Sydney WATER

Sydney Water submission to IPART's WACC review issues paper 2017-18

18 August 2017

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Executive Summary

Sydney Water Corporation (Sydney Water) welcomes the opportunity to respond to the Independent Pricing and Regulatory Tribunal's (IPART's) *Review of our WACC method – Research Issues Paper, July 2017* (the Issues Paper). This submission outlines Sydney Water's views in relation to IPART's Issues Paper.

The Weighted Average Cost of Capital (WACC) is the minimum financial return an investor requires from an investment given its risk. It is the sum of weighted average returns expected from equity and debt capital.

IPART's WACC decision is a key input for calculating the allowance for a return on assets as part of the building block approach used to determine the revenue requirement of businesses IPART regulates. The new WACC method will apply to pricing decisions that take effect on or after 1 July 2018. In the case of Sydney Water and our customers, this will mean the new WACC method will take effect in our next price determination which will be from 1 July 2020.

In the context of regulated utilities, the objective for setting the WACC is to establish a value that reflects the efficient cost of capital for a benchmark entity. This is consistent with best practice incentive regulation designed to ensure that prices reflect efficient costs and that regulated businesses have strong incentives to improve efficiency.

As a regulated business, our positions are primarily influenced by the potential impact of IPART's WACC method and its outcomes on our five million end-use customers. We want to do the right thing by our customers and ensure their bills do not rise more than they could reasonably have expected, while maintaining quality of service. At the same time, we want to ensure the financial sustainability of Sydney Water, which in the long-run is in the best interest of our customers.

To that end, we believe that IPART's current WACC method has worked well. Following IPART's 2013 WACC review, Moody's upgraded Sydney Water's issuer rating, in a large part due to what it saw as a sensible regulatory best practice approach, reflecting a stable, predictable and transparent process.

In terms of improvements, the following two changes are worth noting specifically:

- an annually updating of the cost of debt; and,
- a trailing average approach to estimate the cost of debt.

While the above two changes compliment to each other, an annually updated cost of debt would best match the efficient benchmark entity approach. We have estimated that the largest likely range of changes to our end customer's nominal prices would be on average +/-$4-5 per annum (unsmoothed) and less in real terms. These are benefits which we want our customers to receive, however we believe, for such relatively small annual price changes, it is difficult to justify the administrative costs, complexity and extensive communication strategies required to inform the customers of the cause of the change.

The volume of administrative work on price changes will be increased by many folds under an annually updated WACC regime. Sydney Water has over 120 individual prices. Although these prices are updated annually for inflation, it is a relatively simple task compared to recalculation of smoothed prices in the post-tax revenue model for an annually updated WACC which would then need to be repeated every year in the regulatory determination period. This means price changes/recalculations in the regulatory determination increase from 480 (4 years x 120 prices) to 1,200 (4 years x 120 + 3 years x 120 + 2 years x 120 + 1 year x 120).

Further, our retail prices are intertwined with other regulated items such as wholesale price, but raise many other questions in practice such as:

- Should adjustments apply only to services charges? How should deemed usage sewerage charges be treated. If applied to usage charges what impact may this have on the long-run marginal cost signal sent to customers?
- Are impacts on tax allowance and working capitals are to be ignore? Should adjustments be to the average RAB only?
- Are price adjustments to capture water, wastewater and stormwater tariffs and ignore adjustment to trade waste and ancillary charges?
- How might price changes impact any future capex ECM or totex scheme?

For these reasons, instead we are advocating for an account of annual cost changes to be kept by firms and then a 'true up' in net present value (NPV) neutral terms be administered at the beginning of the next regulatory period. We further propose that the costs are to be recovered via smoothed prices over the entire period of the preceding determination. We believe this will afford customers and firms the benefits of an annually updated cost of debt, while avoiding unnecessary administrative costs and complexities.

1 Introduction

1.1 Overview

In this submission, we have addressed each of IPART's questions and preliminary views. In many instances, our positions remain unchanged since the previous IPART WACC method review in September 2013. We have also made our best effort to assess IPART's preliminary views from a practical perspective. Where possible, we suggest solutions to address practical challenges. Sydney Water's position on each of IPART's questions (**noted by bold**) is outlined below. Throughout this table and document, we have used the following terms to mean:

- **Supported**: Sydney Water agrees with IPART's preliminary view
- **Not supported**: Sydney Water has reservations with IPART's preliminary view
- **Accepted**: Sydney Water is not challenging or contesting IPART's preliminary view or proposal.

IPART's proposed approach

1. **Do you agree with our guiding principles? Are there any other principles we should consider?**

   Accepted. Sydney Water broadly agree with IPART's guiding principles. See section 2.1

2. **What are the benefits of having a common position across regulators? For which parameters is this consistency most important and why?**

   Accepted. IPART should look to harmonise its WACC method with other jurisdictions in so far as to achieve regulatory best practice which improves outcomes for a regulated firm's end customers. See section 2.2

How IPART measures WACC inputs

3. **Do you agree with our preliminary view that we should continue to define our benchmark entity as a firm operating in a competitive market facing similar risks to the regulated business?**

   Supported. During IPART's 2013 WACC Review, we requested this definition be adopted and we continue to support it. See section 3.1

4. **Do you agree with our preliminary view that we should synchronise sampling across all current parameters to take account of relationships between parameters and minimise systematic bias?**

   Supported. Conceptually we believe that synchronising of sampling will only service to reduce the impact of systematic bias and is a technically sound improvement. See section 3.2

5. **Do you agree with our preliminary view that we will choose and advise businesses of our sampling dates in advance?**

   Accepted. We believe that IPART ought to, as soon as is practically possible in advance of price reviews, confidentially advise regulated businesses of sampling dates. See section 3.2

   Should we disclose our sampling dates to other stakeholders?

   Not supported. We believe that IPART ought to maintain their practice of publicly releasing sampling dates once price determinations are finalised, maintaining the neutral impact on a businesses' financing risk. See section 3.2

Cost of debt

6. **Should we continue to set a single cost of debt for the regulatory period, or should this cost be updated during the period?**

   Supported. We believe that our end customers interests would be best served by adopting regulatory best practice and adopting an annually updated the cost of debt (CoD) estimate. This update is best served by adopting a trailing average (see response to question 7). However, we believe that the administrative costs associated with putting into practice a yearly CoD update will outweigh the benefits to our end customers. As such we are proposing that a yearly CoD be adopted, however, a net present value (NPV) neutral ex post adjustment / true-up be adopted at the beginning of the next price determination. This practice ought to avoid reoccurring administrative costs to Sydney Water, and still allow our customers to obtain all the benefits. See section 4.1

   If we set a single cost of debt, should it be adjusted to reflect future interest rate expectations using forward interest rates?

