



Cost of Capital – Annual Update Report

Information Paper

Publication date: 31 May 2017





About this document

In March 2016, the UK Regulators Network (UKRN), published an information paper entitled [Cost of Capital – Annual Update Report](#)¹.

The purpose of this short information paper is to refresh last years' report, provide an update on the cost of capital decisions taken by regulators over the last year and to highlight the reasons why the decisions about certain components of the cost of capital differ from the most recent decisions made by their peers.

Participating regulators have signed up to the UKRN Cost of Capital Principles² to ensure continued collaboration on cost of capital issues. We have identified a number of ways we intend to continue to collaborate in the future³. Regulators have committed to producing and publishing an annual update report on the cost of capital decisions, which will be produced in line with the format of this report. This paper provides a summary of the most recent decisions on the weighted average cost of capital (WACC) by each regulator and an overview of some differences between determined WACCs.

This paper is not intended to put forward policy statements on behalf of any of the contributing regulators and if there appears to be a conflict between the material contained herein and an individual regulator's relevant price control papers then the individual regulator's own papers take precedence.

If you have any comments on this paper then please submit these to us through the [Contact Us](#) page on the UKRN website.

About the UK Regulators Network

UKRN is a network formed by 13 of the UK's sectoral regulators:

- The Civil Aviation Authority (CAA)
- The Financial Conduct Authority (FCA)
- Financial Reporting Council (FRC)
- the Payment Systems Regulator (PSR)
- Office of Communications (Ofcom)
- Office of Gas and Electricity Markets (Ofgem)
- Water Services Regulation Authority (Ofwat)
- Office of Rail and Road (ORR)
- Single Source Regulations Office (SSRO)
- Northern Ireland Authority for Utility Regulation (Utility Regulator)

NHS Improvement, the sector regulator for health, participates in the network and its projects as appropriate. The Water Industry Commission for Scotland (WICS) and Legal Services Board (LSB) are contributing members which generally participate as observers.

¹ UKRN also published a similar refresh paper in February 2015 – [Market Return and Cost of Capital: A Refresh](#)

² UKRN Cost of Capital Principles – <http://www.ukrn.org.uk/wp-content/uploads/2016/07/2016MarCoC-Principles.pdf>

³ UKRN Cost of Capital collaborative working – <http://www.ukrn.org.uk/wp-content/uploads/2016/07/2016MarCoC-CollaborativeWorking.pdf>



Contributors to this paper

Contributions to this paper have been made by:

- The Civil Aviation Authority (CAA)
- Office of Communications (Ofcom)
- Office of Gas and Electricity Markets (Ofgem)
- Water Services Regulation Authority (Ofwat)
- Office of Rail and Road (ORR)
- Northern Ireland Authority of Utility Regulation (Utility Regulator)

Unless explicitly mentioned any reference in this report to “the regulators” “we” or “us” relates to the six contributors listed above.



Table of Contents

1.	Summary	4
2.	Setting the cost of capital	5
3.	Principal decisions within the last 4 years (stated in real RPI adjusted terms and where the WACC is not subject to debt indexation)	9
4.	Principal decisions within the last 3 years (where WACC is applied in nominal terms and is not subject to debt indexation)	11
5.	Principal WACCs that have been determined or updated within the previous 12 months, stated in real RPI adjusted terms (including two examples where WACC is subject to debt indexation)	12
Appendix 1	Financing Duties	14
Appendix 2	Ring Fencing	17
Appendix 3	Components of cost of capital	18

