September 2014

Water today, water tomorrow

Consultation on the regulatory framework for the infrastructure provider that will deliver the Thames Tideway Tunnel project

Annex 3: draft guidance on the approach to the economic regulation of the infrastructure provider for the Thames Tideway Tunnel

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About this document

This guidance sets out the approach we expect to take in economically regulating the infrastructure provider (the 'IP') undertaking the Thames Tideway Tunnel Project ('the Project') – first, in setting the revenue building blocks set out in appendix 1 to the IP's project licence ('Project Licence') during the construction phase, and second, in setting revenue for the IP during the operational phase of the Project. This document is not intended to provide guidance on all regulatory issues, but rather to set out the approach we expect to adopt in setting the revenue for the IP.

We will regulate the IP in accordance with statute and the Project Licence. Where we have discretion on how we regulate, we will have regard to this guidance in exercising that discretion.

Contents

1. The legislative framework

The Flood and Water Management Act 2010 amended the Water Industry Act 1991 ('the Act') by inserting a new Part 2A, which conferred powers on the Secretary of State to make regulations about the provision of infrastructure for the use of water or wastewater undertakers.

Pursuant to the above powers, the Water Industry (Specified Infrastructure Projects) (English Undertakers) Regulations 2013 ('the SIP Regulations') were made on 27 June 2013 and they came into force on 28 June 2013. Regulation 4(1) of the SIP Regulations allows the Secretary of State or the Water Services Regulation Authority ('Ofwat') to specify an infrastructure project as a 'specified infrastructure project' that must be put out to tender. An infrastructure project is a project or part of a project in connection with designing, constructing, owning or operating infrastructure. It is a project which an incumbent water or wastewater undertaker would ordinarily carry out to fulfil its statutory duties under section 37 (general duty to maintain a water supply system, etc) or section 94 (general duty to provide a wastewater system) of the Act.

Regulation 4(3) of the SIP Regulations provides that the Secretary of State or Ofwat may only exercise the power to specify an infrastructure project if he or it is of the opinion that:

a) the infrastructure project is of a size or complexity that threatens the incumbent undertaker's ability to provide services for its customers; and
b) specifying the infrastructure project is likely to result in better value for money than would be the case if the infrastructure project were not specified, including taking into account:
    (i) the charges fixed or likely to be fixed under Chapter 1 of Part 5 of the Act (financial provisions, charges); and
    (ii) the powers of the Secretary of State under section 154B of the Act (financial assistance for major works).

The Regulations also provide that for the purpose of regulating specified infrastructure projects particular provisions of the Act apply with or without modification, and some new provisions are introduced (referred to below as 'the modified Act').

In respect of the Project and following consultation, the Secretary of State issued the Thames Tideway Tunnel Project Specification Notice (Specification Notice) on 4 June 2014 pursuant to regulation 4(1) of the SIP Regulations (and may be varied from time to time in accordance with regulation 4(7) of the SIP Regulations)

On the same date, that the Secretary of State issued the Specification Notice, he issued a Preparatory Works Notice pursuant to regulation 5(3) of the SIP Regulations identifying certain works that Thames Water was permitted or required to undertake (Preparatory Work Notice).

2. Overview of the Project

The Project is of scale, size, risk and complexity that is significantly different from projects customarily encountered in the water sector in England and Wales. For this reason, the conventional delivery and funding model in the water and wastewater sector was not considered to offer best value for money to customers and an alternative delivery model was developed by Thames Water, Ofwat and the UK Government. This alternative model is based on the traditional regulatory framework for water and wastewater undertakers but adapted for the particular characteristics of the Project – particularly during the construction phase.

Part 2A of the modified Act, and SIP Regulations, provide the statutory framework for this alternative approach. Under the SIP Regulations, the Project will be undertaken by a competitively procured third party infrastructure provider with its own shareholders, board and management. This approach is expected to provide customers with value for money through the exposure of the cost of capital to a competitive bidding process.