   Not supported. We do not believe that this approach is appropriate as it is likely to result in an asymmetric outcome in practice. See section 4.1

7. **Do you agree with our preliminary view that we should continue to use a combination of current market data and historical averages to estimate the cost of debt? If so, do you think we should place more weight on either of the two approaches?**

   Not accepted. We understand that a trailing average approach best matches the adoption of a yearly CoD update and the efficient financing practices of firms with long-lived infrastructure. However, we acknowledge that moving towards a trailing average approach would require a transition period, as regulated firms are likely to have adopted the incentive set by IPART and structured their debt with a combination of short-term and long-term debt; instantaneously unwinding such debt structures is not possible. See section 4.2

8. **Do you agree with our preliminary view that we should continue to use the 10-year BBB rated corporate bond spread data published by the RBA?**

   Accepted. See section 4.3

9. **Do you agree with our preliminary view that we should convert the published bond yield data into annualised yields?**

   Accepted. See section 4.4.1

10. **Do you agree with our preliminary view that we should continue to use coupon-paying bond yield data in estimating the cost of debt?**

    Accepted. See section 4.4.2

Cost of equity

11. **Do you agree with our preliminary views on how to calculate the cost of equity?**

    Accepted. IPART should use other models and information to inform its cost of equity estimate. See section 5.1.

12. **Do you agree with our preliminary view that we should continue to use the existing six methods to calculate the current MRP? Or should other MRP methods be included?**

    Accepted. We accept IPART's approach for deriving the current MRP estimates and using it for calculating the WACC. However, without access to IPART's underlying dividend growth models (DGMs) or dividend discount models (DDMs), it is difficult to provide meaningful comments. See section 5.2.1

13. **Should we change our approach to DDM estimates on analyst price targets and individual analyst EPS forecasts?**

    Not supported. We agree that there has been volatility in the in the short-term market risk premium (MRP) and that, maintaining stability in short-WACC parameters is an appropriate goal. However, we do not believe that the evidence presented by IPART sufficiently address the probable cause of the volatility, and so it is unclear if the proposed remedy is appropriate. We believe that more work ought to be conducted by IPART to establish the cause of the volatility and impact on the WACC of any proposed remedy. See section 5.2.2

14. **Do you agree with our preliminary view that we should use the median approach to determine the point estimate of the current MRP? Or should we exclude outliers in our calculation?**

Accepted. Without access to the relevant data, we are unable to make an evidence based assessment as to which approach – the midpoint or the median – better represents the ST MRP forecast or DDMs MRP forecast. That said we agree with IPART that the median is less affected by outliers than a mid-point. Further, outliers should not be removed as this can become either an arbitrary approach or may overly rely on mechanistic outlier detection. See section 5.2.3

15. Do you agree with our preliminary view that we should re-estimate equity betas at each price review?

Not supported. Our view is that the equity beta should be re-estimated only after a significant structural change in financial markets, such as the Global Financial Crisis (GFC) (2009-2012), is recognised. We believe that re-estimation of the equity beta at each price review may increase the volatility in IPART's regulatory WACC estimates unnecessarily. See section 5.3.1

16. How formal should the process of selecting proxy companies for beta analysis be?

Accepted. We maintain our position as set out in our 2013 submission on this issue, which is to adopt a transparent, structured pragmatic approach, seeking to maximise the accuracy of beta estimates. See section 5.3.2

17. How often should beta estimates be refreshed with new econometric analysis?

Accepted. As discussed in our response to question 15, we believe that equity beta's need only be re-estimated following a significant structural change in financial markets. See section 5.3.3

18. Do you agree with our preliminary view that we should decide on the appropriate beta having regard to the OLS methods with and without adjustments?

Accepted. It is widely accepted that ordinary least squares (OLS) methods in the estimation of equity betas are biased. As such having regard to estimates without adjustments would not be appropriate. See section 5.3.4

What adjustments, if any, should be made to estimated betas?

Accepted. We believe that an adjustment is required to OLS equity beta estimates and support the continued use of the Vasicek (1973) adjustment. See section 5.3.4

We also believe that IPART ought to consider or account for at least the following potential biases: capital structure, data frequency, portfolio weighting, estimation period, and known downward bias of equity betas in the capital asset pricing model (CAPM) for betas <1.

Current method for calculating the WACC

19. Should we consider any changes to how we calculate our uncertainty index?

Supported. We consider the uncertainty index continues to be a transparent and logical approach to making adjustments to the WACC. See section 6.1.1

20. Do you agree with our preliminary view that we should only consider deviating from our standard approach if the uncertainty index is more than one standard deviation from its historical average since mid-2001?

Supported. We consider the practical application of the uncertainty index based on a 1 standard deviation trigger continues to be a transparent and logical approach. See section 6.1.2

21. Do you agree with our preliminary view that we should retain discretion to determine the weighting of current and historical market data when the uncertainty index is outside the range of one standard deviation from its historical average of zero?

Accepted. We accept the current approach of allowing for a level of discretion during periods of uncertainty rather than a strict rule. However, we would find it informative, ifr IPART could provide illustrations of how WACC outcomes, based on historical data, would have been changed, had IPART applied its discretion as if the uncertainty index was outside of one standard deviation. . See section 6.1.2

Should we adopt a specific decision rule for abnormal market conditions? If so, what should the rule be?

Not supported. We believe a strict rule may remove the initially desired flexibility of discretion. However, in exercising its discretion, Sydney Water considers that IPART needs to specify and apply a consultative,

consistent and transparent framework by which it exercises such judgement. In doing so, IPART will promote the certainty and transparency of its price setting process. See section 6.1.2

22. Do you agree with our preliminary view that we should review the gearing at each price review?

Not supported. We do not support IPART's preliminary view that the gearing should be reviewed at each price review, as it may import instability from international proxy firms. However, if IPART adopts its preliminary view it is critical that such reviews are conducted sufficiently prior to each firm's price review to enable timely utility modelling and sound business plans to be developed and submitted. See section 6.2

Value of gamma and measuring inflation

23. Do you agree with our preliminary view that we should continue to use 0.25 as the value for gamma? If not, what evidence can you provide that supports a different value?