I. Summary

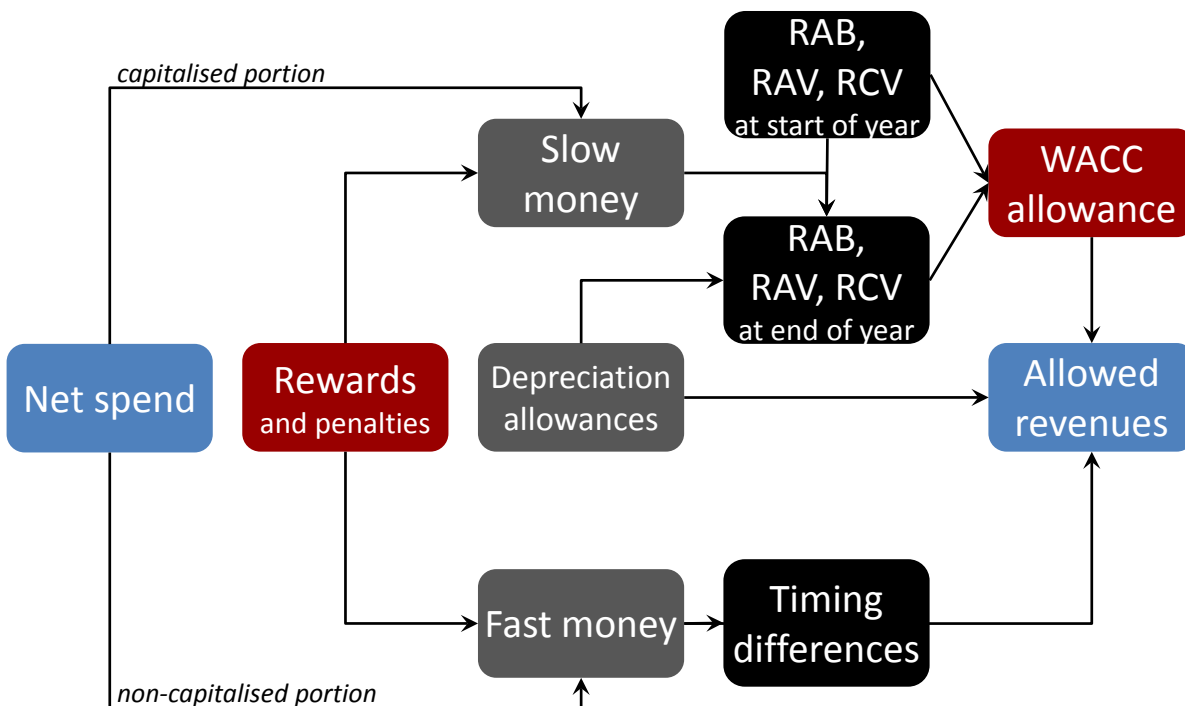
Price Controls and Cost of Capital

- 1.1. As a key tool in economic regulation many members of the UKRN establish limits on the prices regulated companies may charge to ensure that customers' bills in respect of services provided are maintained at an appropriate level. Through economic regulation and specifically price controls, the interests of customers can be protected from the consequences of insufficiently developed competition.
- 1.2. In addition to their statutory duties to customers some regulators are also required to secure that companies can finance their functions by setting an appropriate rate of return on the assets utilised in providing the regulated services. The rate of return, provided by setting a cost of capital, is considered essential to facilitate continuing investment in the infrastructure which supports the well-being of both individual customers and the wider UK economy. In assessing whether a business is and will remain financeable in delivering its regulated functions the cost of capital forms a key component of regulators' price control work.
- 1.3. Regulators independently calculate a forward looking cost of capital which can then be applied during a price control period. As such, a cost of capital may and will vary between sectors and between price controls, the length of which may also vary between regulated sectors. This is inevitable in sectors that differ in many respects – for example: the level of competition, the nature and economic life of the assets concerned, and the level of various types of risk. Regulators' statutory duties also vary. In some regulated sectors, safety or other public service objectives may be of more critical importance and the associated duties may impact how regulators fulfil their duties as well as influencing the level of the cost of capital and future trends.
- 1.4. Although the cost of capital may legitimately vary between regulated sectors, there are some components that would be expected to be similar if regulators were taking their decisions about the cost of capital at the same time and using a similar method (such as the Capital Asset Pricing Model). Each participating regulator has committed to contribute to the production of this annual update report to compare decisions regulators have made and outline some differences. In addition, the UKRN Cost of Capital Working Group support one another to make comparisons of cost of capital decisions when individual regulators are making a determination. Differences in cost of capital decisions may reflect variations in sector specific risk profiles, the timing of when decisions are made, movements in general market conditions, diverging views regarding the approach to the overall calculation of the cost of capital or a combination of these factors.
- 1.5. This paper provides a summary of the recent decisions about the cost of capital and an outline of how decisions varied between regulators. This paper covers only the principal price controls and not all decisions made by regulators.
- 1.6. Regulators have adopted the approach described in this paper in making cost of capital decisions in recent price controls. Nevertheless, it is important to note that, in future price controls, each regulator may review its approach and deviate from its established precedent in light of, for example, prevailing market conditions.