During the tender process we will conduct an assessment to verify that each relevant bidder is a competent body to hold the Project Licence. On completion of the tender process and selection by Thames Water of the preferred bidder it is envisaged that we will designate the preferred bidder as an infrastructure provider, and will, following a public consultation, grant the designated infrastructure provider the Project Licence under section 17F of the modified Act.

It is currently anticipated that the IP will charge Thames Water for its services under a Revenue Agreement, and Thames Water will, in turn, recover such charges from its wastewater customers. If Thames Water defaults on its obligation to pay the IP, the IP can propose to us to switch to direct charging of customers directly or indirectly connected to the Project (following the commencement of service provision to those customers). The Regulations give the IP the right to charge either the regulated incumbent wastewater undertaker, or customers. Thames Water will carry out the works set out in the Preparatory Works Notice. This work will continue beyond the IP procurement process, when Thames Water will also be responsible for implementing certain enabling and interface works that are necessary at certain sites to connect its wastewater network to the Project.

3. Ofwat's duties

In regulating the IP we will have regard to our statutory duties under sections 2(2A) and 2(3) of the Act. These include:

- protecting the interests of consumers wherever appropriate by promoting effective competition;
- securing that the functions of a licensed infrastructure provider are properly carried out;
- securing that an efficient licensed infrastructure provider is able (in particular by securing reasonable returns on its capital) to finance the proper carrying out of those functions;
- performing our regulatory duties in the manner which we consider best calculated to promote economy and efficiency on the part of licensed infrastructure provider in the carrying out of its functions;
- contributing to the achievement of sustainable development; and
- securing the long-term resilience of water supply and wastewater systems and that undertakers take steps to enable them, in the long term, to meet the need for water supplies and wastewater services.

4. IP allowed revenue during construction

As the Project will spend a number of years in construction before becoming a fully operational, we have agreed to a number of regulatory adaptations that are designed to support the IP in financing the construction of the Project at an efficient cost to customers.

The weighted average cost of capital (WACC) for the Project in the construction phase will be bid competitively by those wishing to carry out the role of the IP.

One of the benefits of the SIP Regulations and the requirement for the incumbent undertaker to competitively procure the Project is that customers will derive better value for money from the competitive process. The cost of capital will be one of the most important elements making up the IP's regulated charges. It will be a significant factor in the outcome of the procurement process to become the holder of the IP Project Licence. The outcome of the procurement is intended to be the selection of an IP that is committed to the efficient delivery of the Project.

In addition to a competitively procured cost of capital for the Project, we have encouraged robust competition in the construction phase in other areas of the IP procurement process. We have done this by adopting and adapting a number of elements of the current regulatory framework that are familiar to investors seeking utility-like risk profiles. Most notably, these include:

- the concept of a regulatory capital value ('RCV') with an accompanying linkage to the Retail Prices Index (RPI) and regulatory certainty around the remuneration of expenditure incurred;
- the determination of IP allowed revenues according to a building block approach; and
- a bespoke incentive framework to facilitate efficient costs adapted from comparable mechanisms adopted in regulated utility sectors, including water and wastewater.

We consider that the regulatory adaptations strike the right balance between our duty to protect consumers through encouraging a robust procurement and our duty to ensure that the IP can finance its functions. A number of these adaptations are important to equity investors, but the two principal safeguards for the IP – in place of the interim determination (IDoK), significant adverse effect (SAE) and significant favourable effect (SFE) mechanisms in a conventional licence – during the Project's construction phase are set out below.

