time.

3. Critically review the AER's position and reasons that the interest rate risk of differences between the allowed and actual DRP component of a benchmark efficient entity under the on-the-day approach, and the AER's transition to the trailing average, was and is compensated for through the equity beta component of the return on equity.

Review of response to information requests

The AER recently sent information requests to the privately owned service providers with current regulatory processes. These are the Victorian electricity distribution networks (AusNet Services, CitiPower, JEN, Powercor, and United Energy), the SA electricity distribution network (SA Power

Networks) and the SA gas distribution network (AGN). These information requests sought information on the actual financing practices and costs of those networks.

1. Critically review whether each response appears to answer the questions posed by the AER in an accurate and supported manner

2. Incorporate as appropriate the information from the responses in the consultant's advice on questions (1), (2) and (3) concerning the financing practices and costs of a benchmark efficient entity.

Note: Due to potential procedural fairness concerns over the use of this information, the consultant should first answer questions (1), (2) and (3) without reference to this information. And secondly advise whether consideration of this information reaffirms or changes the consultant's answers to questions (1), (2) and (3).

Note: These responses contain confidential information. To the extent the information is used in the public section of the consultant's report, the information must be used in an aggregated or generalised manner, or otherwise used in a way that does not disclose the specifics of the confidential information. Alternatively, confidential information should be used in a confidential appendix to the consultant's report—with a separated appendix used for each network. It is expected the consultant will need to work closely with AER staff in the presentation of the material in the consultant's report to ensure confidential information is not inadvertently disclosed.

To provide an indication of the type and level of detail from the responses, attached to this request for quote is the public (i.e. redacted) version of CitiPower's response. The full set of confidential responses will be provided to the consultant after a confidentiality deed is signed.

Merits and judicial review

The regulatory determinations made by the AER under the NER and NGR are subject to merits review by the Australian Competition Tribunal and judicial review in the Federal Court of Australia. Accordingly, the consultant's services and the consultant's final report must be performed to a professional standard which is robust, transparent, well-reasoned and defendable.

Any work required of the consultant as a result of a merits review would be the subject of a separate contract. The consultant may be requested to provide services in support of the final decision of the AER and the consultant must not unreasonably decline a request for assistance.

Selection Criteria

The AER will assess all quotes on a value for money basis in accordance with the Commonwealth Procurement Guidelines. These are available at:
<http://www.finance.gov.au/procurement/procurement-policy-and-guidance/CPG/division-1.html#value>

Selection will also be based on:

- technical competence to undertake the work
- previous experience in assessing network revenue determinations

- adequate resources to undertake the required work.

Information

Your response should:

- provide an estimate of the time and cost of providing the requested services. It is preferred that the consultant's fees be based on a schedule of hourly rates and will be subject to a cap agreed to by the AER.
- demonstrate the qualifications and relevant experience of the persons responsible for providing the requested services
- advise the AER of any known actual or perceived conflicts of interest
- demonstrate an understanding of the AER's requirements and the capability to provide the required outcomes in the specified timeframe.

Responses which do not include this information may not be considered any further.

AER conditions

The AER will only accept responses on the basis that you have:

- examined this RFQ, any documents referenced in this RFQ and any other information made available by the Commonwealth to tenders for the purpose of Quoting
- examined all further information which is obtainable by the making of reasonable inquiries relevant to the risks, contingencies, and other circumstances having an affect on their Quotation
- been satisfied by the correctness and sufficiency of the Quote including pricing structure.

In responding to this request for quotation, the respondent must acknowledge:

- they do not rely on any representation, letter, document or arrangement whether oral or in writing, or other conduct as adding to or amending these conditions other than amendments addenda issued by the AER
- they do not rely upon any warranty or representation made by, or on behalf of, the Commonwealth, except as are expressly provided for in this RFQ, but they have relied entirely upon their own inquiries and inspection in respect of the subject of their tender
- the AER shall not be responsible for any costs or expenses incurred by respondents in complying with the requirements of this RFQ
- neither these conditions nor the Quote give rise to contractual obligations between the AER and the respondent
- they are not to make public statements in relation to this Quote without prior written permission of the AER.

The AER does not guarantee, warrant or otherwise represent that any business, revenue or other benefit or any minimum volume or value of business, revenue or other benefit will be earned or received by any successful respondent.

The AER will decide on any further action after reviewing the responses to the RFQ. The AER reserves the right to:

a. vary the process and timetable relating to this process in its absolute discretion

b. vary the terms of the RFQ

c. cease the RFQ process

d. accept or reject any Quotes whether or not they are compliant

e. seek additional information or clarification from Respondents (including their sub-contractors or agents)

f. shortlist, select and negotiate with more than one Respondent

g. cancel, add to or amend the information, requirement, terms, procedures or processes set out in this RFQ

h. approach the market with an open Request for Tender (RFT) or seeking further Quotations via an Expressions of Interest (EOI).

APPENDIX B: AER DEBT QUESTIONNAIRE RESPONSES

The statements reported in the table below are the actual responses from NSPs. They are not Chairmont's views or interpretations.

Question 1: Historical borrowing costs and financial instruments -Please provide an estimate of actual weighted average portfolio cost of debt as at 30 June 2015. -Please provide details of debt instruments and other financial instruments included in this weighted average, using the spreadsheet attached to this request.

[Commercial-in-confidence—Text redacted]

Question 2: Comparison of debt portfolio against AER benchmark entity assumptions Please describe in which ways actual debt financing practices depart from the AER's assumptions underlying the benchmark efficient entity. Please specifically refer to assumptions that the benchmark firm: -Issues only AUD or foreign bonds (no bank debt) -Issues only 10 year BBB+ rated bonds -Refinances or raises approximately 10% of its debt portfolio every year -Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year In doing so, please refer specifically to evidence from particular debt and financial instruments in AGN's response to question 1.		
AGN	Issues only AUD or foreign bonds (no bank debt)	AGN finances its business on a consolidated basis with all debt being on a pari passu basis. AGN notes that its current cost of debt as at 30 June 2015 is 5.71%, which is above the recent benchmark cost of debt set by the AER for SA Power Networks of 4.35% and AGN's proposed cost of debt of 5.44%. AGN's debt portfolio is made up of:

		-Bank debt (both drawn and undrawn (approx. $350 million) -AUD bonds (over $1 billion) and -$US bonds (approx. $1.2 billion). The undrawn bank facilities referred to above were $227 million as at 30 June 2015. These facilities are maintained for liquidity purposes and to satisfy credit rating agency requirements, notably Standard & Poor's liquidity ratio.
	Issues only 10 year BBB+ rated bonds	As noted above, and as set out in the attached spreadsheet, AGN has bank debt and AUD and foreign bonds on issue. The term of bonds on issue ranges from 7 to 30 years (with the average being 15.9 years). Not all debt issued is rated. Debt that is rated reflects the rating at the time of issue, rather than being any reflection of the current credit rating of the business. AGN has corporate credit ratings from S&P and Moody's. These ratings are currently BBB+ stable and Baa1 stable, respectively.
	Refinances or raises approximately 10% of its debt portfolio every year	As reflected in the attached spreadsheet, AGN's debt profile is spread out with maturities (from now, not from issue) across the portfolio ranging from 2 to 26 years. AGN's Treasury Policy provides that the maturity profile of AGN's debt shall ensure that no more than one sixth of total debt is to mature in any financial year. In addition, refinancing arrangements for debt with a principal value greater than $50 million are to be committed at least six months prior to maturity date. Debt is also raised by AGN during the course of a year to meet annual capital expenditure needs.
	Under the 'on-the-day' approach, hedges 100% of its base rate using 5	Interest costs are AGN's largest single expense and AGN's Treasury Policy specifically recognises interest rate risk arising from interest rates moving higher than those used in the determination of the regulated revenue stream. The Treasury Policy puts in place objectives to manage that risk.

	year	AGN's Treasury Policy provides that to manage interest rate risk, AGN is to use interest rate swaps to fix between 80% and 100% of its floating rate debt (debt issued with a floating rate) broadly for a term that matches the regulatory period. AGN also maintains a fixed portion of the debt portfolio where interest rate exposure is not reset in this fashion (i.e. it is left fixed and not matched to a regulatory averaging period). As at 30 June 2015, the level of fixed/floating rate debt was 34%/66%. In this context, fixed rate debt issued in USD and then converted into floating rate AUD exposure using cross-currency swaps is included in the 66% floating rate exposure. The remaining 34% of the portfolio is fixed and the interest rates paid reflect an average of fixed rate borrowing undertaken since 2003. AGN has historically hedged between 80% and 100% of floating rate debt in accordance with the relevant regulatory averaging periods. Over the period from 30 June 2006 to 30 June 2015, the proportion of floating rate debt that has been hedged has ranged from 84% to 100% with an average of 90%.
AusNet	Issues only AUD or foreign bonds (no bank debt)	Predominantly issues AUD and foreign bonds for funding. Bank debt makes up a modest portion (generally less than 20%, currently 12%) of AusNet Services' debt portfolio. Bank debt facilities can be repaid and redrawn as required, with any undrawn amount under a facility subject to a commitment fee. AusNet Services maintains a limited amount of revolving bank debt to: a) Better manage its liquidity (e.g. proceeds from bond issues used to temporarily repay bank debt until funds are required) and b) Maintain ongoing relationships with banks. Banks are more willing to provide long-dated derivatives, such as cross currency and interest rate swaps, if they also have a lending relationship with the entity.
	Issues only 10 year BBB+ rated bonds	Mainly seeks to issue 10 year debt. This depends on market conditions. Of the 25 bonds listed in the spreadsheet; 6 had terms of between 7 and 12 years, 4 issues were 15 to 20 years and only 3 bond issues were for less than 7 years.
	Refinances or raises	Refinances roughly 10% of its total debt portfolio each year. This will vary slightly year to year according to the amount of historical debt issues that needs to be refinanced and funding required