2. Setting the cost of capital

Broad Approach

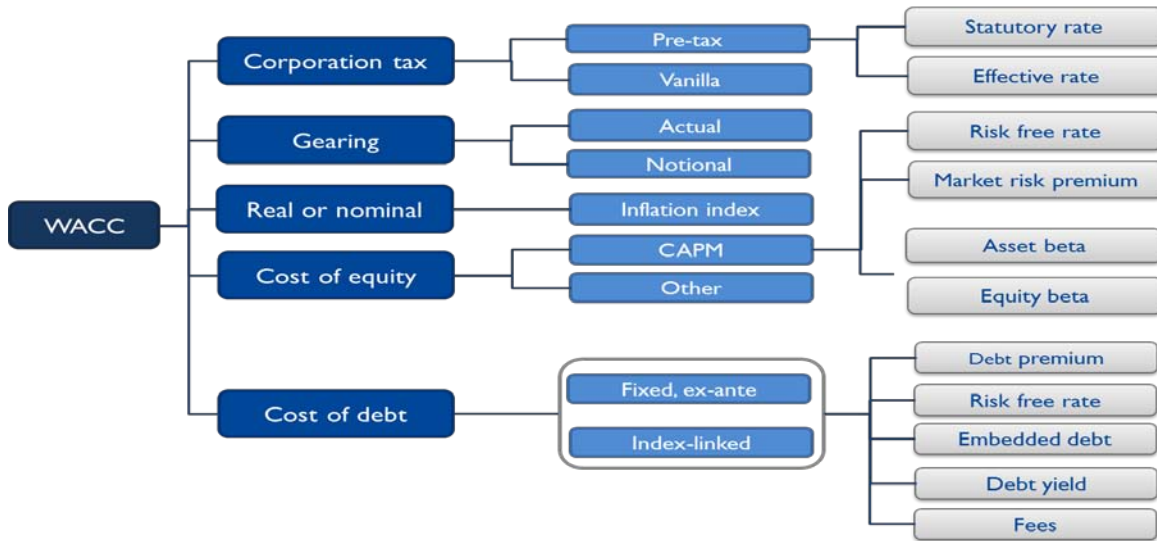
- 2.1. Whilst there are some differences in each regulator’s duties (as set out in Appendix I) we each use a cost of capital in the calculation of some, or all, of the price controls that we set for the business activities we regulate. The approaches we take in setting the cost of capital are broadly similar, although Ofcom and Ofgem take a different approach in a number of areas. The methods adopted and the differences that arise are discussed below and further detail on the parameters used in recent price controls can be found in the appendices.
- 2.2. The classic building block diagram of how price controls work and where the cost of capital fits in is set out below.



Weighted Average Cost of Capital

- 2.3. All regulators adopt a weighted average cost of capital (WACC) approach representing the cost of a blend (the gearing) of debt and equity finance.
- 2.4. The WACC is derived for a company or part of a company (the “regulated businesses”). This is usually by way of a notional gearing assumption which may be different to the actual gearing of the regulated company or its group.

2.5. The diagram below depicts ‘standard’ component analysis undertaken by regulators in order to determine a cost of capital.



2.6. The Capital Asset Pricing Model (CAPM) is used as the primary approach in estimating the cost of equity and has been reinforced by some regulators with other evidence including transaction evidence and comparison with other regulated sectors.