- **Liquidity:** the IP will be entitled to receive revenues to finance future capital investment requirements on a forward-looking basis, subject to true-up adjustments for actual expenditure incurred. This approach should enable the IP to raise debt and equity in the construction phase on terms as close as possible to those, taking into account the nature of the Project and the package of financial support provided by the UK Government, applicable to a normally operating wholesale wastewater undertaker provided that it is operated efficiently and in compliance with the obligations placed on it under its licence. The balance between the timing and quantum of customer payments is considered in customers' overall interest;

- **Incentives:** up to an agreed level of construction cost ('the Threshold Outturn'), the IP will be remunerated for all construction costs incurred, subject to an equity incentive mechanism and the disallowance of any costs incurred through wilful misconduct or gross negligence of the IP. The equity incentive mechanism motivates the IP to deliver the Project at an efficient cost. The IP will benefit from enhanced returns to the extent it delivers the Project on schedule and outperforms the original Project target cost (and vice versa). In order to protect customers from the consequences of any overspend during construction, the IP will be subject to an administratively applied penalty directed at its post-acceptance RCV to the extent that the actual Project outturn cost exceeds the original Project target cost (including contingency) and will benefit from an administratively applied bonus to the extent that the actual outturn costs are lower than the original Project target cost. The mechanism applies irrespective of the cause of any under- or out-performance. In addition, the incentive mechanisms also contain separate disincentives for delay so that customers are not disadvantaged from overall project delays, although no incentive for early completion is provided.

Certain changes to the specification of the Project will necessitate an adjustment to the Project target cost upon which the equity incentive mechanism will operate. These changes are to the Project fixed requirements; changes to the Specification Notice; and relevant changes in law. In these circumstances, the Project Licence sets out the process by which the IP may request an adjustment to the Project target cost. In considering the appropriate amendment to the Project target cost, we will have regard to:

- our duties under the modified Act;
- the views of the independent technical assessor (which while appointed by the IP has a continuing duty of care to us to, among other things, monitor certain aspects of the construction phase of the Project); and
- any other evidence that may be relevant at the time.

In addition in the event that the Project's construction costs are forecast to exceed the Threshold Outturn, the IP may apply to us for an increase in allowed revenue (an 'IAR'), under the terms of its Project Licence, in order to increase revenues to fund the additional expenditure. In circumstances where the Threshold Outturn is forecast to be exceeded, the IP may request that the UK Government provides equity finance pursuant to a support package (the 'GSP') it has agreed to provide.

In considering the terms, on which we will grant an IAR for incremental expenditure above the Threshold Outturn, including appropriate incentives to encourage efficiency in delivery and the WACC, we will take into consideration all information available to us at the time. This includes:

- quarterly reports from the IP;
- the views and reports of the independent technical assessor (or any adjudicator);
- the accepted WACC bid by the IP in the tender process;
- market evidence on, among other things, prevailing equity market risk premium, yields on corporate debt and other financing costs; and
- the appropriate remuneration for the exposure of the IP to risk.

We, in determining the weighted average cost of capital in respect of the IAR, will not have regard to the source of any incremental funds that are provided (whether by the IP's shareholders, other private sector investors or by the UK Government under the GSP).

To the extent that the Threshold Outturn is forecast to be exceeded, the IP will be obligated to seek additional funds to complete the Project which may include funds available from under the GSP; IP investors will not be obligated to invest additional funds but would have the option to do so.

5. IP allowed revenue post construction

Shortly after the construction phase (including the period of acceptance testing), we will carry out our first operational determination of the IP's allowed revenue (the Post Construction Review). The process for the Post Construction Review is set out in the Project Licence, including the process for submission of the IP's business plan to us.

The Post Construction Review will include giving effect to the adjustments necessary to implement the regulatory incentive mechanisms in place during the construction phase as set out in the Project Licence. It is anticipated that subsequent periodic reviews carried out for the IP would coincide with those carried out for the incumbent wastewater undertaker.

In carrying out the Post Construction Review, we will balance our statutory duties, which include:

- ensuring that an efficient infrastructure provider can finance its functions; and
- protecting customers by safeguarding they pay no more than is sufficient to reward the IP and its investors for the risks they bear in delivering the outcomes they have committed to.