	approximately 10% of its debt portfolio every year	for new capital expenditure.
	Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year	Hedges between 90% and 100% (generally closer to 100%) of its base rate using 5-year fixed interest rate swaps. It is prudent to be slightly below 100% given there is some degree of uncertainty of forecast earnings into the future and as a result debt levels maybe below forecast levels. AusNet Services also hedges the portion of the forecast capital expenditure which will be debt funded using forward starting interest rates swaps. These forward-starting swaps are also transacted at the time of the averaging period, and we incur a forward starting premium on these. Forecast debt is hedged because interest rates can fluctuate greatly over time – leaving it unhedged risks the actual cost of debt exceeding the regulated cost of debt allowance.
CitiPower and Powercor	Issues only AUD or foreign bonds (no bank debt)	We undertake financing using various instruments not restricted to only AUD or foreign bonds. Bank debt is also an essential part of our financing portfolio and is undertaken to provide support to short term bridging, revolving and working capital requirements.
	Issues only 10 year BBB+ rated bonds	Our current credit rating from S&P is BBB+. The rating was reduced from A- as a consequence of S&P's global rating review in December 2013.
	Refinances or raises approximately 10% of its debt portfolio every year	We raise our debt on a staggered basis but not 10% each year. Many capital market transactions require a critical mass volume and as such from time to time we have adjusted refinancing timing (delaying or bringing forward) in order to tap a larger debt raising. Other factors that influence the size of debt raising and refinancing are available pricing, tenor, age of existing assets, new capital expenditure requirements, diversification requirements, credit rating agency requirements and financial market condition at the time.

	Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year	Before the start of the 2011-15 regulatory control period we considered it prudent to hedge all our floating interest rate exposure due to the market uncertainty caused by the global financial crisis. We undertook our hedges in the same period used by the AER for determining our cost of capital. However, it is not necessary that we continue to undertake 100% hedging under alternate market conditions to those experienced during the financial crisis.
JEN	Issues only AUD or foreign bonds (no bank debt)	Importantly, since no debt is issued by JEN (refer to our response to question (1), the following section describes SGSPAA's (or the Group's) actual debt financing practices. These practices do not necessarily indicate what JEN would do if it operated on a standalone basis or otherwise did not benefit from the Group's centralised funding portfolio. Moreover, corporate history affected how the Group raised debt and its current debt portfolio. This history is not factored in to the AER's benchmark assumptions. For instance, following the acquisition in 2007 (where SPI acquired Jemena Group, the Group's 'inherited' capital structure was at the time fully bank debt funded, and split into different maturities. Over time, the Group's debt financing practices—in light of capital market or economic conditions—varied ([Commercial-in-confidence—Text redacted]). To answer the question, we carefully looked into the AER's assumptions underlying a benchmark efficient entity and SGSPAA's actual debt financing practices depart on the following: Funding portfolio while the Group issues a combination of bank debt and bonds (both in AUD and foreign currency), the AER benchmark only issues bonds. See Appendix A for the list of instruments, where the utilised/drawn amount as at 30 Jun 2015 was [c-i-c], made up of [c-i-c] per cent of bonds and [c-i-c] per cent of bank debt.
	Issues only 10 year BBB+ rated bonds	Credit rating—over time, the Group's credit rating (whilst fairly stable) is exposed to volatility and this is reflected in the pricing of bonds (which is not always BBB+). Note that the 'Rating' in Appendix A portrays the credit rating as at 30 Jun 2015, not the one at the execution time.

		Term—the tenors of the Group-issued bonds are dictated by the prevailing capital market conditions and conventions at time of issue, meaning the tenors fluctuate (ranging between [c-i-c] years for debt instruments as at 30 Jun 2015) and may not necessarily match the 10 year term assumed by the AER.
	Refinances or raises approximately 10% of its debt portfolio every year	Refinancing practices—the Group does not follow a fixed debt portion refinancing policy, in that debt refinancing depends on a range of factors such as forward looking maturity profile, operating and capital expenditure requirements, mix of regulated and non-regulated assets, credit rating liquidity requirements, distribution expectations to shareholders, capital market or economic conditions and hedging arrangements. Typically, the Group refinances between [c-i-c] per cent of its funding portfolio, with the most recent refinancing (in Jun 2014) accounting for approximately [c-i-c] per cent.
	Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year	Hedging portion—the Group's hedging strategy is to create a portfolio that includes a percentage of floating rate exposure and, for a portion of that floating rate exposure, to use pay fixed interest rate swaps in the manner envisioned in the above description of the 'benchmark' strategy. In this sense, The Group's strategy resembles that benchmark strategy, but only for a portion of its overall portfolio. As at 30 June 2015: – [c-i-c] % of the total debt portfolio was fixed using interest rate swaps in the manner envisioned in the above description of the "benchmark" – [c-i-c] % of the portfolio was fixed rate debt that had not been converted to floating rate exposure using interest rate swaps, and – [c-i-c] % (the residual) was floating rate exposure that had not been fixed using interest rate swaps.
SA Power Networks	Issues only AUD or foreign bonds (no	SAPN's debt financing practices are commercially based and driven by factors including but not limited to:

	bank debt)	Available markets i.e. post 2008/09 GFC limited markets were available and therefore debt financing was sourced from USPP. Also, some markets have minimum volume requirements, which may not suit refinancing requirements Execution certainty Pricing and available tenors
	Issues only 10 year BBB+ rated bonds	SAPN from time to time has held bank debt and also takes additional facilities to provide a bridge to bond issue and cash receipt. SAPN credit rating is A-/A3 and, accordingly, it does not issue BBB+ issued bonds. However we note that BBB+ is the basis of the AER's guideline. We note that this requires adjustments to be made when undertaking analysis and we also note that some debt has been sourced prior to the GFC with the debt 'credit wrapped' to AAA rating again making direct comparison difficult. Where debt has been credit wrapped, the bond insurer has agreed to meet interest and principal payments if the issuer cannot. In Australia, credit wrapping is primarily used by lower-rated (generally BBB) investment-grade corporates – typically airports, utilities and infrastructure related issuers – to obtain a higher rating on their bonds. This is because the rating of a credit-wrapped bond is generally set at the higher of the insurer or issuer's rating. However, it is important to note that in procuring credit wrapping, the bond issuer incurs certain costs payable to the bond insurer for the benefit of that guarantee. Accordingly the AER must either not include credit wrapped debt in determining the appropriate credit rating for the benchmark efficient business, or it must account for the effect of the credit wrapping, including the fees associated with procuring such guarantees.
	Refinances or raises approximately 10% of its debt portfolio every year	Rather than issue 10% percent of debt each year for a tenor of 10 years, SAPN adopted a multi-strategy approach involving debt issues that often differed from a 10% issue each year indeed with the 10% assumption often exceeded in certain years and less in other years and with different tenor adopted with a view to ensuring that there was an even spread of maturities in any year so as to reduce refinancing risk.

		However, given the new regulatory regime where 10% of the cost of debt is reset each year at prevailing 10 year rates, SAPN is endeavouring where practical to structure its debt portfolio over time to closely align with the new regime. However, debt financing will still be undertaken on a commercial basis and take into account prevailing market conditions. Treasury policies have been updated and approved by the Board reflecting the need to adjust financing practices with the move to a trailing average cost of debt for the determination of revenue allowances.
	Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year	In regard to hedging SAPN does align with the regulatory regime and therefore prior to the current regime did hedge a majority of existing floating rate debt at the start of the regulatory period using 5 year floating to fixed interest rate swaps at the same time as the averaging period. Under the new regulatory regime SAPN has undertaken hedging to closely align with the AER guideline of 1/10th of debt being reset each year.
United Energy	Issues only AUD or foreign bonds (no bank debt)	United Energy raises funding in both bond and bank debt markets. "Core term debt" is that which does not encompass the initial debt used to fund working capital and capital expenditure facilities. Generally, for core term debt requirements, the business makes an assessment at the time of borrowing based on pricing, tenor and the diversification of sources. The business will select A$ bank loans, A$ bonds or foreign currency bond markets. For shorter term debt, UE uses bank financing.
	Issues only 10 year BBB+ rated bonds	UE is rated BBB (stable) according to Standard and Poor's. The business issues debt across various tenors and currently has instruments in the portfolio that were originally issued across tenors from 3 years to 20 years. The current weighted average tenor at issuance of the debt portfolio (inclusive of subordinated debt) is approximately 9.6 years.
	Refinances or raises approximately 10% of its debt portfolio every year	UE refinances as required to fund upcoming maturities. Under the hybrid form of the transition to a trailing average, portfolio return on debt, the business is likely to develop a strategy for which the starting position is to refinance around 10% of the portfolio on an annual basis. This strategy will provide the business with the best method to minimise credit spread re-pricing risk (between the credit spread component of the return on debt, and actual credit spread expenses). We believe that such an approach is aspirational because RAB growth and market dynamics will mean that the business cannot stagger its debt issuance in a perfectly even and uniform fashion. Therefore, United Energy will still have to contend with a degree of credit spread re-pricing risk.

	Under the 'on-the-day' approach, hedges 100% of its base rate using 5 year	Under the 'on the day' approach, UE's strategy was to execute swaps that mature at the end of the regulatory reset period. The strategy was designed to ameliorate the mismatch risk between the base rate component of the cost of capital revenue allowance and the actual swap interest rate expense. The overall proportion of the debt portfolio that was hedged was certainly less than 100%. Under a trailing average rate of return on debt, and in the context of the transition to a trailing average, UE will take a different approach to the management of base interest rate risk. However, hedging will still consider the regulatory allowance for the return on capital, (WACC), rather than simply the rate of return on debt. See spreadsheet workbook and specifically the A$ interest rate swap transactions.