2.7. All regulators have used a cost of capital which can be expressed in real terms (which is applied for price control purposes to a regulatory asset base (RAB), regulatory asset value (RAV) or regulatory capital value (RCV)); although for some price controls Ofcom has used a nominal cost of capital, while Ofgem utilises a modified approach to reflect the impact of a longer price control period.

2.8. Further information about the approach to calculating individual components of the WACC can be found in Appendix 3.

Principal controls for which a cost of capital is set

2.9. The table below highlights the different principal price controls the regulators set and the duration of the current controls.

Regulator	Sector	Principal price control	Duration of the current control	Notes
CAA	Airports	Q6 – Heathrow	5 years and 9 months	I
	Airports	Q6 – Gatwick	7 years	
	Air traffic control	RP2 – NATS (En Route) plc (NERL)	5 years	
Ofcom	Telecoms	Leased lines charge control (LLCC)	3 years	
	Telecoms	Mobile call termination (MCT)	3 years	
	Telecoms	Wholesale local access (WLA)	3 years	
	Telecoms	Wholesale broadband access (WBA)	3 years	
	Telecoms	Narrowband	3 years	

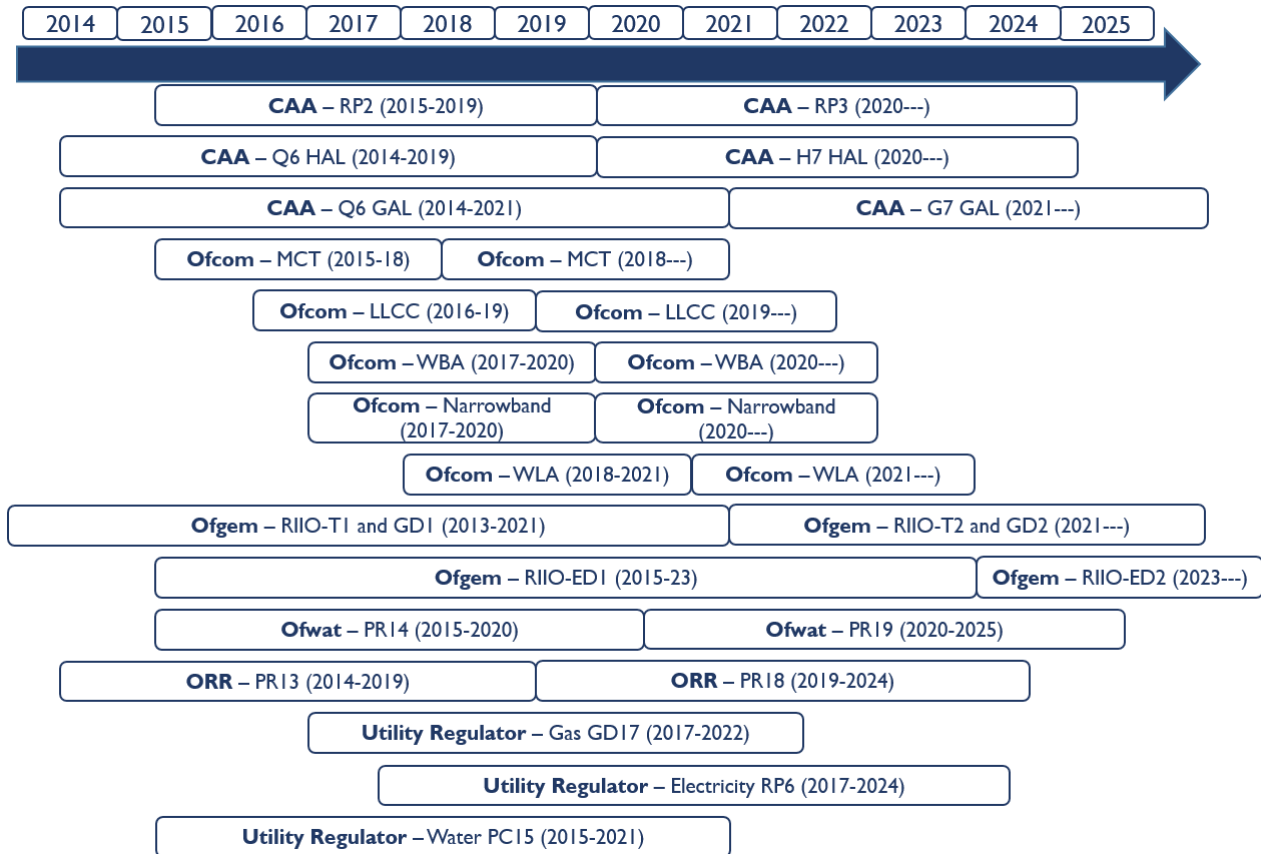
Regulator	Sector	Principal price control	Duration of the current control	Notes
Ofgem	Gas & Electricity	RIIO-T1 – Transmission	8 years	
	Gas	RIIO-GDI – Gas distribution	8 years	
	Electricity	RIIO-EDI – Electricity distribution	8 years	
Ofwat	Water & wastewater	PR14 – wholesale water	5 years	
	Water & wastewater	PR14 – wholesale wastewater	5 years	
	Water & wastewater	PR14 – household retail	5 years	
	Water & wastewater	PR14 – non-household retail	5 years	2
	Water & wastewater	Thames Tideway Tunnel	15 years	
ORR	Rail network	CP5 – Network Rail	5 years	
	High speed rail	CP2 – HSI	5 years	3
Utility Regulator	Gas	GD17	6 years	
	Electricity	RP6	6 years and 6 months	
	Water	PCI5	6 years	