Accepted. We accept using the prevailing gamma value of 0.25. See section 7.1

24. Do you agree with our preliminary view that we should continue to forecast inflation as the geometric average of the midpoint of the RBA's 1-year ahead inflation forecast and the midpoint of the RBA's target inflation band?

Accepted. In principle, we support IPART's current geometric average mid-point approach and the proposed change to the calculation of the geometric average. We note that although the geometric average approach is imperfect, it is transparent, simple and consistent.. See section 7.2

25. Do you agree with our preliminary view that our forward-looking inflation forecast is the best method to deflate the nominal WACC?

Accepted. We do not agree with IPART's preliminary view. We maintain our position as expressed in our 2013 submission[1] that, it is more appropriate to use a best estimate of expected inflation over the regulatory period instead of using long-term inflation expectations. See section 7.3

26. Do you agree with our preliminary view that we should change the way that we calculate expected inflation to consider the geometric average of the change in the level of prices?

Accepted. We agree in principle with the proposed change to the geometric averaging method. See section 7.4

1.2 Structure of this submission

The following chapters of this submission provide detailed comments on the following areas:

- Chapter 2 – IPART's proposed approach
- Chapter 3 – Measuring WACC inputs
- Chapter 4 – Cost of Debt
- Chapter 5 – Cost of Equity
- Chapter 6 – Current method for calculating the WACC
- Chapter 7 – Value of gamma and measuring inflation

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[1] NERA, Op. Cit., p.14

2 IPART's proposed approach

2.1 IPART's guiding principles

(Question 1) Do we agree with IPART's guiding principles? Are there any other principles IPART should consider?

Sydney Water agrees with IPART's guiding principles and believes that they adequately reflect the matters IPART must consider in making their determinations and recommendations.[2]

Sydney Water believes that in the context of regulated utilities, the primary objective for setting the WACC is to establish a value that reflects the efficient cost of capital for a benchmark entity. We believe that this is consistent with best practice incentive regulation.[3]

As a regulated business, our positions are primarily influenced by the potential impact of IPART's WACC method on our five million end-use customers. We want to do the right thing by our customers and ensure their bills do not rise more than they could reasonably have expected, while maintaining quality of service. At the same time, we want to ensure the financial sustainability of Sydney Water, a crucial element of which is a stable WACC, which in the long-run is in the best interest of our customers.

2.2 Common position across regulators

(Question 2) What are the benefits of having a common position across regulators? For which parameters is this consistency most important and why?

Sydney Water believes that generally harmonising positions across regulators is beneficial, in so far as harmonisation brings about improvements to IPART's WACC method. That is, change toward regulatory best practice.

A benefit of (greater) commonality amongst regulatory methods is improved comparability of regulated firms, reducing regulatory risk differences for investors, and hence financing risks, which should feed through to lower regulated prices.

Additionally, we believe investors prefer stable returns over the long-run for long-lived monopoly infrastructure assets, regardless of who a firm's regulator is. This suggests that investors are likely to expect a similar level of risk for such firms, and that a benchmark efficient firm best matches this long-run risk appetite.

With this in mind, we believe that several parameters of the WACC for firms with long-lived monopoly assets could be thought of as being common. These include the Cost of Debt (CoD), gamma, inflation and gearing.

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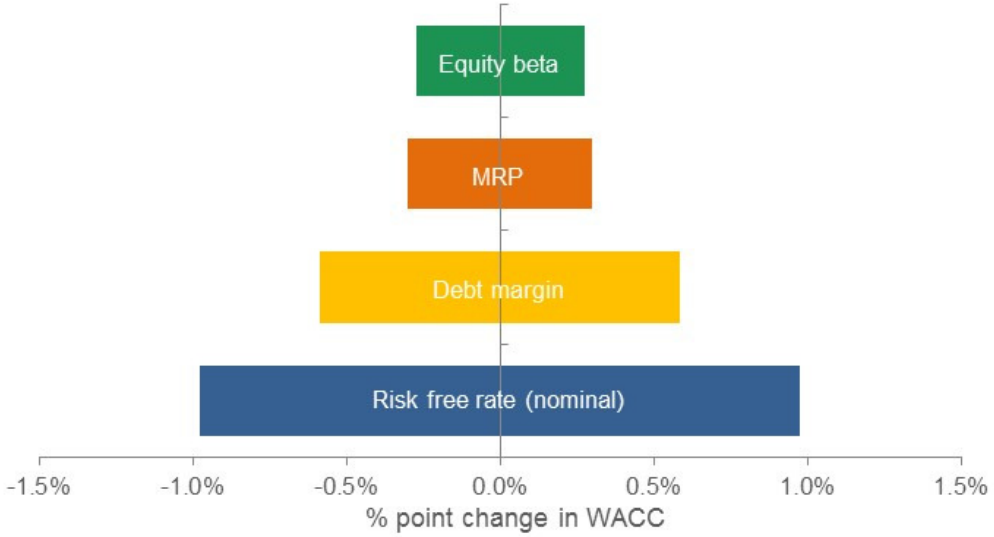
[2] See Section 15 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act).
[3] Regulation designed to ensure that prices reflect efficient costs, that regulated businesses have strong incentives to improve efficiency and ensure efficient use of regulated services - consumers are shielded from the incentive and ability of firms to raise prices, in a sustained or substantial manner.

3 Measuring WACC inputs

Sydney Water supports efforts by IPART that improve the accuracy of the WACC by reducing measurement error and/or biases in WACC input parameters.

The practical impact of reducing measurement error and/or biases, all else equal, can be large. Figure 1 summarises impacts on the WACC (real, post-tax) due to a 1 percentage point change in inputs or a 0.1 change in the equity beta.[4]

Figure 1: Impact of measurement error or biases on WACC outcomes



3.1 Definition of the benchmark entity

(Question 3) Do you agree with our preliminary view that we should continue to define our benchmark entity as a firm operating in a competitive market facing similar risks to the regulated business?

Sydney Water agrees that IPART maintain a definition and application of a benchmark entity. We believe that this position continues to be regulatory best practice and is consistent with our proposed position in IPART's 2013 WACC review.

We believe that the benchmark entity definition aligns with the IPART's guiding principles and objectives, broadly the promotion of efficient investment in, and efficient operation and use of regulated infrastructure for the long-term interests of consumers. Consistent with these guiding principles, and setting the cost of capital with reference to a benchmark entity, will ensure the allowed return for a firm is in line with efficient financing costs.

[4] Based IPART's February 2017 WACC market update of a post-tax real WACC of 4.90%.