The Post Construction Review will only occur once the Project has been constructed and has passed acceptance testing. This is not expected to be until 2028. The exact mechanics of the approach to setting the IP's allowed revenue at the Post Construction Review (or future periodic reviews) will be influenced by any changes in policy or methodology by which the industry is economically regulated at the time the Post Construction Review or subsequent periodic reviews are carried out. We will publish and consult on our proposed methodology for the Post Construction Review and subsequent periodic reviews in the ordinary way. However, this guidance is intended to demonstrate our approach to setting the allowed revenue for the IP using our existing regulatory policies and having regard to our statutory duties.

5.1 Calculating the revenue requirement

In setting price limits we have to date followed a building block approach to determine a revenue forecast for each year for which price controls are set. The 2014 periodic review (PR14) will see us set separate price controls for retail and wholesale services. In addition, we expect to set separate wholesale controls, for

wholesale water services and for wholesale wastewater services. The wholesale control covers the technical services that companies provide – such as collecting sewage through a network of pipes from a customer's property prior to its treatment and discharge into the environment. In the absence of a more general change in the way which the industry is economically regulated, we would expect to retain this model for the IP both at the Post Construction Review and in future allowed revenue reviews.

The IP's charges are comparable to a 'wholesale wastewater charge', albeit for a precise set of services. The revenue requirement determines the amount an efficient IP should collect from customer(s) to:

- finance day-to-day operating costs;
- finance capital investment;
- provide a return on RCV; and
- meet tax liabilities as and when they arise.

At each periodic review in the IP's operational phase, the IP will be required to provide in its business plan submitted to us, its view of these components of the revenue requirement by reference to its obligations. We expect to form a view of the appropriate revenue allowances including appropriate financing costs so that that an efficient IP is able to finance the proper carrying out of its functions, including by securing reasonable returns on its capital.

5.2 Capital structure

In the absence of a fundamental change in policy or methodology by which the industry is economically regulated, our approach to remunerating both debt and equity investors is expected to be to set a real WACC which ensures that an efficient IP is able to finance the proper carrying out of its functions. We cannot confirm the exact methodology we expect to adopt in a future periodic review. However, we expect that the IP will propose a real WACC in its future business plans that balances both the requirement for the IP to be financeable and for bills to be affordable to customers.

The real WACC depends on assumptions on a capital structure. We do not, as a long-held policy, prescribe or endorse specific capital structures. The IP's capital structure during the construction and operations phases is decided and controlled by the IP and its investors, subject to the Project Licence requirements including to maintain an investment grade credit rating and subject to mandated elements of the GSP.

In price controls undertaken since privatisation, we have set a single cost of capital for a notional financial structure that reflects our view of an efficient capital structure. The cost of capital has been expressed in real terms using the weighted average of the pre-tax cost of debt and post-tax cost of equity.

For the IP, we expect to follow a similar methodology to that which we adopt for determining the cost of capital for wholesale wastewater activities at the time. We may conclude, as demonstrated in our approach to remunerating risk in water only companies (WOCs) at earlier periodic reviews, that when the IP's comparable risk profile is considered, a different notional capital structure is efficient for the IP. In this case we would then apply this notional capital structure rather than that established for wholesale wastewater undertakers. In concluding an efficient notional capital structure for the IP we would, for example, have regard to the:

- capital structure as proposed for the IP in the procurement process;
- IP's actual capital structure (and features thereof which result from mandated elements of the IP procurement process);
- proposed capital structure in the IP's business plan;
- IP's liquidity requirements;
- notional capital structure adopted for normal wholesale activities, and
- IP's exposure to risk compared to wholesale wastewater undertakers.

5.3 Cost of debt

We acknowledge that the IP must secure significant funding over a short period of time in order to finance delivery of the project from a position of an opening RCV of zero.