Notes

1. In December 2016, the CAA extended the current price control for Heathrow for one year, from 4 years and 9 months to 5 years and 9 months.
2. The non-household retail market was opened to competition in England on 1 April 2017. Therefore, in future, Ofwat will only be setting a non-household retail control in Wales.
3. HSI is a concession that is subject to a different regulatory framework. In particular, it is not in the scope of CP2 to calculate a return to shareholders as part of the revenue requirement calculation, therefore HSI is not included in the subsequent sections of this document. Nevertheless, some of the issues involved with calculating a cost of capital do apply to HSI.

Recent and upcoming principal price reviews

2.10. The chart below shows the recent and upcoming principal price reviews for each of the regulators involved in the cost of capital working group all of whom have signed up to the UKRN cost of capital principles.



Decisions on WACC components

2.11. The following sections present the decisions on cost of capital components in recent principal controls:

- Section 3 summarises principal WACC decisions over the past 4 years that are expressed in real RPI adjusted terms with the WACC not subject to debt indexation. It does not include decisions made by Ofgem, as Ofgem updates cost of debt allowances on an annual basis.
- Section 4 summarises principal WACC decisions that are applied in nominal terms and not subject to debt indexation. It outlines decisions made by Ofcom.
- Section 5 summarises principal WACC decisions stated in real RPI adjusted terms over the past 12 months. It outlines decisions made by Ofgem, and includes decisions made by Ofcom and the Utility Regulator for comparison purposes.



3. Principal decisions within the last 4 years (stated in real RPI adjusted terms and where the WACC is not subject to debt indexation)