3.2 Sampling across all parameters and provision of information to businesses

(Question 4) Do you agree with our preliminary view that we should synchronise sampling across all current parameters to take account of relationships between parameters and minimise systematic bias?

Sydney Water agrees that synchronise and aligning sampling dates would be beneficial by removing measurement error and/or biases, with little to no additional administrative costs.

(Question 5) Do you agree with our preliminary view that we will choose and advise businesses of our sampling dates in advance? Should we disclose our sampling dates to other stakeholders?

Sydney Water believes that IPART ought to confidentially advise regulated businesses of sampling dates well in advance of price reviews. Further, we believe that IPART ought to maintain their practice of publicly releasing sampling dates once price determinations are finalised, maintaining the neutral impact on a businesses' financing risk.

4 Cost of debt

Sydney Water believes that regulatory best practice establishes that the WACC ought to be set to ensure an efficient business generates a sufficient return to: service its ongoing debt requirements; provide returns for shareholders; and, sustain ongoing efficient infrastructure investment to service its customers.

These WACC objectives set for an efficient business, provides guidance on how the efficient cost of debt (CoD) ought to be set. This means that the CoD should:

- be set by reference to benchmark debt (regulator specified type, term, credit rating of debt, etc)
- reduce debt financing risks faced by firms by reducing as best possible differences between the regulated CoD allowance and the incurred cost by an efficient benchmark firm.

Overall reducing debt financing risks, lowers risks of investing in regulated firms and/or services by reducing the volatility of the returns on equity, all of which ought to feed through to lower regulated prices and be in the best interests of our end customers.

4.1 Single cost of debt for the regulatory period versus annual updates

(Question 6) Should we continue to set a single cost of debt for the regulatory period, or should this cost be updated during the period? If we set a single cost of debt, should it be adjusted to reflect future interest rate expectations using forward interest rates?

Sydney Water in principle supports an annually updated CoD as being regulatory best practice which best matches the efficient benchmark entity approach as described in our 2013 submission[5]. Further, both customers and firms can benefit by avoiding windfall gains and losses. We believe that IPART's current approach[6] of taking a midpoint of current and historical estimates of the CoD is still essentially an 'on the day' approach which considers a historical average on that day.

That said, although we are advocating for an annually updated CoD, we believe that the complexity and cost of going so far as changing end customer prices annually outweighs the likely benefits to customers. We have estimated that the largest likely range of changes to our end customer's nominal prices would be on average +/-$4-5 per annum (unsmoothed); [7]less in real terms and when smoothed over any remaining years of the regulatory period.

Instead we are advocating for an account of annual cost changes to be kept by firms and then a 'true up' in net present value (NPV) neutral terms be administered at the beginning of the next regulatory period. Where costs are to be recovered via smoothed prices over the entire period of

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[5] NERA report Response to IPART's WACC methodology Discussion Paper, March 2013, p.10

[6] The approach differs markedly from the trailing average cost of debt approaches recently adopted in some other jurisdictions. At the core of these other approaches is the concept that cost of debt is not static but rather changes over time. In these jurisdictions, the trailing average cost of debt is treated as a rolling average and therefore differs in each year of the regulatory period with the annual changes reflecting the long terms trends in CoD movement, unlike the single rate imposed by IPART over the course of the whole regulatory period

[7] The assumptions underlying this calculation provided in the excel attachment to this submission "Attachment: Approximate customer impact of annual CoD updates."

the preceding determination. We believe this will afford customers and firms the benefits of an annually updated CoD, while avoiding unnecessary administrative costs and complexities.

If the above propositions are adopted by IPART, we believe that a transition period should apply. This is because we believe it is likely that a regulated firm's actual debt portfolio is likely to have been influenced by a regulators historical approach to the CoD, and cannot instantaneously be unwound and matched to the new regulatory approach. Therefore, to avoid any unnecessary debt financing risks or unduly punishing or rewarding firm's due to a regulatory shift.

Ultimately Sydney Water is open to discussion of what such a transition period may look like, as we appreciate that such a change will impact all regulated firms equally, and that such a scheme would be imperfect, but nonetheless would need to be practical in nature.

Appendix A provides details on the several matters raised above.

4.2 Mix of current market data and historical averages to estimate the cost of debt

(Question 7) Do you agree with our preliminary view that we should continue to use a combination of current market data and historical averages to estimate the cost of debt? If so, do you think we should place more weight on either of the two approaches?

Given our position for Question 6 above, which is in line with our position proposed in our 2013 submission that 10-year trailing average approach is the most appropriate method to estimate the regulatory cost of debt.[8], Sydney Water does not support the continued use of a combination of current market and historical averages.

4.3 Measuring the debt margin

(Question 8) Do you agree with our preliminary view that we should continue to use the 10-year BBB rated corporate bond spread data published by the RBA?

Sydney Water agrees with IPART's preliminary view. A close matching of the actual and regulated CoD derived from the underlying BBB bond spread data supports the continuing of the approach.

4.4 Adjusting the bond market data

4.4.1 Annual rates with semi-annual compounding

(Question 9) Do you agree with our preliminary view that we should convert the published bond yield data into annualised yields?

Sydney Water agrees with IPART's proposed approach as being the more technically correct way to obtain an annualised yield.

4.4.2 Zero-coupon yields

(Question 10) Do you agree with our preliminary view that we should continue to use coupon-paying bond yield data in estimating the cost of debt?

Sydney Water agree with IPART's preliminary view.

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[8] NERA report on IPART WACC Methodology Draft report, November 2013, p.8

5 Cost of equity

In principle, we support IPART's suggested refinements to the cost of equity (CoE). However, we believe that any refinement should address internal inconsistencies within the current WACC method. Estimating the cost of equity

5.1.1 Commitment to stability of the Capital Asset Pricing Model (CAPM) and cost of equity

In its 2013 Draft Determination, IPART [9] expressed a view that the Sharpe CAPM used may exhibit a degree of downward bias and agreed corrective measures are required. This view is in line with views expressed by the Australian Energy Regulator (AER) on this issue[10] and was supported by Sydney Water.

However, from our observations of IPART's historical WACC estimates since 2014, it is unclear if IPART has applied any corrective remedies discussed in its 2013 Draft Determination. As a basic principle Sydney Water seeks ongoing commitment from IPART to use alternative CAPMs such the Fama French, Black or Sharpe-Lintner models to address the acknowledged downward bias of the Sharpe CAPM.

More broadly, as mentioned in section 4, Sydney Water supports any method which promotes a stable CoD, being in the ultimate interests of end customers.