The IP will be incentivised to raise debt efficiently and will need the flexibility to raise both long and short term debt through the construction phase. The IP may need to refinance existing debt during the operational phase and, while the Project Licence sets the minimum requirement for a credit rating that the IP must maintain, the IP

may require a credit rating that is sufficiently within the investment grade category to enable it to access, and refinance, debt at an efficient cost. This is consistent with our expectation (and long-held policy) in respect of existing water and sewerage companies (WASCs) and WOCs.

We cannot confirm precisely our approach to setting the cost of debt at future periodic reviews. However, as evidenced by our track record in previous price determinations, we have always had regard to our primary duties, which includes our duty to secure that efficient companies can finance their functions. For instance at previous price determinations we have included a cost of debt premium for some smaller companies reflecting that they face different challenges to larger companies in accessing debt.

While we made no explicit allowance for embedded debt costs in recent price controls, our approach in assessing a fixed cost of debt assumption for the duration of the price control included consideration of the actual cost of debt (on average across the sector) in companies' balance sheets and a view of the appropriate cost of new debt (including debt raised to refinance existing debt). This took into account expected market developments, including the expected direction of future interest rate movements.

5.4 Cost of equity

At each periodic review we have used a range of evidence in assessing the appropriate cost of equity. For PR14, we have continued to use the capital asset pricing model ('CAPM') as our primary methodology in calculating the cost of equity and have estimated a forward-looking cost of capital taking account of expected market developments (for each of the three components of the cost of equity; the risk-free rate, the equity market risk premium and the equity beta).

While we cannot state precisely the mechanics we expect to use to set the cost of equity at the Post Construction Review or subsequent allowed revenue controls in the operational phase of the IP, it is expected that the cost of equity determined for the IP will reflect the atypical level of risk inherent in the IP's operational role in relation to the Project compared with the more customary level of risk associated with wholesale wastewater undertakers. Our approach would take into account our primary duties and a balanced view of risk.

5.5 Risks in the operational phase

The cost of capital at the Post Construction Review and subsequent allowed revenue will be set at a level that reflects the risks inherent in delivering the day-to-day activities of the IP.

The risks associated with the IP after the Post Construction Review when considered together may result in lower cash flow volatility and thus lower variability of expected returns, influencing the associated asset beta in assessing the appropriate cost of capital for the IP.

To demonstrate how our approach to risk, utilising the factors set out in our publication 'Setting price controls for 2015-20 – risk and reward guidance' (our 'risk and reward guidance'), we published in January 2014, may have resulted in a cost of capital at PR14 for the IP, we have set out a worked example in appendix 1. In addition, to highlight how we may approach decisions on the cost of capital in the operational phase, we have considered some examples of the factors that could be anticipated to influence the risk profile and thus the cost of capital when it is set for the IP.

Factors where the IP may, on balance, face a higher level of risk relative to a wholesale wastewater company could include the following.

- **Dependence on incumbent undertaker:** all revenues are received by the IP from the incumbent regulated wastewater undertaker Thames Water, and Thames Water receives its revenues from its wastewater customers. As such, except in specific circumstances where the IP has the ability to commence direct charging of customers, the IP will bear a degree of credit risk associated with a single customer, Thames Water (or its relevant successor) that other wholesale wastewater undertakers do not face.

- **Re-financing risks:** the long-term unchanging nature of the asset incentivises the IP to have in place stable long-term financing during the operational phase. The IP may, however, need to refinance debt arranged during construction and in operations as such debt matures. Given that a higher proportion of the IP's allowed revenue will likely be accounted for by financing costs when compared to other wholesale wastewater undertakers, equity investors could be exposed to greater risks on a change in the cost of its existing debt portfolio. This risk could provide both upside and downside to the IP; however, the IP will need to manage effectively the maturity profile of

its debt while meeting the requirement to maintain an investment grade credit rating.