Date	Oct-13	Feb-14	Feb-14	Feb-14	Mar-14	Jun-14	Jun-14	Dec-14	Dec-14	Feb-15	Oct-15	Apr-16	Apr-16	Sep-16
Regulator	ORR	CAA	CAA	CAA	CC	Ofcom	Ofcom	Ofwat	UR	Ofcom	CMA	Ofcom	Ofcom	UR
Sector	Rail network	Airports	Airports	Air traffic control	NI Electricity	Telecoms	Telecoms	Water & sewerage	Water & sewerage	Telecoms	Water	Telecoms	Telecoms	Gas
Price control	CP5	Q6 – Heathrow	Q6 – Gatwick	NERL	RP5	LLU WLA	WBA	PR14	PC15	MCT	CMA –Bristol Water	LLCC	LLCC	GD17 – PNGL
Source	See (p.491)	See (e.g. p.44)	See (e.g. p.44)	See (e.g. p.151)	See (p.13-38)	See (Table A14.1 'Openreach')	See (Table A14.1 'Rest of BT')	See (p. 41)	See (p.10)	See (Table A10.1 'January 2015')	See (p.335)	See (Table A30.1 'Openreach copper')	See (Table A30.1 'Other UK telecoms')	See (Table 192)
Cost of debt (pre-tax)	3%	3.20%	3.20%	2.45%	3.10%	2.3%	2.8%	2.59%	1.2%	2.1%	2.6%	2.1%	2.2%	2.36%
Risk free rate	1.75%	0.50%	0.50%	0.75%	1.50%	1.3%	1.3%	1.25%	1.5%	1.0%	1.3%	1.0%	1.0%	1.25%
Equity risk premium	5.00%	5.75%	5.77%	5.50%	5.00%	4.8%	4.8%	5.50%	5.0%	5.1%	5.3%	5.1%	5.1%	5%
Equity beta	0.95	1.10	1.13	1.11	0.70	0.69	1.17	0.80	0.83	0.93	0.85	0.74	0.96	0.77
Asset beta	0.37	0.50	0.56	0.50	0.40	0.50	0.83	0.30	0.44	0.60	0.32	0.55	0.70	0.40
Cost of equity (post-tax)	6.5%	6.84%	7.0%	6.86%	5.00%	4.6%	7.0%	5.65%	5.7%	5.8%	5.7%	4.8%	5.9%	5.3%
Gearing	62.5%	60%	55%	60%	45%	32.0%	32.0%	62.5%	50.0%	40.0%	62.5%	30.0%	30.0%	55%
Tax	20.2%	20.2%	20.2%	36%	20%	20.0%	20.0%	20%	20.0%	20.0%	20.0%	19.0%	19.0%	20%
WACC (pre-tax)	4.93%	5.35%	5.70%	5.75%	4.83%	5.19%	7.34%	4.27%	4.14%	5.63%	4.32%	5.29%	6.29%	4.26%
WACC (Vanilla)	4.31%	4.65%	4.90%	4.22%	4.15%	3.88%	5.62%	3.74%	3.44%	4.29%	3.78%	3.98%	4.80%	3.67%
Notes														2,3

Notes

1. Ofcom publish and apply WACC in nominal terms, therefore in the table above we have converted those figures into real terms by reference to their stated RPI assumptions of 3.2% for 2014 and 3.3% for 2015 & 2016. Ofcom also publish and apply WACC in pre-tax terms, however, unlike other regulators, Ofcom account for tax in nominal terms by grossing up the nominal cost of equity. The equivalent nominal values that Ofcom published are reproduced at section 4 below. In addition to WACC for charge controls, Ofcom also considers WACC for other issues, such as in considering Royal Mail's financial viability and in determining financial terms for broadcasting and spectrum licences.
2. UR determined an ex post adjustment mechanism which updates the WACC using benchmark rates at the points in time when the companies raise new debt.
3. UR decided a pre-tax WACC of 4.32% for Firmus Energy but this analysis is excluded from the table due to an appeal to the Competition and Markets Authority.



- 3.1. In August 2015, Ofwat accepted for the construction phase of the Thames Tideway Tunnel project a cost of capital of 2.497% (vanilla) which is fixed until 2030. The cost of capital bid by Bazalgette Tunnel Limited, which is lower than that determined by Ofwat for water and wastewater companies at PR14, reflects both the absence of pre-existing embedded debt costs and the inclusion of bespoke licence features during the construction phase including a liquidity allowance and a cost of debt indexation mechanism. As this cost of capital was established as part of a competitive tendering process and individual components were not set by Ofwat, we have excluded this from the analysis above.
- 3.2. The table above includes a simplified approach to corporation tax where the rates used are those stated by each regulator's determination whereas in reality some of the regulators update the corporation tax rate for prevailing rates.