Question 3: Current debt raising strategy and change over time Please describe current debt raising strategy, including factors such as: -Risk management – refinancing risk, interest rate risk, and any other risk you consider relevant to the management of debt -Why you choose particular terms of issuance -Sources of debt (bonds, bank loan facilities, public/private debt offerings) -Nationality and currency of debt In this description, please address whether United Energy's debt raising strategy has been relatively stable over time or has varied in response to factors such as: diversification of debt instruments and maturities, liquidity management, changes in the aggregate capital required as new investments are made contributing to growth in the Regulatory Asset Base and as aging assets are depreciated, credit metrics, and market conditions, including access to foreign and domestic markets and the ability to hedge interest rate movements.		
AGN	Risk Management	AGN's debt raising strategy, including the management of refinancing risk, interest rate risk and foreign currency risk are governed by AGN's Treasury Policy. That Treasury Policy is reviewed and re-approved by the Board each year, but it has not changed materially over time. The Treasury Policy will be reviewed and updated following the AER decision for South Australia to reflect the move to a trailing average cost of debt allowance. In relation to refinancing risk, as noted above this is managed through a range of initiatives, the primary ones being a requirement to refinance no more than one sixth of the debt portfolio in any one year and arranging refinancing for debt with a principal value great than $50 million at least 6 months prior to the maturity date. To mitigate counterparty risk, bank debt cannot exceed half of the total committed facilities for the group. Interest rate risk is fundamentally managed through the company's reliance on floating rate debt along with the use of interest rate swaps. Interest rate swaps are used to fix 80% to 100% of floating rate exposure broadly for a term matching the length of the relevant regulatory period. Foreign currency risk is mitigated by the requirement contained in the Treasury Policy to maintain

		100% hedging of foreign exchange rate risk associated with non-Australian dollar denominated debt to protect the cash-flows of the business.
	Choosing Issuance Terms	AGN's historic practice has been to balance the lowest cost of debt issuance with the need to extend the maturity profile of the debt portfolio. The extension of the maturity profile is associated with the management of refinancing risk, which is expressly addressed in the Treasury Policy, notably the requirement to have no more than one sixth of total debt maturing in any financial year.
	Sources of Debt	There has been no recent variation in AGN's debt management strategy due to market conditions.
AusNet	Risk Management	AusNet Services' risk management approach has remained constant over a long period of time (that is, at least since listing in December 2005). Please see Notes 17 and 19, and the Director's Report sections (i) and (ii) of AusNet Services' 2015 Annual Report (Attachment C) and AusNet Services' Medium Term Note Programme document (Attachment D) for a comprehensive description of AusNet Services' Financial Risk Management activities. The following additional points are provided to supplement this information: AusNet Services does not take views on interest rates, and hence hedges its interest rate risk (including the forecast debt funding component of future capex) in line with the averaging period. AusNet Services does not retire bonds before maturity. Retiring bonds before maturity is especially problematic where foreign currency bonds have associated cross currency swaps. Closing out these cross currency swaps may have significant accounting and tax consequences. It is a requirement by the credit rating agencies to refinance any maturing debt at least 6 to 9 months (and preferably 12 months) in advance of the maturity. AusNet Services utilises its bank debt facilities to manage this refinancing requirement by the credit rating agencies. As a result, proceeds from a bond issue can be used to repay revolving bank debt facilities and then the bank debt facility can be re-drawn at the time of the maturity to repay the bond. The cost of keeping undrawn but committed bank debt facilities is the commitment fee payable on the facilities, [Commercial-in-confidence—Text redacted] . This cost is necessary given the credit rating consequences of not having funding in place well before maturity of the bonds.

CitiPower and Powercor	Risk Management	Our debt raising strategies are not static. Just as the financial markets are ever changing so is our funding strategy. The company monitors financial market activity, issuing levels and comparative pricing across a range of funding options and tenors. A holistic view to managing the debt portfolio is taken and constant monitoring of the refinancing, interest and currency rates and counterparty credit risks are carried out. Generally we will put in place committed funding six months ahead of each maturity to meet the expectations of the rating agencies. In determining our debt raising and refinancing options we give due consideration to pricing (domestic and foreign), size availability, term, source of funding and liquidity and credit metrics requirements. Sometimes we would utilise transitional type funding with the view to 'bridging' to a longer tenor capital markets transaction when timing is deemed appropriate. A decision to hedge and at what percentage is made closer to the regulatory reset period in question taking into consideration many aspects including but limited to market conditions, counterparty credit limits, future debt raising considerations and financial market condition expectations.
	Choosing Issuance Terms	All of the factors discussed above will play a role in the final determination of what ultimately is issued by the company at any point in time. We believe that diversification of securities and tenors allows for mitigation of financing risks. Long term funding is essential for an infrastructure utility like us in regards to replacing the ageing network and non-network assets and to provide new long life assets. Similarly, short term loan facilities are also important to meet the day to day working capital, liquidity and bridging capital requirements.
	Sources of Debt	The current sources of debt are provided in sheet 'Debt instruments' of 'AER Attachment - Debt information request template – CitiPower.xlsx' The current sources of debt are provided in sheet 'Debt instruments' of 'AER Attachment - Debt information request template –Powercor.xlsx'

	Nationality of Debt	Provided in sheet 'Debt instruments' of 'AER Attachment - Debt information request template – CitiPower.xlsx' Provided in sheet 'Debt instruments' of 'AER Attachment - Debt information request template – Powercor.xlsx'
JEN	Risk Management	Importantly, since no debt is issued by JEN (refer to our response to question 1), the following section describes SGSPAA's (or the Group's) actual debt raising strategy. This strategy may not reflect that strategy that JEN would adopt if it operated on a standalone basis or otherwise did not benefit from the Group's centralised funding portfolio. To mitigate any risk exposure in relation to debt raising, the Group has in place a range of Board-approved policies on managing interest rate, refinancing, and liquidity risks. These policies are reviewed annually and important inputs into the Group's debt raising strategy. Significant new operational risks arising from disruptive technologies—such as solar power, battery storage, smart meters and the user-friendly service innovations that stem from these technologies—are prompting changes to how energy networks are run (and funded). For the first time in a century, the combined effect of these developments is throwing into doubt the scale, design, direction of growth and longevity of electricity network investments. Interest rate risk is the risk that the Group faces a financial loss due to adverse movements in interest rates. [Commercial-in-confidence—Text redacted]. As discussed below, the Group manages interest rate exposure, especially for the regulated assets, using interest rate swaps and other hedging instruments. How the Group manages interest rate risk depend on the interest rate structure (i.e. fixed vs. floating rate) and the nature of assets (i.e. regulated vs. unregulated). Refinancing risk is the risk that the Group is limited (fully or partially) from accessing financial markets in a timely manner or does so on unfavourable terms. Negative impacts may include: -Higher funding and issuance costs

		-Restrictive covenants—e.g. limit ability to pursue growth plans, increased vulnerability to adverse economic and industry conditions and limit flexibility to plan or react to business and industry changes, or -Inability to refinance—-which may prompt default of existing debt. The Group's aims to manage refinancing costs, ensure optimal financial flexibility, arrange and structure funding for the Group's general corporate purposes, and fund investment in assets and projects, while monitoring refinancing risks. Liquidity risk is the risk that the Group faces an unknown or unreasonably foreseeable event that means it cannot pay debt holders when required. The Group manages this risk by [Commercial-in-confidence—Text redacted] Investment grade credit ratings provide the Group with the capability to access domestic and international debt markets at competitive credit margins. These ratings are subject to revision, suspension or withdrawal at any time—and any downgrade could harm the Group's ability to obtain financing. The Group manages this risk by maintaining a strong financial position that supports its credit rating. For instance, the Group targets credit metrics [Commercial-in-confidence—Text redacted]. The Group does this by establishing strong and transparent relationships with recognised rating agencies and ensuring investment and other corporate decisions are made after considering the impact on these metrics. [Commercial-in-confidence—Text redacted]
	Choosing Issuance Terms	When deciding how much debt to raise, when, where (i.e. which markets) and for how long, the Group considers several factors including (but not limited to): Expenditure requirements—to maintain and operate its various investments, including to provide reliable and safe electricity distribution to JEN's customers Risk management practices—primarily to mitigate any refinancing risk, interest rate risk or liquidity

		risk faced at the Group level External credit ratings and distribution expectations—credit rating agencies and holders of Group debt impose strict debt covenants and credit metrics to maintain the Group's credit rating, while shareholders invest in the business and expect to receive a level of distributions and earn a level of profitability, Debt maturity profile—to ensure that the Group's existing debt portfolio is refinanced when it matures, while seeking to spread this portfolio over maturities out to ten years with a bias towards longer maturities at issuance. Capital market or economic conditions—access to foreign/domestic markets and their typical conventions or other economic indicators. Asset expenditure requirements across the Group are a key factor in determining how much and when the Group seeks to raise fund. The Group owns multiple energy networks, including JEN and Jemena Gas Networks (JGN), and these networks are capital intensive with long lived assets, therefore a key aspect of the Group's debt raising strategy is how to appropriately and strategically fund its capital requirements, while mitigating or managing the relevant risks. These capital requirements—in addition to network operating and maintenance expenditure—are usually lumpy in nature, depending on a range of factors such as the remaining asset lives of its network, condition of its assets, current and expected demand load requirements from network users and non-network related expenditure such as information systems or fleet management. Asset expenditure requirements across the Group are a key factor in determining how much and when the Group seeks to raise fund. The Group must also manage rolling over of existing debt and funding working capital requirements. The amount of undrawn committed facilities in the Group portfolio at any point in time must be sufficient to cover [Commercial-in-confidence—Text redacted] The Group's forward looking debt maturity profile of its portfolio is another key factor in determining how much and when the Group seeks to raise funds.