- **Expenditure intensity:** the Project is the IP's only asset and it is likely there will be less on-going capital expenditure (capex) and operating expenditure (opex) associated with the Project once constructed than might otherwise be the case for a wastewater undertaker. The concentration of regulatory risk associated with the cost of capital, as the primary component of the IP's revenue requirement, may make the allowed revenue process more focused for the Project than would be the price control process for wholesale wastewater undertakers where there may be greater scope for trade-offs and outperformance on individual elements of the overall package.

Factors where the IP may, on balance, face a lower level of risk than a wholesale wastewater undertaker could include the following.

- **Operations:** operating costs are expected to be less volatile and more predictable than for a wholesale wastewater undertaker. Furthermore, as the IP will have an underlying cost structure very different from wholesale wastewater undertakers, it may be expected that the occurrence of variations in costs experienced by the IP would have a distinct impact on the IP compared to a wholesale wastewater undertaker. For instance, while the IP may have less scope to drive operating efficiencies (as operating expenditure is a relatively small component of allowed revenue) increases in operating expenditure are likely to have a lower consequential impact on equity returns.

- **Maintenance:** maintenance risks are expected to be lower than for a conventional wholesale wastewater undertaker whose infrastructure assets would be of varying age and condition. There are reduced risks associated with maintaining new assets, like those of the Project, rather than a mixture of old and new assets, and the IP will not have risks relating to the interface with the wider wastewater collection system – these remain with Thames Water. Furthermore, we consider significant major maintenance events will be predictable and capable of being planned in advance.

- **Raising financing for new capital expenditure:** with the design and operational characteristics of the Project, the IP is unlikely to need significant incremental finance to fund any major new capital expenditure in the short term.

5.6 Allowed revenue determinations in the operational phase

The IP should take comfort from our track record in our approach to determining revenue allowances at previous price determinations for WaSCs and WoCs. It should also take comfort from the fact that one of our regulatory duties is to secure that efficient companies can finance their functions, and from the protections incorporated in the regulatory framework, including allowed revenue reopening mechanisms (IDoK, SAE and SFE) which will become available to the IP and Ofwat following the Post Construction Review. In addition the IP would, following an anticipated amendment to the SIP Regulations, have the right to appeal our allowed revenue determinations to the Competition and Markets Authority.

As part of an allowed revenue determination, the cost of capital would be set on a forward-looking basis, analysing the risks and associated reasonable returns for the operation of the Project. The returns earned by investors during the construction period will not be a factor in determining the cost of capital during the operations phase of the Project.

The view expressed by external commentators, including investors and credit rating agencies, is that the regulatory system operated by us, which relies on clearly defined risk allocation principles, has been consistently applied and transparently disclosed over a number of years and has facilitated investment in the water sector. As such, investors should take comfort that our regulatory approach to the IP's allowed revenue will similarly be clearly defined, consistently applied and transparent in the operational phase.

6. Conclusion

The regulatory framework that we operate supports the construction of the Project and the IP delivery mechanism. We have reflected this in Project Licence conditions that support and incentivise the IP during the construction phase, while ensuring that customers' interests are protected and cost impacts minimised.

It is too early to give any indication of our detailed approach to allowed revenue setting after construction. However, we recognise the need to provide investors in the operational phase, with returns commensurate with the specific risks associated with the Project at that time, in fulfilment of our duty to secure that the IP can finance the proper carrying out of its functions by securing a reasonable rate of return on capital while also protecting customers' interests.

Appendix 1: Post-construction cost of capital – worked example and narrative

The cost of capital at the Post Construction Review and subsequent IP periodic reviews will be set at a level that reflects the risks inherent in delivering the day-to-day activities of the IP during the relevant price control period.

To provide an indication of how we may approach setting the IP's cost of capital post acceptance we have considered how the IP's cost of capital may have been assessed during the PR14 price control. We have done this using the parameters set out in our risk and reward guidance, and include a worked example below.