5.1.2 IPART's current approach: current and historic cost of equity

(Question 11) Do you agree with our preliminary views on how to calculate the cost of equity?

We agree with IPART's preliminary views on how to calculate the CoE, including the use of the historical market risk premium (MRP) of 6 per cent. That said, if a CoD based on a trailing average with annual updates is adopted, to maintain internal consistency of the WACC (CoE estimates higher than CoD), consideration ought to be given to adopting a CoE based on the same 10-year trailing average with annual updates.

5.2 Estimating the current MRP

5.2.1 Use of Dividend Discount Models (DDM) for estimating current MRP

(Question 12) Do you agree with our preliminary view that we should continue to use the existing six methods to calculate the current MRP? Or should other MRP methods be included?

While Sydney Water supports IPART's current approach for setting the short-term MRP using dividend discount models (DDMs), it is difficult to provide meaningful comment without access to the underlying models and data. As such we request that IPART share the relevant models and data with stakeholders with any relevant confidentiality agreements.

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[9] See IPART, WACC Methodology Draft Report 2013 p.28
[10] AER, Better regulation: Explanatory statement – Draft rate of return guideline, August 2013, p 196

That said, Sydney Water values IPART's approach to capturing multiple sources of short-term market dynamics in its DDMs, and ultimately the short-term WACC, by combining multiple short-term MRP's and RFR's within its DDMs. Overall the theme that current market conditions influence the short-term MRP and ultimately returns to equity is reasonable.

5.2.2 Inputs to DDMs for estimating the MRP

(Question 13) Should we change our approach to DDM estimates on analyst price targets and individual analyst EPS forecasts?

We agree that there was a variation in the short-term (current) MRP estimates between 2014 August and 2017 June. However, we believe that IPART's preliminary views could be enhanced by analysis: estimating the extent of the underestimation; and, exploration of the probable causes of the volatility.

Such analyses would give stakeholders a greater insight into the issue and an ability to better assess the likely impact the change might have on the MRP, considering the objective of stability of the WACC.

Additionally, we believe that attention ought to be paid to the RFR used in DDM models. Inconsistency between the RFR in the CAPM and DDM is likely to introduce internal inconsistency[11] in the WACC.

Finally, we maintain our 2013 position[12] that DDMs should continue accounting for franking credit benefits for Australian investors via a gamma parameter.

5.2.3 Best approach for representing the MRP point estimate

(Question 14) Do you agree with our preliminary view that we should use the median approach to determine the point estimate of the current MRP? Or should we exclude outliers in our calculation?

Without access to the relevant data, we are unable to make an evidence based assessment as to which approach – the midpoint or the median – better represents the ST MRP forecast or DDMs MRP forecast. That said, we agree with IPART that the median is less affected by outliers than a mid-point. Further, outliers should not be removed as this can become either an arbitrary approach or may overly rely on mechanistic outlier detection.

5.3 Estimating the equity beta

With reference to the objectives of stability and consistency, the equity beta is a key parameter in setting the cost of equity and WACC. All else equal, a 0.1-unit increase in the Sydney Water equity beta produces an approximate 0.3 percentage point increase in the WACC.

On these grounds, we continue to support IPART's historical estimate of an equity beta of 0.7 for Sydney Water.

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[11] NERA report on IPART WACC Methodology Draft report, November 2013, p.11
[12] NERA report on IPART WACC Methodology Draft report, November 2013, p.9

5.3.1 Re-estimating the equity beta

(Question 15) Do you agree with our preliminary view that we should re-estimate equity betas at each price review?

Sydney Water does not agree with IPART's preliminary view to re-estimate equity betas at each price review. We are of the view that the equity beta should only be re-estimated following a significant structural change in financial markets, such as the Global Financial Crisis (GFC) (2009-2012). We believe, given the sensitivity of the WACC to equity beta values described above, that re-estimation of the equity beta at each price review may unnecessarily introduce volatility driven by external factors in the sample of proxy firms used for the equity beta, into IPART's regulatory WACC estimates.

However, should IPART retain its preliminary view, Sydney Water believes such reviews should occur well in advance of any price review. This will ensure that firms know well in advance the values of equity beta (and gearing) to enable business planning and modelling.

5.3.2 The process for selecting proxy companies

(Question 16) How formal should the process of selecting proxy companies for beta analysis be?

We maintain our position as set out in our 2013 submission[13] and 2016 Price Review[14] on this issue, which is to adopt a transparent, structured pragmatic approach, seeking to maximise the accuracy of beta estimates.[15] The steps are briefly outlined in Appendix B.

5.3.3 Use of different econometric analysis

(Question 17) How often should beta estimates be refreshed with new econometric analysis?

As discussed in our response to Question 15, we believe that equity beta's need only be re-estimated following a significant structural change in financial markets.

5.3.4 Adjustment for bias in the equity beta estimate

(Question 18) Do you agree with our preliminary view that we should decide on the appropriate beta having regard to the OLS methods with and without adjustments? What adjustments, if any, should be made to estimated betas?

We believe that an adjustment is required to ordinary least squares (OLS) equity beta estimates and support the continued use of the Vasicek (1973)[16] adjustment.

We also believe that IPART ought to consider or account for at least the following potential biases: capital structure, data frequency, portfolio weighting, estimation period, and known downward bias of equity betas in the capital asset pricing model (CAPM) for betas <1. We provided IPART with greater detail of these biases and appropriate adjustments via a 2015 expert report. [17]

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[13] NERA report on IPART WACC Methodology Draft report, November 2013, p.5
[14] Houstonkemp report on Equity beta for a Benchmark Australian Water Network Service Provider, p. 8-9
[15] Houstonkemp report on Equity beta for a Benchmark Australian Water Network Service Provider, p.5
[16] As used in SFG report on Cost of capital parameters for Sydney Desalination Plant, 10 August 2011, p.7-8
[17] Houestonkemp Economist, June 2015, Equity Beta for a Benchmark Australian Water Network Service Provider, A report for Sydney Water p. 20

6 Current method of calculating the WACC

IPART's WACC method takes the average of a long-term and short-term WACC, unless a period of market volatility is detected, at which point IPART's discretion is applied to in coming to a representative WACC. In principle, we support such an approach as being pragmatic and generally transparent. However as discussed earlier, our proposition to adopt a trailing average approach would make IPART's current method of calculating the WACC redundant. Our responses to Questions 19 to 22 should be read based on the assumption that IPART retains its current approach.

6.1 Uncertainty index, market volatility and calculating WACC in volatile market environment

6.1.1 Current approach for constructing the uncertainty index.

(Question 19) Should we consider any changes to how we calculate our uncertainty index?