		The Group seeks to [Commercial-in-confidence—Text redacted] The prevailing capital market or economic conditions are key to determining where and for how long to raise funds. With the timing of debt raising being fairly volatile, the Group also considers the prevailing capital market or economic conditions at the time of issue. These conditions include: how easy it is to access to foreign or domestic capital markets. Over time, the Group's debt raising strategy has been fairly stable, except for the period immediately following the global financial crisis and the change of the Group's corporate history (with two acquisitions since 2007). The Group has [Commercial-in-confidence—Text redacted].
SA Power Networks	Risk Management and Choosing Issuance Terms	As mentioned in Question 2, SAPN's debt financing practices are commercially based and driven by factors including but not limited to: Available markets i.e. post 2008/09 GFC limited markets were available and therefore debt financing was sourced from USPP. Also, some markets have minimum volume requirements, which may not suit refinancing requirements SAPN's debt raising strategy has been relatively stable over time but certainly takes into account: execution certainty, pricing, and available tenors Diversification of debt instruments and maturities – SAPN for instance will take into account the amount of debt issued into a particular market so as to avoid not having diversity for future debt issues. SAPN also diversifies debt instruments where practical unless it is not commercially sound to do so. As stated previously, SAPN will endeavour to structure its debt portfolio over time to closely align with the new regulatory regime, which will require diversification of maturities, but again only if commercially sound to do so. SAPN certainly tries to avoid having too much debt maturing in any one year so as to reduce refinancing risk; Liquidity management – SAPN has generally maintained access to cash advance facilities for the purposes of liquidity management. If these facilities become drawn towards capacity on a recurring basis SAPN will generally seek medium term debt to repay these facilities. In addition, for

		refinancing, SAPN will generally have committed funding in place 3-6 months prior to the date that debt matures; Changes in the aggregate capital required as new investments are made contributing to growth in the Regulatory Asset Base and as aging assets are depreciated – SAPN will raise additional debt as required in addition to internally generated cash flow to fund RAB growth; Credit metrics – SAPN is very conscious of credit metrics and when considering debt raising will always endeavour wherever possible to maintain required metrics. Market conditions, including access to foreign and domestic markets and the ability to hedge interest rate movements – SAPN has strong relationships with multiple bank counterparties and is therefore always aware of and being kept updated on market conditions and access.
United Energy	Risk Management	The primary aim of the funding strategy is to maintain enduring access to funding markets at the lowest possible price with appropriate levels of diversification. To achieve this aim, the business considers (amongst other things) refinancing risk, interest rate risk, credit spread risk, basis risk and also foreign currency risk. Refinancing risk: The business manages refinancing risk by retaining access to various markets globally so as to ensure that liquidity is available under all market scenarios. In addition, we stagger our maturities so as to avoid concentration in any particular year, and then aim to refinance maturing debt 6 to 12 months prior to maturity. Interest rate risk: The business manages interest rate risk by executing interest rate swaps that hedge the exposure of the business to movements in market interest rates. The business does not actively trade base interest rates. Credit spread risk: Financial instruments are not available to hedge this risk and so the company remains largely exposed to the risk. The risk can be partially mitigated by aligning debt raising with the timing assumptions that are inherent to the ten year trailing average, however commercial realties mean that the benchmark strategy cannot be matched on a like for like basis. We do believe, however, that the ten year trailing average reduces this risk by comparison with the on the day approach to measuring the rate of return on debt.

		Basis risk: When a debt instrument is issued in a foreign currency, the business is required to swap the proceeds of the debt-raising back into Australian dollars using an Australian dollar basis swap (the basis swap is the underlying instrument which transforms, say, a 3month US dollar LIBOR rate into a floating, Australian dollar 3-month bank bill swap rate, A$ 3m floating BBSW). The transaction is executed in the foreign currency basis swap markets. Movements in these markets will have an impact on the overall cost of the debt to the business in Australian dollars. Foreign currency risk: If the business accesses debt in a foreign currency, then it is exposed to movements in the respective foreign currency against the Australian dollar (A$), for both principal and interest payments. The business hedges this risk when it borrows debt in a foreign currency by entering into cross currency swaps.
	Choosing Issuance Terms	Price versus tenor versus refinancing risk considerations.
	Sources of Debt	Purpose of facility versus price, versus tenor, versus refinancing risk, versus diversification considerations.
	Nationality of Debt	UE is agnostic to the nationality and currency of debt issued. The business, however, aspires to raise funds in Australian dollar markets given that the business is located in Australia and receives all of its revenue in A$. UE believes that it is beneficial for the business to access local banks and bond investors, however in view of the size of the regulatory asset base for UE, the business does not believe that the pool of funds available in Australia at a competitive price is large enough to rely on.
	Overall	UE's debt raising strategy has been relatively consistent over time as the primary aim has been to maintain enduring access to funding markets at the lowest possible price with appropriate levels of diversification. The tactical execution strategy for each debt capital raising however, will change in response to the factors discussed below. Specific detail around consideration of the factors is provided below. UE has consistently monitored markets globally. The ultimate choice of product and market has been a function of price, tenor and diversification at the specific time. UE has consistently managed the business with a liquidity buffer. The current liquidity buffer is

		$70m, however we consider that this a minimum and generally hold liquidity in excess of the minimum. We do aim however to minimise excess liquidity where appropriate in order to reduce carry costs. UE funds investment in the regulatory asset base, (RAB), via a combination of bank debt facilities, free cash flow and equity. The bank debt facilities are generally sized to fund three years of planned capital spending and are then 'termed out' into longer tenor debt. A new bank debt facility is then put in place. As UE's rate of investment in the RAB is generally reasonably consistent, the implication is that the process described above can apply over the course of time. UE's tactical funding strategy will vary so as to manage to credit ratings and, by extension, to the requirements of the Ratings Agencies. The United Energy board of directors has a risk appetite statement that seeks to maintain a credit rating of BBB (stable). The funding strategy is designed around the risk appetite statement. UE's tactical funding strategy varies in response to market conditions.

Question 4: More detailed explanation of interest rate management Please describe the overall strategies underlying use of financial instruments to manage interest rate risk. In particular, please address factors such as: -The extent to which hedging instruments are used to match the benchmark return on debt set in the AER's decisions -Whether and how you balance interest rate risk management against opportunities presented by favourable market conditions -Whether you retire debt on issue prior to maturity and which factors influence this decision -Whether you are subject to internal policies or debt covenants which require a specific proportion of its base rate exposure to be hedged -To what extent you have been able to manage interest rate risk from the debt risk premium.		
AGN	Use of Hedging Instruments	AGN uses hedging instruments to manage volatility in its net cash-flows. A significant source of volatility in revenues has been due to variability in the allowed return on capital (both equity and debt) to reflect prevailing interest rates around the beginning of the regulatory period. The impact of this volatility on cash-flows can be, to some extent, managed by creating offsetting volatility in financing costs. AGN's approach to doing so has been to maintain a mix of fixed rate and floating rate debt and to use interest rate swaps to periodically reset between 80 and 100% of the floating rate debt. See response to question 2 above.
	Interest Rate Risk with Favourable Market Conditions	AGN must operate within the parameters of its Treasury Policy relating to hedging as described above – ie to hedge 80% to 100% of floating rate debt.
	Retiring Debt Prior to Maturity	AGN has only retired debt prior to maturity twice in the past 10 years. Debt is generally retired at market value and not book value, and therefore a premium has to be paid to retire expensive debt prior to maturity. In 2006, $200 million of capital indexed bonds were redeemed prior to maturity due to a favourable refinancing opportunity. In 2013, $50 million in capital indexed bonds redeemed prior to maturity.

	Internal Policies and Debt Covenants	Both AGN's Treasury Policy and the company's major financing document requires floating rate debt to be fixed at the levels as set out above
	Managing Interest Rate Risk from Debt Risk Premium	Unlike the base rate of interest paid on floating rate debt, there is no financial market derivative that allows the debt risk premium paid by AGN to be periodically reset. In this context, AGN manages overall interest rate risk (associated with movements in both the base rate of interest and the debt risk premium) in the manner already described. Specifically, by maintaining a mix of fixed rate and floating rate debt and using interest rate swaps to periodically reset between 80 and 100% of the floating rate debt. See response to question 2 above.
AusNet		See answer to Question 3 above.
CitiPower and Powercor	Use of Hedging Instruments	We chose to hedge swap rate component of the return on debt in the past as a means of better matching interest costs with revenues. During 2010 in light of the global financial crisis this was certainly deemed the best practice to mitigate any interest rate risk at that time. However, we are unable to hedge the debt margins over swap rate. It is important to note that the current hedging instruments are the swap rates. There is a fluctuating basis between swap rate, the risk free government bond rate and the AER Benchmark. As such the hedging that we have transacted is not able to fully hedge the entire AER benchmark. In terms of tenor we have previously transacted 5 year swaps to match the regulatory reset period at that time. Another point to note is that the current benchmarks that the AER have identified are compiled using secondary market data. This does not represent the new issue rate that a corporate would pay. Some bonds issued by us (for example the USPP) in the past are not publicly tradeable and so it is not possible to observe the new issue premium. However, such a premium can be estimated using other market based studies.
	Interest Rate Risk with Favourable Market Conditions	We don't look at interest rate risk management in isolation to refinancing risk management. The two go hand in hand and we have to take a balanced view of optimal pricing and tenor.

		Treasury management is very dynamic and we have to consider the timing of debt raising and refinancing based on our capital needs and market opportunities. For example a reduction in the financing bank costs resulted in us repaying early (and terminating) a revolving bank debt facility and refinancing with a new bank bridge facility at lower prevailing interest costs. As this facility is short term it is expected to be replaced with a longer tenor capital markets transaction at some time in 2016.
	Retiring Debt Prior to Maturity	We do not retire debt early but we do arrange committed funding six months ahead of each maturity.
	Internal Policies and Debt Covenants	We do have an internal treasury policy that is commercially flexible and subject to change from time to time based on market conditions, risk appetite of the business and how the return on debt allowance is set. Our existing treasury policy was based on an uncertain environment prevailing at the time of last price review. It is not certain whether the business
	Managing Interest Rate Risk from Debt Risk Premium	There is no practical way we could hedge the debt risk premium portion of cost of debt.
JEN	Use of Hedging Instruments	[Commercial-in-confidence—Text redacted]
	Interest Rate Risk with Favourable Market Conditions	As discussed in response to question 2, the Group manages interest rate exposure—especially for the regulated assets— [Commercial-in-confidence—Text redacted]. Key financial instruments entered by the Group for this purpose are listed in the 'financial instruments' sheet within Appendix A. The Group's interest rate risk practice is [Commercial-in-confidence—Text redacted]. The notional debt allocated to JEN is $ [c-i-c] m ($nominal) as at 30 June 2015, see our response to question 1.