For the avoidance of doubt, this is not the cost of capital that will be applied at any IP periodic review post acceptance. This would only be established at that time in light of circumstances prevailing and taking account of our statutory duties. This includes the duty to secure that an efficient IP is able to finance its functions, as would be the case for a WaSC, a WoC or another infrastructure provider (if any)..

for PR14, the key components for setting the cost of capital are:

- gearing;
- cost of equity; and
- cost of debt.

We discuss each component in the context of how a hypothetical cost of capital for the IP for the price control period 2015-20 would be set, and should be read alongside our risk and reward guidance. Specific factors affecting the cost of capital for the IP are set out in section 5.5 above.

A1.1 Gearing

In July 2013, we published a report by PwC on the methodology for assessing the cost of capital for PR14. PwC advised retaining a notional capital structure for setting returns. It also reviewed appropriate notional capital structure assumptions. PwC concluded that a range of 60% to 70% would be an appropriate assumption for a conventionally financed WaSC or WoC.

For the purposes of our PR14 cost of capital assessment we considered that a point estimate of 62.5% was efficient for both WaSCs and WoCs and balanced the benefits of lower-cost debt financing with considerations of financeability.

For the IP a higher gearing level may ultimately be considered more efficient than the PR14 point estimate. However, this would be subject to evidence in respect of, for example, the rating agency metrics that would be applicable for the IP to maintain an investment grade credit rating post acceptance pursuant to the Project Licence. As such, in the absence of any fundamental change by the credit rating agencies of published credit metrics the same point estimate for gearing as applicable to WaSCs and WoCs is considered in this hypothetical case to be efficient for the IP.

A1.2 Cost of equity

Using the CAPM approach, the cost of equity comprises the:

- risk-free rate (RFR);
- equity market risk premium (EMRP); and
- equity beta.

The RFR and EMRP are considered to be the same for the IP as for the wider water sector at PR14 and as such no change is necessary to the assumptions published in our risk and reward guidance.

A1.3 Beta

The equity beta is the only input in the CAPM approach to the cost of equity that is sector or company specific. Since the turn of the millennium, we have discerned asset beta values predominantly in the 0.2 to 0.3 range.

However, in determining the cost of capital for PR14, we consider that relying solely on historical data for a limited number of (publically quoted) water companies is not a perfect indicator of expected beta over the PR14 period. The data illustrates some variation over time. Because of this, we have also considered the betas of other UK regulated utilities (National Grid and SSE), which lie in the range of 0.27 to 0.46 on a two-year measure of beta.

We consider that the past five years have exposed the strength of water company performance during a period of financial crisis and economic recession, and illustrated the low systemic risk of the water sector.

Analysis supports the PR14 asset beta range of 0.20 to 0.30 for the water sector and for WaSCs and WoCs we have used a point estimate of 0.30. We consider that the IP during operations would have, in comparison to a WaSC or WoC, substantially lower cash flow volatility and thus lower variability of expected returns, influencing the associated asset beta in assessing the appropriate cost of capital for the IP. A number of the factors set out in section 5.5 would be relevant in estimating the asset beta for the IP. A full analysis of these factors would need to be carried out closer to the post construction periodic review and subsequent periodic reviews to assess whether the current asset beta range would encompass the asset beta for the IP. For the purposes of the worked example we assume that the asset beta for the IP would sit at the lower end of the industry range and we use as a point estimate an asset beta of 0.20.

A1.4 Cost of debt

The real cost of debt used by Ofwat at the 2009 periodic review (PR09) was 3.6%. Since then, yields on investment grade corporate debt have fallen significantly, suggesting a lower real cost of debt is now appropriate.

For PR14, our approach in assessing a fixed cost of debt assumption for the duration of the price control includes consideration of the actual cost of debt in companies' balance sheets and a view of the appropriate cost of new debt (including debt raised to refinance existing debt). Most water company financing is long term in nature and current company debt finance costs are impacted by the cost of debt at the point of issue, which in the IP's case will be predominantly over the duration of the Project's construction.