4. Principal decisions within the last 3 years (where WACC is applied in nominal terms and is not subject to debt indexation)

Date	Jun-14	Jun-14	Feb-15	Apr-16	Apr-16
Regulator	Ofcom	Ofcom	Ofcom	Ofcom	Ofcom
Sector	Telecoms	Telecoms	Telecoms	Telecoms	Telecoms
Price control	LLU WLA	WBA	MCT	LLCC	LLCC
Source	See (Table A14.1 'Openreach')	See (Table A14.1 'Rest of BT')	See (Annex 10)	See (Table A30.1 'Openreach copper')	See (Table A30.1 'Other UK telecoms')
Cost of debt (pre-tax)	5.5%	6.0%	5.4%	5.4%	5.5%
Risk free rate	4.5%	4.5%	4.3%	4.3%	4.3%
Equity risk premium	5.0%	5.0%	5.3%	5.3%	5.3%
Equity beta	0.69	1.17	0.93	0.74	0.96
Cost of equity (pre-tax)	10.0%	13.0%	11.6%	10.2%	11.6%
Gearing	32.0%	32.0%	40.0%	30.0%	30.0%
Tax	20.0%	20.0%	20.0%	19.0%	19.0%
WACC (pre-tax)	8.6%	10.8%	9.1%	8.8%	9.8%

- 4.1. Since the publication of the last report on cost of capital by the UKRN, Ofcom has made a decision on the cost of capital for [Leased Lines Charge Controls](#). Ofcom set nominal pre-tax WACCs of 8.8% (Openreach copper) and 9.8% (Other UK Telecoms) which are equal to 3.98% and 4.80% on a real (RPI discounted) vanilla basis using its method of accounting for tax in nominal terms (Ofcom gross up the nominal cost of equity to account for tax costs).

5. Principal WACCs that have been determined or updated within the previous 12 months, stated in real RPI adjusted terms (including two examples where WACC is subject to debt indexation)

Date	Apr-16	Sep-16	Nov-16	Nov-16
Regulator	Ofcom	UR	Ofgem	Ofgem
Sector	Telecoms	Gas	Electricity	Electricity
Price control (group)	LLCC	GD17 – PNGL	RIIO-TI/GDI	RIIO-EDI
Source 1	See (Table A30.1 'Other UK telecoms')	See (Table 192)	See ('Inputs')	See ('Inputs')
Source 2			See (Table 3.5)	See (Page 1)
Source 3			See (model)	See (model)
Cost of debt (pre-tax)	2.2%	2.36%	1.49% – 2.22%	2.22% – 2.29%
Risk free rate	1.0%	1.25%	2.0%	Note 1
Equity risk premium	5.1%	5.3%	5.3%	Note 1
Equity beta	0.96	0.77	0.9 - 0.95	Note 1
Cost of equity (post-tax)	5.9%	5.3%	6.7% – 7.0%	6.0% – 6.4%
Gearing	30.0%	55%	55% – 65%	65.0%
Tax	19.0%	20%	19.0%	19.0%
WACC (Vanilla)	4.80%	3.67%	3.79% – 4.37%	3.68 – 3.59%
WACC (pre-tax)	6.29%	4.26%	N/A	N/A
Notes			1,3	1, 2, 3

Notes

1. Ofgem updates allowances for the cost of debt on an annual basis to reflect changes in benchmark rates. The table above shows the cost of debt allowances for 2017-18 determined for the RIIO-TI/GDI and EDI price controls in the November 2016 annual iteration process. Cost of equity estimates were determined in 2012 for RIIO-TI/GDI and 2014 for RIIO-ED-I and are fixed for the duration of the respective price controls.
2. Ofgem's decision making board, GEMA, noted in its RIIO-EDI slow track decision that there was significant uncertainty in all the numbers contributing to the WACC and that it was not therefore the intention to achieve a precise match to the actual WACC and its components for the electricity distribution network operators as this would represent spurious accuracy. Accordingly, Ofgem has not published a point estimate of all the individual components of its WACC allowances. The RIIO-EDI decision provided for a cost of equity of 6.0% for slow track companies. Business plans for the fast tracked companies had been accepted on the basis of a cost of equity of 6.4%.
3. Ofgem's allowances for corporation tax are subject to a 'tax trigger' mechanism that provides for material changes in the tax regime, including changes in corporation tax rates. The rate of corporation tax for 2017-18 is 19%.