		Finally, the Group typically does not [Commercial-in-confidence—Text redacted]
SA Power Networks	Use of Hedging Instruments	As mentioned previously, SAPN does hedge it's interest rate risk exposures to align with the AER's approach to setting the cost of capital allowance. SAPN notes that this hedging strategy is equally applicable to the risk free rate component of the benchmark return on equity set in the AER's decisions as it is to the benchmark return on debt.
	Interest Rate Risk with Favourable Market Conditions	SAPN does not engage in speculative opportunities even if current market conditions appear favourable. This is prohibited by Policy. As already discussed, SAPN does hedge it's debt to match the benchmark return on debt set out in the AER's decision.
	Retiring Debt Prior to Maturity	SAPN generally does not retire debt on issue prior to maturity. SAPN has only once retired debt prior to maturity, which was due to a favourable proposal by an agent involved with a debt issue to repay maturing debt that had a holding of the debt that was being repaid.
	Internal Policies and Debt Covenants	SAPN does have internal policies which regulate hedging and require that SAPN align with the basis of the AER's approach for setting the cost of capital. SAPN does not have any debt covenants that require a specific proportion of its base rate exposure be hedged.
	Managing Interest Rate Risk from Debt Risk Premium	SAPN has managed interest rate risk separately from debt risk premium risk. Interest rate risk has been managed so as to align as closely as possible with the regulatory methodology for setting cost of capital allowances through the use of hedging instruments. Debt risk premium risk has been managed so as to reduce as far as is considered commercially appropriate, refinancing risk.
United Energy	Use of Hedging Instruments	UE's hedging strategy is specifically designed to minimize overall cash-flow volatility by aligning net fina expenditures (on debt, derivatives and equity) with the AER benchmark rate of return on capital. This been designed to manage interest rate risk, and to therefore insulate the profit and loss account from financial markets.
	Interest Rate Risk	UE does not actively trade base interest rates, but rather uses base interest rate, risk management

	with Favourable Market Conditions	techniques to minimize the exposure of the business to movements in interest rate markets.
	Retiring Debt Prior to Maturity	The Ratings Agencies generally require UE to refinance debt approximately six months prior to maturity. Where possible, UE will retire debt early if the cost is not prohibitive. Generally speaking, bank debt can be retired early without break costs (however this is not always the case). Conversely, bonds cannot usually be retired early without material break costs (however this is also not always the case as some bond instruments permit a par call' prior to maturity).
	Internal Policies and Debt Covenants	United Energy has covenants in place with its lenders. There is a common terms deed poll which also incorporates a short schedule that describes the firm's hedging policy (for interest rates and foreign exchange). The section of the schedule on interest rate hedging reads as follows: *All interest rate hedge transactions must be linked at all times to the Borrower's underlying floating interest rate exposures and may not exceed in total at any time 100% of the actual floating interest rate exposure under the Senior Debt Facilities (excluding the Working Capital Facility and Hedging Facilities) during the period to which they relate. On and from Financial Close, the Borrower must enter into and maintain interest rate hedging in an amount equal to or greater than 80% of the floating interest rate exposure on drawings under the Senior Debt Facilities (excluding the Working Capital Facility and Hedging Facilities).* *For the avoidance of doubt, nothing in this clause requires interest rate hedging in an amount greater than 80% of the floating interest rate exposure. In each case the minimum amount required to be hedged will be reduced by the principal amount of any fixed interest debt securities issued by the Borrower and by the amount of cash on deposit at that time in the name of a Transaction Party with an "ADI" for the purposes of the Banking Act 1959 (Cwlth).* The key points to be inferred from the stated hedging policy are that: • There are no clauses which refer specifically to interest rate swaps (or pay-fixed, receive-floating swaps). • There is no obligation placed on United Energy to hedge the base rate component of the cost of debt to the return on debt allowance.. • There is no terminology about the "fixing" of base interest rates as such. Instead, hedging is in

		respect of the underlying floating interest rate exposure. Furthermore, the hedging proportion that is mentioned (80%) is for senior debt. Thus, floating rate exposures for sub-ordinated debt do not need to be hedged. When considering the total debt portfolio, the overall proportion that is hedged is likely to be less than 80%. • Moreover, the obligations about hedging do not affect fixed interest debt securities issued in the domestic currency. There is no requirement for UE to hedge fixed rate debt that has been issued in Australian dollars.
	Managing Interest Rate Risk from Debt Risk Premium	The question should refer to credit spread risks resulting from the debt risk premium rather than "interest rate risk". The business is not currently aware of any practical means for using financial instruments to manage risk associated with the debt risk premium. The only way in which to manage this risk is for the business to attempt to replicate the issuance profile that has been assumed for the benchmark efficient entity that underpins the calculation of the return on capital allowance. Under the rate-on-the day approach, the business would literally need to refinance all of its debt during an averaging period. Since such an undertaking was not commercially practicable, the business was obliged to absorb risk associated with the debt risk premium. We believe that the move to the trailing average will partially mitigate the credit spread risks.

Question 5: Relationship with corporate group

Please describe how interest costs and the costs of financial instruments are allocated to your regulated services within its corporate group. Specifically, please outline:

-Which corporate entity is responsible for raising debt relevant to funding the provision of your reference services

-Whether debt raising is done collectively for the corporate group, or for individual corporate entities within that group

- If debt is raised collectively, how the costs of particular instruments are allocated to individual corporate entities within the group (i.e. how debt margins and total debt costs are set for individual entities where debt has been raised collectively) or if debt is raised from a related entity, how the debt margins and total debt costs are set.

AGN	Responsible Corporate Entity	AGN manages its debt on a consolidated group basis. The Group issues debt out of two subsidiaries, AGN Ltd and AGN (Vic 3) Pty Ltd. AGN consolidated its debt packages of Envestra Ltd and Envestra Victoria Pty Ltd (now called the above names) in 2009, following approval from financiers. All debt is pari passu under the Inter Creditor Deed Poll, regardless of the issuing entity, and therefore AGN Group is a single credit.
	Collective or Individual	See answer above.
	Allocating and Setting Costs	Costs are not allocated to the individual corporate entities for the reasons described earlier.
AusNet		Attachment C: Directors' Report sections (i) Capital Management and (ii) Material Risks and uncertainties; and note 1: (L) Derivative financial instruments, (Q) Borrowings and (R) Net Finance costs. Also, Note 17 and Note 19 Attachment D, Section 'Business of the AusNet Services Group', sub-sections: Structure of the AusNet Services Group and the Stapled Entity; and Sources and Uses of Liquidity
CitiPower and Powercor	Responsible Corporate Entity	Victoria Power Network (VPN) is responsible for the financing of its subsidiaries. All regulated assets of VPN are held in the CitiPower and Powercor regulated entities. Due to legacy issues, CitiPower 's debt is largely held in CitiPower 1 Pty Ltd, with remaining debt held in VPN.
	Collective or Individual	Some debt is raised separately for CitiPower and some collectively for VPN group.
	Allocating and Setting Costs	Debt held in VPN has been allocated between CitiPower and Powercor approximately in proportion to their RAB. Debt margins and total debt costs are set at market rates.
JEN	Responsible	Consistent with our response to question 1, the Group funds its operations utilising a centralised

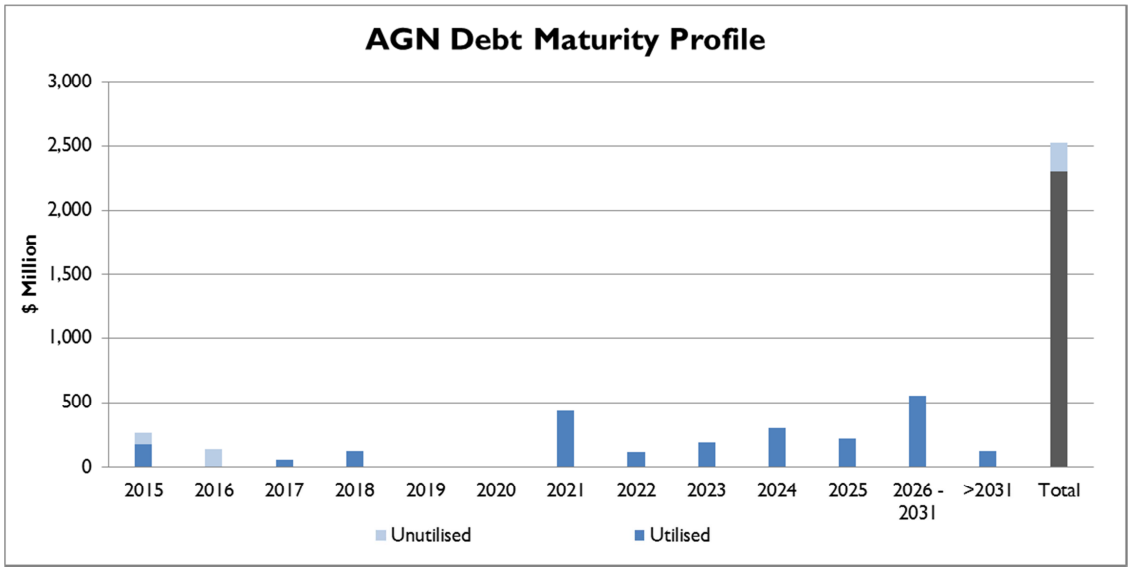
	Corporate Entity	funding portfolio—which means all external funds are raised by a single entity to invest in the various group assets. We do not allocate the costs of these funds to individual assets within the group.
	Collective or Individual	Any debt raising is carried out collectively at the Group level—through SGSPAA—with the exception of a few legacy bonds which were issued under Jemena Ltd (previously The Australian Gas Light Ltd).
	Allocating and Setting Costs	To determine JEN's specific cost of debt, we made adjustments and/or assumptions to the estimate Group cost of debt. Appendix A provides the underlying assumptions and relevant workings. We also assumed that the cost to fund JEN's SCS activities is the same as JEN's cost of debt (on a stand-alone basis)—see Box 1 for more detail on our calculation method. We confirm that no debt is raised by a related entity apart from SGSPAA or Jemena Ltd to fund investment in JEN's network
SA Power Networks	Responsible Corporate Entity	SAPN is a partnership and all debt is raised through ETSA Utilities Finance Pty Ltd, an entity whose sole focus is the raising of debt and provision to the partnership.
	Collective or Individual	As above.
	Allocating and Setting Costs	Not applicable. The Debt raised is fully costed to SAPN.
United Energy	Responsible Corporate Entity	United Energy Distribution Pty Ltd is the borrower for all senior debt of the United Energy Group (and therefore for the provision of standard control services).
	Collective or Individual	As UE is a single purpose entity, all debt raising is for the entities within the group.
	Allocating and Setting Costs	United Energy Distribution Pty Ltd is the asset owner and licensed entity as well as the borrower for all senior debt of the United Energy Group. The other United Energy Group companies (other than UE & Multinet Pty Ltd (UEM)) are guarantors under all of the senior debt facilities entered into