We consider the uncertainty index continues to be a transparent and logical approach to adjusting the WACC and support retaining the current approach.

6.1.2 Decision making under abnormal market conditions

(Question 20) Do you agree with our preliminary view that we should only consider deviating from our standard approach if the uncertainty index is more than one standard deviation from its historical average since mid-2001?

We consider the practical application of the uncertainty index continues to be a transparent and logical approach. We believe the historical evidence illustrates that a one standard deviation threshold is an adequate safeguard maintaining stability of the WACC from volatile market conditions. However, we would find it informative if IPART could provide illustrations, based on historical data, of how WACC outcomes would have been changed had IPART applied its discretion and/or a rule (if one can be devised) assuming an uncertainty index outside of one standard deviation. .

(Question 21) Do you agree with our preliminary view that we should retain discretion to determine the weighting or current and historical market data when the uncertainty index is outside the range of one standard deviation from its historical average of zero? Should we adopt a specific decision rule for abnormal market conditions? If so, what should the rule be?

In principle, we agree with the current approach of allowing for a level of discretion during periods of uncertainty. We believe a strict rule may remove the initially desired flexibility of discretion. That said, in exercising discretion, IPART should outline and apply a consultative, consistent and transparent framework by which it exercises such judgement. In doing so, IPART will promote the certainty and transparency of its price setting process.

(Question 22) Do you agree with our preliminary view that we should review the gearing at each price review?

We do not support reviewing gearing at each price period. Gearing decisions are based on the benchmark entity. We believe that gearing should only be reviewed if there are obvious structural changes within Australia that would bring about the need to assess gearing. IPART's gearing review is based on proxy firms, many of which are international firms. Reviewing gearing at each

price review would likely import structural changes and unnecessary instability that may not be representative of the Australian experience.

7 Value of gamma and measuring inflation

Sydney Water supports IPARTs currently adopted value of 0.25 for gamma. Importantly, gamma is not included as a variable in IPART's current post-tax revenue model. However, gamma influences the WACC indirectly via IPART's short-term MRP estimate derived through the Dividend Discount Models (DDMs) and Dividend Growth Models (DGMs),

Inflation forecasts are used by IPART to deflate the WACC from a nominal to a real value. Given the WACC at present is set for the length of a determination and not 'trued-up' for actual inflation, Sydney Water supports any improvements to inflation forecasts which minimise or avoid windfall gains or losses.

7.1 Gamma

(Question 23) Do you agree with our preliminary view that we should continue to use 0.25 as the value for gamma? If not, what evidence can you provide that supports a different value?

Sydney Water retains its position from 2015[18], and continues to support a value for gamma of 0.25.

7.2 Measuring inflation

(Question 24) Do you agree with our preliminary view that we should continue to forecast inflation as the geometric average of the midpoint of the RBA's 1-year ahead inflation forecast and the midpoint of the RBA's target inflation band?

In principle, we support IPART's current geometric average mid-point approach and the proposed change to the calculation of the geometric average. We note that although the geometric average approach is imperfect, it is transparent, simple and consistent.

7.3 Best method for deflating the nominal WACC

(Question 25) Do you agree with our preliminary view that our forward-looking inflation forecast is the best method to deflate the nominal WACC?

We do not agree with IPART's preliminary view. We maintain our position as expressed in our 2013 submission[19] that, it is more appropriate to use a best estimate of expected inflation over the regulatory period instead of using long-term inflation expectations.

Further, in 2013 we proposed that IPART's approach to setting inflation expectations is inconsistent with its stated WACC objective. That is, we proposed that IPART had incorrectly made the presumption that it should adopt a long-term forecast of inflation expectations. This approach is problematic when long-term inflation expectations differ substantially from forecast inflation over the regulatory period. Using inflation expectations measured over a different period from that for which prices are to be determined will likely lead to windfall gains or losses.

[18] NERA report on IPART WACC Methodology Draft report, November 2013, p.9
[19] NERA report on IPART WACC Methodology Draft report, November 2013, p.14

7.4 Calculating the geometric average

(Question 26) Do you agree with our preliminary view that we should change the way that we calculate expected inflation to consider the geometric average of the change in the level of prices?

We agree in principle with the proposed change to the geometric averaging method.

8 Appendices

8.1 Appendix A: Costs & benefits of annually updating the cost of debt and steps in a possible true-up process.

8.1.1 Summary of the likely process for updating annual prices for trailing average WACC

Sydney Water has 20 price tables and more than 120 individual prices for its regulated products and services, many of which feed through to other regulated items such as wholesale prices. Administration on annual adjustments could be burdensome, depending on how the CoD adjustment is to be modelled, and how the impacts are to be applied to prices. Below we outline seven issues and likely initial solutions which could be considered to lessen this burden if our preferred 'true-up' process discussed below is not adopted:

- CoD adjustment is only carried out on RAB (average) only. Impacts on tax allowance and working capitals are to be ignore.
- price adjustments are to be done on water, wastewater and stormwater tariffs, no adjustment to be applied to trade waste and ancillary charges.
- adjustments to water and wastewater are applied to service charges only, and not on usage charges (therefore, no adjustments for deemed usage sewerage charges, either).
- for stormwater, price adjustments are only applying to normal drainage charges for declared stormwater services, and not to Rouse Hill stormwater charges.
- note that there may be complexity in applying the adjustment equitably to the area-based stormwater charges.
- note that there may be complexity in the calculation of adjustments if a price path is to be smoothed.
- there may be further complication in the calculation if ECM on capex were to be in operation.

True-Up Process

During the price review

1.1 When establishing price controls during a periodic review, only the WACC for year 1 will be known (and final). This cost of debt allowance in this WACC will reflect the trailing average over the 10 years prior to year 1 (lagged by 3 months).

1.2 The WACCs for the remaining three years of the regulatory period will not be known (as the trailing average for years 2 onwards use information that only becomes available during the new regulatory period). However, a simple assumption is that the year 1 WACC applies for the period. Given this assumption, the X factors (or prescribed price movements) are then estimated in the usual way.

Annual update for year 2

2.1 The annual update for year 2 occurs just prior to the commencement of that year. At this time, actual debt costs for the previous year (lagged by 3 months) are available, and so the trailing average cost of debt can be calculated for year 2, and from this the final WACC for year 2. The annual updating process involves:

2.1.1 Recalculating the target revenue for years 2 to 4 (the target revenue for year 1 was correct at the time of the price review). Again, an assumption will be required about the WACC for years 3 to 4, but a simple assumption is to assume that the year 2 WACC continues for the remainder of the period.