We considered that, based on PR14 business plan submissions a ratio of 75%:25% embedded debt to new debt issued for the water sector during the PR14 period, excluding the IP, was appropriate. For the IP we recognise that, due to the nature of the asset, financing of future investment requirements may be significantly lower than that associated with a normal WaSC or WoC. As, such the level of embedded debt compared with new debt will be generally higher for the IP and will only change as embedded debt matures and is refinanced. In order to manage refinancing risk efficiently we consider that the IP will seek to spread its debt maturity over a significant period. As such, we consider for the purpose of the worked example that an initial embedded debt: new debt ratio of 90%:10% is appropriate.

A1.5 New debt issuance

For our risk and reward guidance we analysed the yields on benchmark corporate debt, using iBoxx indices of A and BBB credit rated corporate debt maturities of ten or more years alongside evidence on the current yields on traded water company bonds. We calculated a current real cost of new debt ranging from 1.8% to 2.2%, with a mid-point of 2.0%, based on a long-term RPI inflation assumption of 2.8%. Forward expectations indicate interest rates will increase during the PR14 period; therefore, our range for the real new cost of debt over PR14 is 2.6% to 2.8% and we consider that this range would equally apply to the IP for the purposes of the hypothetical indication of how the IP's cost of capital may have been assessed during the PR14 price control. In our analysis, we have continued to consider iBoxx indexes of A and BBB corporate debt maturities of 10+ years, but we note our cost of debt range is consistent with a credit rating in the BBB range.

While companies have some opportunity to take advantage of current low yields, we have allowed for future increases in corporate borrowing costs and have assumed for PR14 that new borrowing is issued throughout the 2015-20 period.

A1.6 Embedded debt

For PR14 as noted above we analysed the historical yields on benchmark corporate debt, using iBoxx indices of A and BBB corporate debt maturities of ten or more years alongside evidence on the current yields on traded water company bonds. Water companies have historically outperformed credit benchmarks through a mixture of timing their debt issuances when debt markets were cheaper and by being able to issue debt at a discount to the blended A/BBB benchmark rate. In our risk and reward guidance, we calculated a range for the real cost of embedded debt of 2.6% to 2.8%, with water company issuance towards the lower end of this range.

As water companies bear the risk relating to the timing and cost of debt issuance, we do not consider it appropriate to focus solely on these water sector benchmarks. Therefore, in our risk and reward guidance we placed more emphasis on the figures at the top end of the range which are drawn from broader corporate credit benchmarks consistent with water companies bearing performance risk. As a result, we used a point estimate of 2.75%.

We recognise that the IP's embedded cost of debt may be higher (or lower) than the sector as a whole because of some of the factors set out in section 6.5. We would expect that analysis would need to be carried out at a time closer to the relevant IP periodic review but it is likely that such factors would be taken into account in arriving at the overall cost of debt as we have for the PR14 methodology.

Table A1 Post-construction cost of capital – worked example and narrative

	PR14 risk and reward	Tideway indicative point estimate
Total equity market return	6.75%	6.75%
Risk-free rate	1.25%	1.25%
Equity market risk premium	5.50%	5.50%
Asset beta	0.300	0.200
Equity beta	0.80	0.50
Cost of equity (post-tax)	5.65%	4.18%
Cost of new debt (real)	2.65%	2.65%
Cost of embedded debt (real)	2.65%	2.65%
Ratio: embedded debt/new debt	75.00%	90.00%
Allowance for debt issuance fees	0.10%	0.10%
Overall cost of debt: pre-tax	2.75%	2.75%
Gearing (net debt:RCV)	62.50%	62.50%
Appointee (vanilla) WACC	3.85%	3.29%

Note: The indicative examples are for guidance only and may not represent the actual cost of capital which would be set for the IP following acceptance.

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