		by UED. In practice, therefore, costs are not allocated to individual entities but are instead contained within United Energy Distribution Pty Ltd.

APPENDIX C: HARMONISED SPREADSHEET INFORMATION

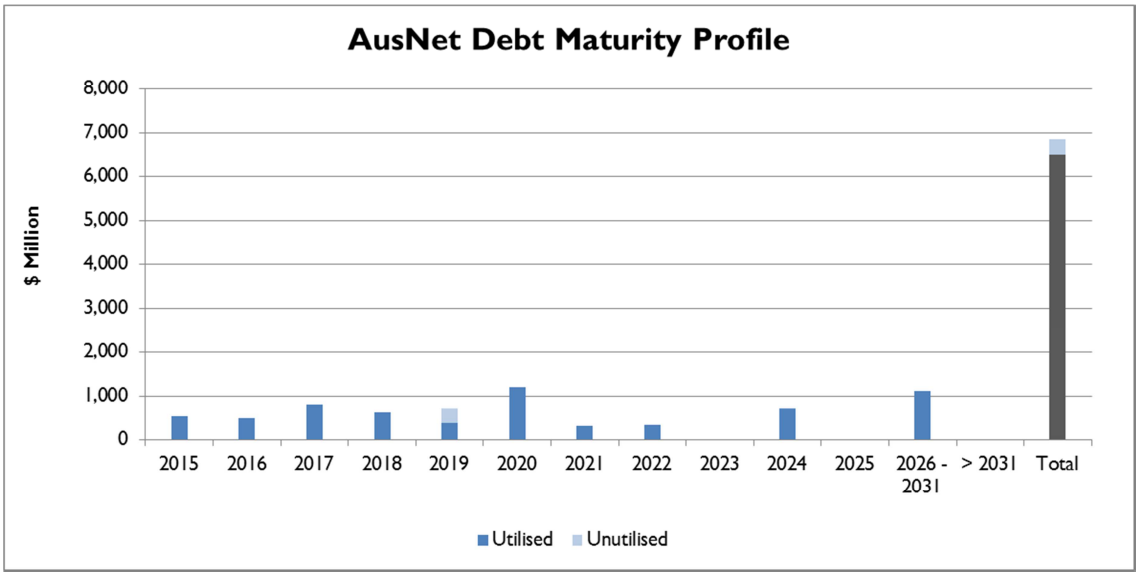
Debt Maturity Profiles

Each of the company's current debt profiles are presented and critiqued below. The graphs show the amount maturing in each calendar year, regardless of the type of debt and whether it is fixed or floating rate.



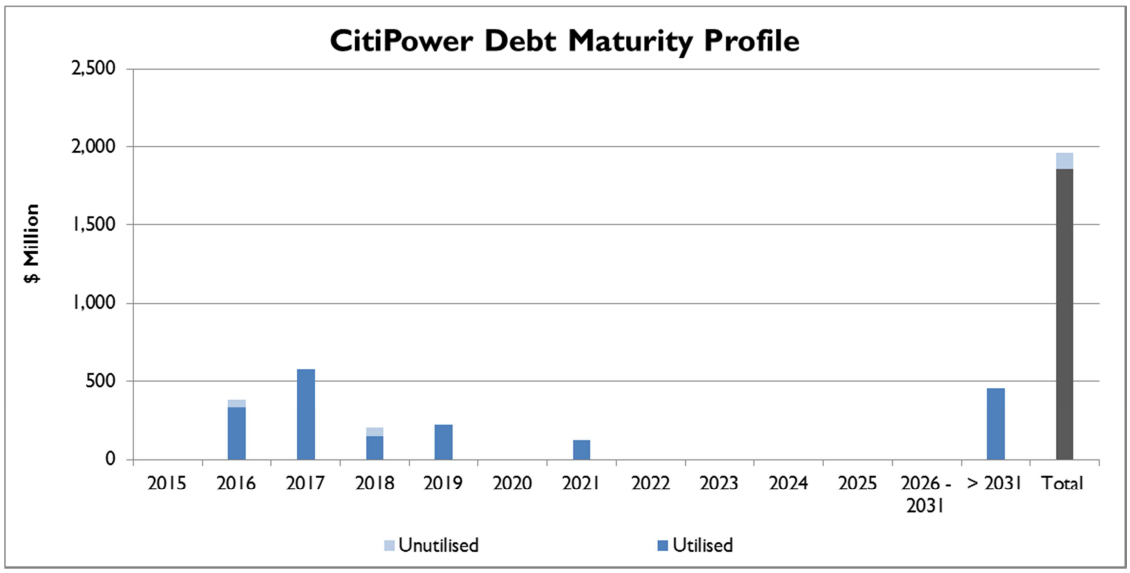
Graph 7: AGN Debt Maturity Profile

Graph 7 indicates that AGN has a well staggered maturity profile with greater emphasis on slightly longer term debt. The unutilised short-term portion is typical for stand-by liquidity needs. The very long term portion beyond 15 years is subordinated debt.



Graph 8: AusNet Debt Maturity Profile

AusNet in Graph 8 records an even smoother staggered profile than AGN and clearly within the expectations of EFP. Note that the figures from AusNet appear to be for the group, whereas in the later section they only report on the basis of the electricity distribution business.



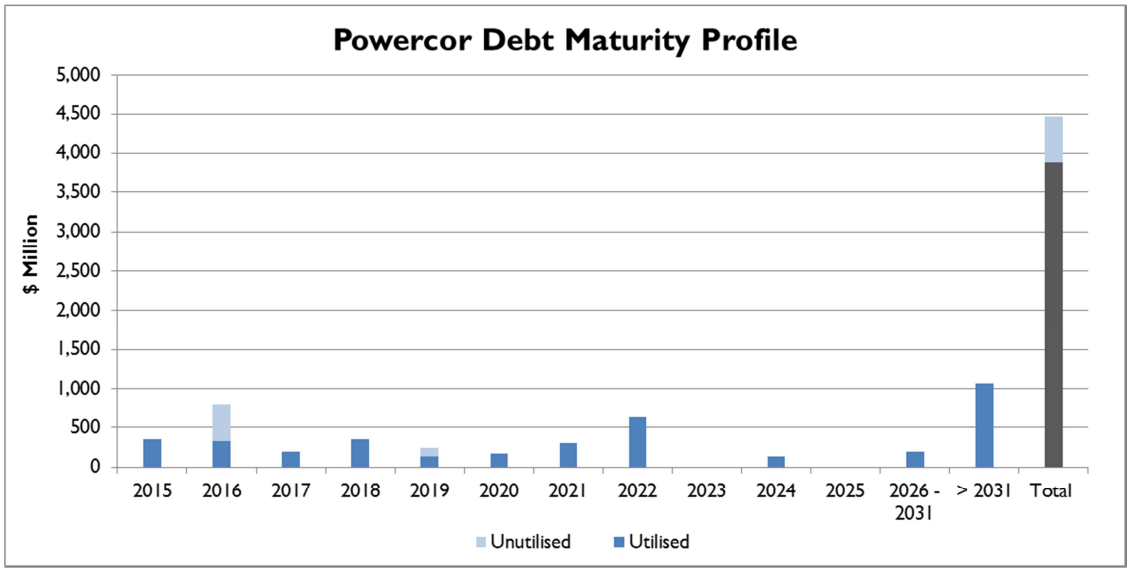
Graph 9: CitiPower Debt Maturity Profile

Graph 9's depiction of the CitiPower profile highlights a somewhat different approach to debt structuring, most likely made possible by the group structure to which CitiPower belongs. It uses a 'bar-bell' maturity profile, where approximately 25% is very long term subordinated debt from the parent, combined with relatively shorter term senior debt over the next six years.