2.1.2 Recalculating the X factors (or prescribed price movements) for years 2 to 4 so that the forecast and target revenues align (in present value terms). The X factor for year 1 is held fixed.

2.1.3 The new X factor (prescribed price movement) for year 2 is then applied to establish prices for year 2.

Annual update for year 3

3.1 The update in relation to year 3 repeats the process adopted in year 2:

3.1.1 A new trailing average cost of debt (and so WACC) for year 3 is calculated (and an assumption is again required about the WACC in year 4).

3.1.2 The revenue requirement for years 3 onwards is recalculated using the new WACC (the revenue requirements for years 1 and 2 are held fixed at their values in the previous year's update), and

3.1.3 *The X factors for years 3 and 4 are recalculated, holding the X factors for years 1 and 2 fixed at their values in the previous year's update.*

Annual update for year 4

4.1 A new trailing average cost of debt (and so WACC) for year 4 is calculated.

8.1.2 Steps for a true-up methodology

1) Changes in the CoD would be calculated annually and the impact on Sydney Water's annual revenue requirement (ARR) would be assessed (using the methodology set out above).
2) Businesses would be required to maintain a separate regulatory account, similar to an 'unders and overs' account.
3) Any differences in the allowed revenues created by the difference between the actual CoD and the CoD set at the beginning of the regulatory period will be allocated to the regulatory account.

4) At the end of the regulatory period, the balance of this account (either positive or negative) will be factored into the subsequent price review. The balance will be rolled-forward using the nominal WACC to keep the business NPV neutral.

5) The impact of that balance will be smeared across all of the next regulatory period (and not as a lump sum at the start of the period).

8.1.3 Costs and benefits of moving to a trailing average CoD approach

The implications include:

- **Reduced price volatility in allowed revenue between regulatory periods**. Under the current approach, the risk remains that the regulatory CoD is exposed to 'step changes' between regulatory reviews, since the prevailing CoD may substantially change from the beginning to the end of the regulatory period. If steps are not taken to smooth this short-term impact on prices over a longer term when prices are determined then consumers could be exposed to large changes when prices are being set. Introducing a trailing average approach would help to smooth this potential impact out.

- **Increased price volatility within period** if CoD updates are passed through to customers on an annual basis. The materiality of this will depend on the movements in CoD, whether the trailing average is gradually introduced through transitional arrangements and whether there are other drivers for annual prices changes approved by the IPART (e.g., cost pass through events).

- **Increased complexity and lack in transparency** in the allowed revenue calculation (see above section). The trailing average CoD approach aims to more closely align the regulatory and actual CoD faced by the benchmark firm. However, this greater precision may introduce increased complexities to the regulatory approach. For example, a key feature of the trailing average approach is the need to make assumptions on the length of period plus the correct weighting for each year that ensures new borrowings arising from investments are compensated at the prevailing rate. We understand that the AER assumes equal 10% financing over a 10-year period, but there is no evidence that this is appropriate or reflective of business' financing methods.

  Therefore, the need to make such necessary assumptions on the profile and nature of debt financing under the trailing average approach in turn creates a new potential mismatch which could reduce the extent to which the regulator/business can achieve consistency between regulated and actual CoD.

- **Encourages efficient financing decisions.** Updating the CoD annually could help ensure the CoD financing is efficient. Where there is a mismatch between the actual CoD during the regulatory period and the regulatory allowance lock in at the start under the "on the day" approach, this could create distortions in the way in which Sydney Water approaches its debt financing.

- **Investment incentives.** A disadvantage with the "on the day" approach is that it can create a gap between the allowed rate of return and the current market rates. If new capital expenditure earns a return that is materially different from the prevailing market rates, there

is an obvious incentive problem and will impact on investment. If current CoD is higher than the allowed level set at the start of the period, the business may have an incentive to under-spend.

- **Provides Sydney Water and its customer with greater protection,** particularly if Sydney Water needs to raise debt during the regulatory period and the CoD has increased since the "on the day" estimate used at the start of the regulatory period. Hence a trailing average could provide a robust option that protects regulated firms and their customers from unexpected increases in interest rates over the regulatory period.

8.1.4 Trailing average CoD approach versus NPV neutral true-up

We have considered four key issues to consider which practical methodology to use when updating the cost of debt annually:

1) whether the objectives for shifting to an average annual CoD will be achieved through annual updates to the WACC and prices;
2) the administrative costs incurred by updating the CoD annually
3) price volatility for customers, both within and between periods.

Each is disused below in Table 1.

Table 1: Trailing average CoD versus NPV neutral true-up

	Update prices annually	NPV neutral true up at end of regulatory period
Achieving objectives of introducing a trailing average approach	All of the objectives would be achieved. Sydney Water's costs would be passed through annually and so there would be no windfall gains or losses Costs are passed through more or less immediately and so costs are more quickly observed by customers in their revised prices	Most of the objectives would be achieved. Sydney Water's costs would be passed through at the end of the regulatory period in an NPV neutral way, so there would be no windfall gains or losses Costs are not passed through until the end of the period and so customers have no opportunity to respond. However, the efficiency losses from this are only likely to be marginal as prices are not currently cost reflective with application of postage stamp pricing.
Price volatility	Exists within the period. Prices would change on an annual basis The level of price volatility will also depend on the way in which the arrangements are implemented. A transitional approach would reduce price volatility. Further, once the arrangements are fully implemented, the impact of any change in the cost of debt each year would be watered down by the other 9 years due to the averaging effect. Also, there is already a degree of volatility possible in prices. Costs associated with SDP coming into operation and bulk water transfers being required from Shoalhaven are allowed to be passed through.	Still exists between periods. Whether or not the level of volatility overall is greater or smaller than if prices are updated annually, or a single value of CoD is used across the regulatory period, will depend on the nature of the changes in the CoD. However, a true up at the end of the regulatory period could actually smooth out volatility to the extent that there are fluctuations in the cost of debt, as opposed to a consistent trend upwards or downwards. Further, any volatility could also be smoothed out by recovering the adjustment for differences between regulatory and actual CoD to be recovered across the whole of the next regulatory period. Further we believe that the annual changes in prices from the trailing average CoD are not material enough to bother with annual updates.