[Commercial-in-confidence—Graph redacted]

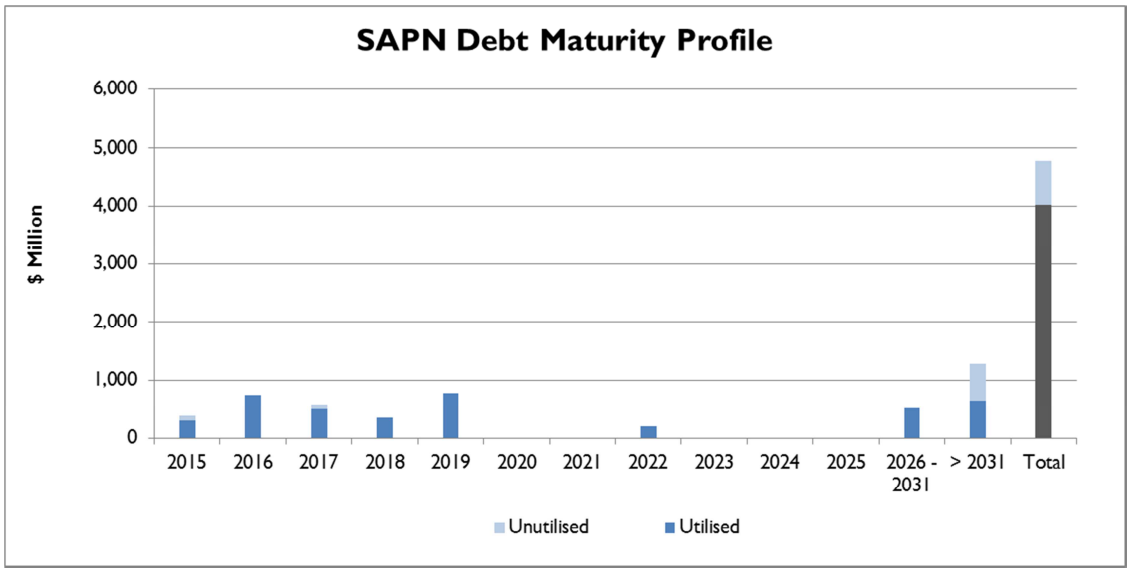
Graph 10: JEN Debt Maturity Profile

[Commercial-in-confidence—Text redacted]



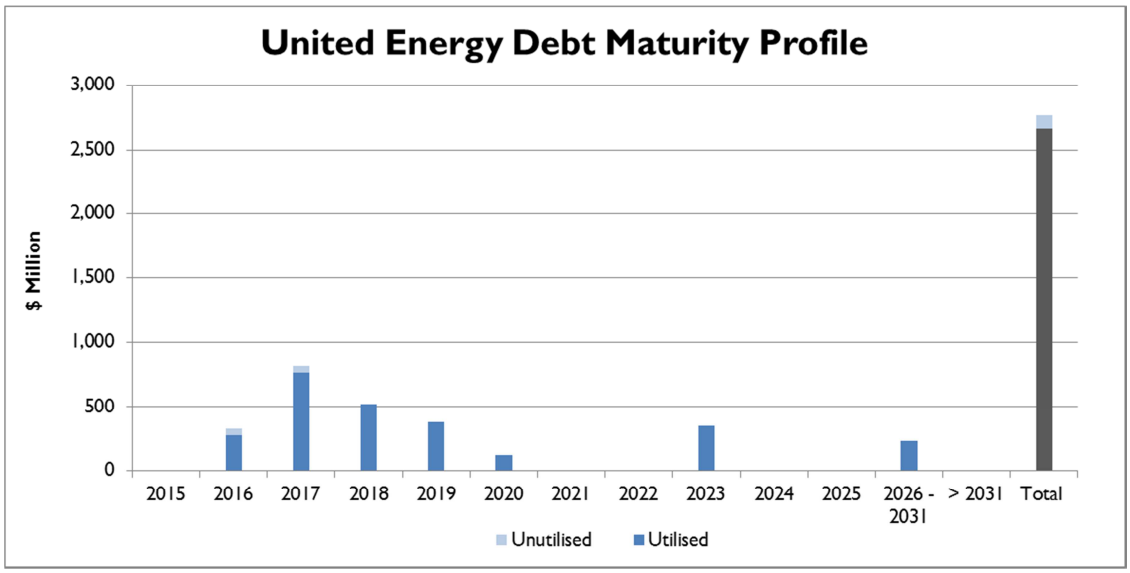
Graph 11: Powercor Debt Maturity Profile

Not surprisingly, Powercor follows a similar strategy to its sister company CitiPower. Graph 11 displays the same very long term subordinated debt for approximately a quarter of total debt with senior debt spread across the earlier years. However, this picture is more evenly spread across time than that for CitiPower.



Graph 12: SAPN Debt Maturity Profile

In combination with some long term subordinated debt, Graph 12 shows that SAPN has a somewhat shorter than benchmark debt profile, seemingly for tactical reasons of market availability and pricing relativities as they explain. This is again a flexible approach as relevant to EFP.



Graph 13: United Energy Debt Maturity Profile

Graph 13 highlights UE's somewhat greater reliance on shorter term maturities in its current debt profile. This may well be a response to reduced and more expensive long-term funding opportunities

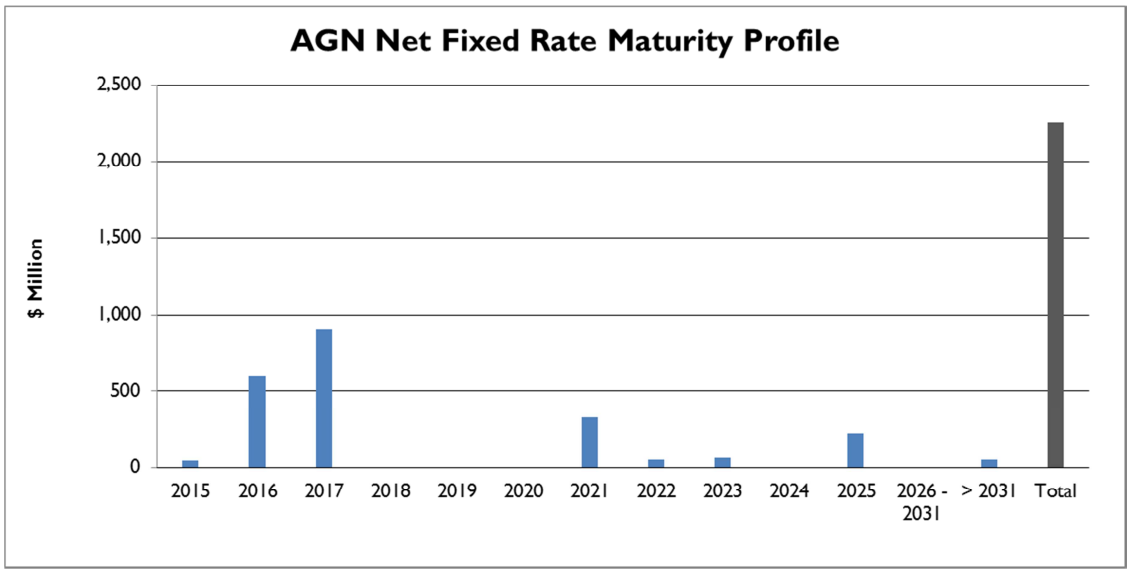
during and post-GFC, as UE has relied more heavily on bank debt, which is typically no longer than five years.

Net Fixed Rate Maturity Profile

Where the previous section was focused on liquidity management, this section focuses on interest rate risk management. The graphs below display the fixed base rate profile for the companies, after taking into account whether the debt is fixed or floating rate and what swaps are used either to convert fixed issues to floating at the time of issue or to pay fixed rate to link with the fixed rate regulatory allowance. For example, consider where the company has a fixed rate bond with 8 years remaining to maturity and an associated swap to the same maturity in which the company receives the fixed rate and pays BBSW. This combination would not show up in the graphs at all, i.e. the net fixed rate is zero, as the combination leaves them paying floating rates. Similarly debt raised as floating rate will not show up in these graphs. The bars only show fixed rate debt which has no associated swap and swaps where the company pays the fixed rate.

As well as showing the profile of fixed rates, each of the graphs should be compared to the Debt Maturity Profile graphs for that company in the previous section to determine if the total fixed rate amount is equal to the total debt outstanding. Some companies carry a part of the base interest rate exposure as floating rate rather than fixing it at any stage.

Note that no graph is included for AusNet. Their stated strategy is to follow the pure base rate hedging of the Basic Approach to EFP. However, they report only the swaps relevant to the electricity distribution business, whereas debt is for the whole group, making the totals and profiles not comparable.

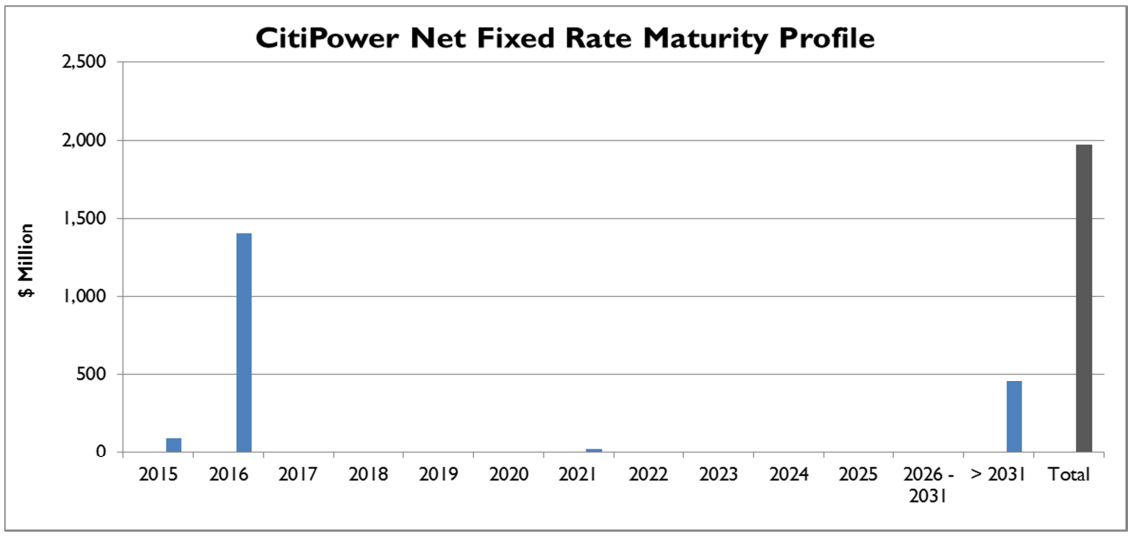


Graph 14: AGN Net Fixed Rate Maturity Profile

AGN's approach to base rate fixing, as seen in Graph 14, is to hold a mixture of fixed rates aligning with the regulatory period and staggered fixed rates locked in for terms and start dates quite different to the regulatory timing. The graph is consistent with AGN's description of using this

strategy to produce some kind of diversified base rate profile. The data reveals that AGN convert all foreign currency issues into floating rate at the time, whereas they leave fixed rate AUD issuance in fixed. This dichotomous approach to fix/float issuance leads to the lumpiness of the fixed rate profile instead of a smooth trailing average of fixed rates.