Administrative costs	This approach may have higher administrative costs. Sydney Water would be required to update all of its 150+ prices annually – see beginning of section 8.1.1 IPART already conducts an annual adjustment to take account of CPI and to pass through any costs associated with SDP coming into operation and bulk water transfers from Shoalhaven. The additional calculation for cost of debt could be quite mechanistical. Unlike electricity distribution businesses, Sydney Water is subject to a price cap rather than a revenue cap. This could complicate the process as Sydney Water will be required to consider how volatility in the CoD should be spread across different prices.	This approach would have low administrative costs as the process for updating prices for CoD changes would occur at the same time as the four-yearly price review is conducted.

8.2 Appendix B: Steps for selecting proxy companies

1) identify the largest reasonable set of publicly listed companies that might be useful comparators
2) exclude those companies whose equity beta could not be reliably estimated[20]
3) identify those firms that are most comparable to the benchmark firm for which a beta is to be established.[21]

In 2015, Sydney Water's expert HoustonKemp followed the below process to select proxy companies:[22]

1) Identify comparable water utilities by searching the Bloomberg database for companies that:
   a) are listed on the New York, NASDAQ, Toronto, London and Australian exchanges; and
   b) are classified as Industry Classification Benchmark (ICB) subsector 'water utilities'.
2) download daily data identified water utilities for the longest period available from Bloomberg[23].
3) For each of these companies, review the business description available on the Bloomberg database and company websites to assess the degree to which it is comparable to a benchmark water utility.
4) Where appropriate, conduct additional research by means of a desktop search.
5) Select a preferred portfolio by eliminating companies from the list of identified potential water utilities. The reasons for eliminating companies include:
   - those operating in developing countries
   - those deriving a material proportion of revenue from activities other than the provision of water and wastewater distribution services
   - there were no publicly available financial data for the utilities.

[20] Such as a company stock suffers from illiquidity or the relevant entity has been subject to a take-over offer.
[21] Such as those with a sizable proportion of assets that are subject to economic regulation; similarities in the regulatory regime; and the same or similar business activity.
[22] Houstonkemp report on Equity beta for a Benchmark Australian Water Network Service Provider, p. 8
[23] Earliest observation was in July 1980 and the most recent observation in March 2015

Sydney WATER

SW August 2017

Approximate customer impact of annual CoD updates

Base: The real post-tax WACC (with all parameters together) determined by IPART in current determinations is used for current and next determination period.

WACC	SWC & WaterNSW	SDP
Cost of Equity (CoE)	8.7%	8.9%
Cost of Debt (CoD)	6.7%	6.1%
Gearing	60%	60%
Inflation	2.5%	2.4%
Post-tax WACC	**4.9%**	**4.7%**

Impact Estimates

Updated WACC	SWC & WaterNSW	SDP
Cost of Equity	8.7%	8.9%
Cost of Debt	7.4%	7.4%
Gearing	60%	60%
Inflation	2.5%	2.4%
Post-tax WACC	**5.3%**	**5.5%**

Note: CoD = 7.41% is the highest historical value in 2009-10. Data source: Table 3.1, Incenta Economic Consulting 2016, "Melbourne Water - trailing average cost of debt"

	SWC & WaterNSW	SDP
Change in Cost of Debt	0.7%	1.3%
Change in WACC	0.4%	0.8%

Total revenue impact (nominal, $m)

Δ Revenue ($m)	Current Determination Period			Next Determination Period			
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
WaterNSW	6.5	6.8	7.0	7.5	8.2	8.8	9.5
SDP	15.8	15.7	15.7	15.7	15.7	15.7	15.6
Sydney Water	68.7	71.7	74.6	77.6	81.2	84.8	88.4
Total	**91.0**	**94.3**	**97.3**	**100.8**	**105.0**	**109.2**	**113.5**

Impact on customer bill (nominal, $/year/residential)

Residential equivalence	2.1	million
Pass thru allowed	10%	of total revenue variance

Impact pass thru to customers

(nominal, $m)	Current Determination Period			Next Determination Period			
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
WaterNSW	0.6	0.7	0.7	0.7	0.8	0.9	0.9
SDP	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Sydney Water	6.9	7.2	7.5	7.8	8.1	8.5	8.8
Total	**9.1**	**9.4**	**9.7**	**10.1**	**10.5**	**10.9**	**11.4**

Customer bill impact

($/year/residential)	Current Determination Period			Next Determination Period			
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
WaterNSW	0.3	0.3	0.3	0.4	0.4	0.4	0.5
SDP	0.8	0.7	0.7	0.7	0.7	0.7	0.7
Sydney Water	3.3	3.4	3.6	3.7	3.9	4.0	4.2
Total (nominal)	**4.3**	**4.5**	**4.6**	**4.8**	**5.0**	**5.2**	**5.4**
Total ($2017-18)	**4.3**	**4.4**	**4.5**	**4.5**	**4.6**	**4.6**	**4.7**

Conclusions (Impact of Change in Cost of Debt)

1. Using CPI = 2.5%, for the period of 2016 to 2024, the RAB values in nominal term are assumed to vary between
   WaterNSW: $1.5b - $2.5b assuming large (about doubled) capital investment in next determination period; SDP: steady at about $2b assuming no large capital investment; and S
2. 0.1% change in Cost of Debt may not trigger a change in post-tax WACC to apply for return on capitals. This is because capital structure is 60% gearing, and post-tax WACC is roun
3. 0.1% change in real post-tax WACC (minimum change) may affect Return on Capitals in nominal term between
   WaterNSW: $1.5m - $2.5m; SDP: about $2m; and SWC: $17m - $22m.
4. The analysis shows that, if CoD reaches the historical high (i.e. 7.41% as at 2009-10)
   - if 100% impact of the assumed change were to be passed through, the total revenue impact for SWC could be between $90m to $115m each year in nominal term.
   - if only 10% of these revenues are allowed to be passed through to SWC's general customers, the bill impact for a residential customer is assessed to be about $4-$5 each year.
   - note that, although RAB is at a similar magnitude (i.e. about $2b), the revenue impact of SDP is much higher than WaterNSW. This is because the CoD in current SDP determina

Key Assumptions

1. Only cost of debt is to update annually. No update on cost of equity and inflation.
2. Adjustments are not carried out on the recalibration of the entire building block model.
   - the impact of CoD on RAB (average) only was considered.
   - the followings were not considered
     - » the impact of cost of debt on tax allowance
     - » the impact of WACC on working capitals
3. The mismatch of return on capitals due to price path smoothing is not considered.

SWC: $16b - $23b with about 20% increase in capital investment.

ded to 0.1%.

ation is much lower than WaterNSW (6.1% vs 6.7%).