Comparing to Graph 7 it can be seen that the totals align, demonstrating that AGN's total debt amount is at a fixed rate, rather than any being at floating rates, after taking into account all debt and swaps.



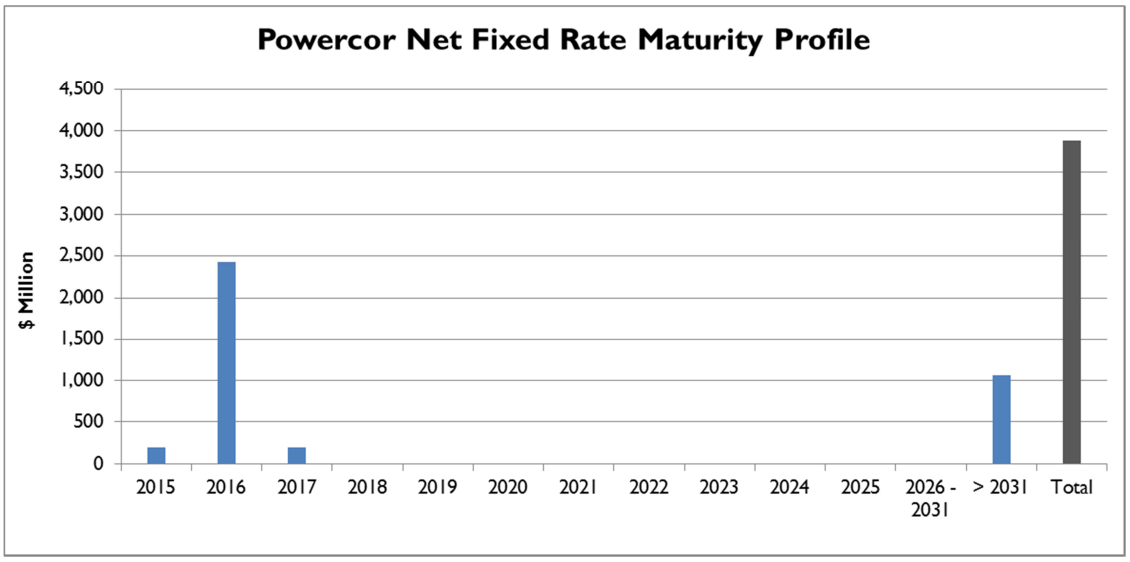
Graph 15: CitiPower Net Fixed Rate Maturity Profile

CitiPower shows in Graph 15 that they follow a clear matching policy for senior debt combined with a long term fixed rate approach for the more equity-like subordinated debt. The fixed rate exposure of the total senior debt is timed to the regulatory period roll-over.

[Commercial-in-confidence—Graph redacted]

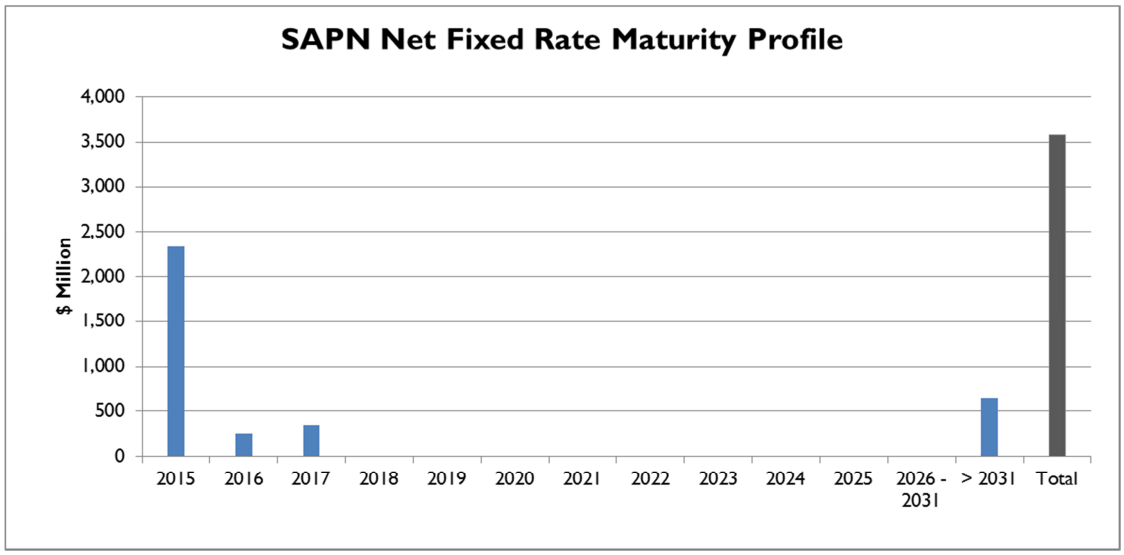
Graph 16: JEN Net Fixed Rate Maturity Profile

[Commercial-in-confidence—Text redacted]



Graph 17: Powercor Net Fixed Rate Maturity Profile

As for sister company CitiPower, Graph 17 demonstrates Powercor's strict regulatory period base rate matching for senior debt, combined with fixed rate long term subordinated.



Graph 18: SAPN Net Fixed Rate Maturity Profile

SAPN's stated practice of matching all fixed rates to the regulatory cycle is largely supported by the profile seen in Graph 18. However, the total fixed exposure is approximately 10% less than total debt. This could be due to the timing of the information request being just around the change of regulatory period so that some old swaps may have just matured and/or SAPN may not have included some forward starting swaps.

The long term fixed rate bar is for equity-like subordinated debt which was left at fixed rate, in a similar manner to that followed by other NSPs and in line with the partial equity character of the securities.

[Commercial-in-confidence—Graph redacted]

Graph 19: United Energy Net Fixed Rate Maturity Profile

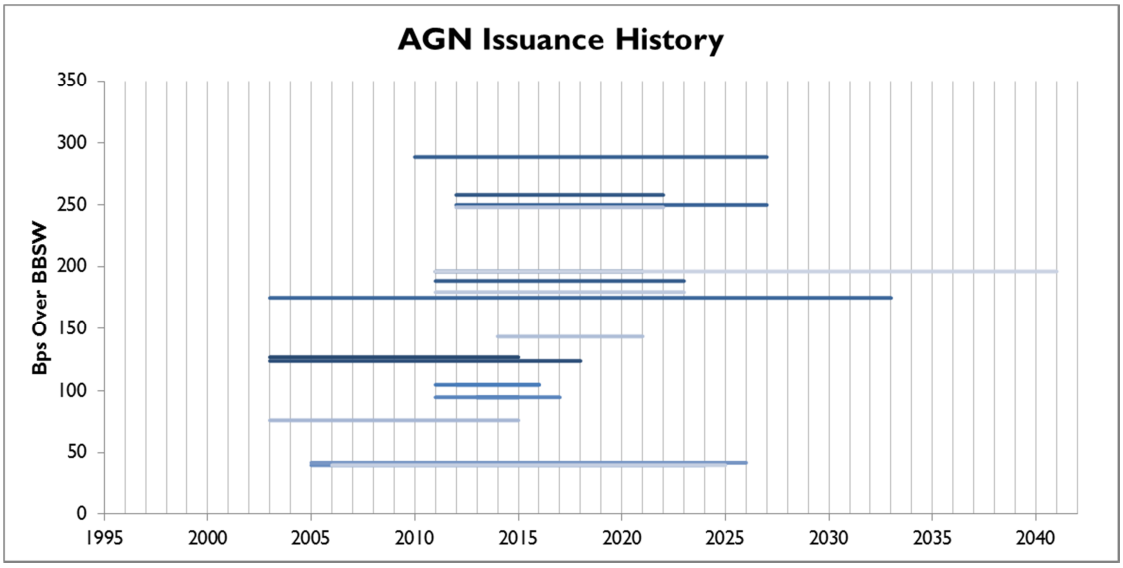
[Commercial-in-confidence—Text redacted]

The Term, Timing and DRP of Debt Raising

The graphs below exclude subordinated debt, as [Commercial-in-confidence—Text redacted]. The graphs do include fixed rate senior debt issues which the companies did not convert to floating rate at the time. Chairmont has calculated an approximate DRP at the time of issue for that section of the debt. This allows the graphs to show all of the effective DRPs carried by the company on 'pure' debt.

Note that use of different colours for bars in the graph is only to allow easier viewing of overlapping bars, i.e. colours have no meaning per se.

There is no graph for [c-i-c] because, as noted above, the debt portfolio they report is for the group whereas the swaps are for the electricity distribution business only, thereby not allowing a true comparison.



Graph 20 shows the wide range of terms and cost in AGN's current portfolio. Some features which it reveals are:

- There appears to be a preference for longer term debt both pre and post-GFC.
- No current debt was raised in the worst of the GFC time 2008-09.
- There was a corresponding backlog of issuance undertaken in 2011, along with one in 2010 and three in 2012.
- The term of debt issued ranges from two years to 30 years.
- Some high DRPs are being carried due to the issuance of long term debt, i.e. >10 years, in 2010 and 2012. These are balanced by some very low DRPs pre-GFC and for shorter term issues since then.

[Commercial-in-confidence—Text and charts redacted]