- 5.1. The cost of debt for Ofcom LLCC is slightly lower than the cost of debt established by both Ofgem and UR. This lower cost of debt reflects the cost of debt facing BT & comparator companies including the movement in the debt markets and an inflation assumption of 3.3%.
- 5.2. Ofcom's LLCC real vanilla WACC is higher overall reflecting both:
 - the lower level of gearing used by Ofcom compared with that used by both UR and Ofgem.
 - the higher systematic risk associated with telecoms compared to gas or electricity.
- 5.3. UR determined a pre-tax WACC of 4.32% for Firmus Energy but this analysis is excluded from the table due to an appeal to the Competition and Markets Authority.



Appendix I Financing Duties

Table A1: Summary of each regulator's duties regarding financeability in the context of their other responsibilities

Regulator	CAA	Ofcom	Ofgem	Ofwat	ORR	Utility Regulator				
Sector	Air Traffic Control	Airports	Telecoms	Gas	Electricity	Water & sewerage	Rail network	Water & sewerage	Electricity	Gas
No. of companies subject to price controls	1	2	5 (Note 1)	9 (Note 2)	17 (Note 2)	19 (Note 3)	2 (Note 4)	1	2	4
Primary legislation	Transport Act 2000	Civil Aviation Act 2012	Communications Act 2003	Gas Act 1986	Electricity Act 1989	Water Industry Act 1991 as amended	Railways Act 1993 (plus amendments)	Water and Sewerage Services (NI) Order 2006	The Electricity (NI) Order 1992 & Energy Order (NI) 2003	The Gas (NI) Order 1996 & Energy Order (NI) 2003
Structure of Duties	Primary duty and 'have regard to...'	Primary duty and 'have regard to...'	Primary duty and 'have regard to...'	Primary duty and 'have regard to...'	Primary duty and 'have regard to...'	4 primary and 5 secondary duties	Statutory duties to funders, business and users. No hierarchy in duties	Core duties (3 primary, 5 secondary duties plus general environmental and recreational duties) and 'have regard to...'	Primary duty and 'have regard to...'	Primary duty and 'have regard to...'
Financing duty?	Yes, must have regard to ...	Yes, must have regard to ...	No	Yes, must have regard to ...	Yes, one of the primary duties	Yes, one of the primary duties	Yes, must act in a manner which it considers will not render it unduly difficult for licence holders to finance their activities	Yes, one of the primary duties	Yes, must have regard to the need to secure that licence holders are able to finance their statutory activities	Yes, ensure the company can finance its activities
Economy and/or efficiency duty?	Yes, must have regard to ...	Yes, must have regard to ...	No	Yes, must have regard to ... when carrying out its functions	Yes, one of the secondary duties	Yes	Yes	Yes, one of the secondary duties	Yes	Yes

Regulator	CAA	Ofcom	Ofgem	Ofwat	ORR	Utility Regulator				
Sector	Air Traffic Control	Airports	Telecoms	Gas	Electricity	Water & sewerage	Rail network	Water & sewerage	Electricity	Gas
Primary duty / duties	Maintain a high standard of safety, which has priority over other 'secondary' duties	Further the interests of users, where appropriate promote competition	Further the interests of citizens in relation to communication matters and to further the interests of consumers in relevant markets where appropriate by promoting competition	Further the principal objective: – the shipping, transportation or supply of gas conveyed through pipes; – the generation, transmission, distribution or supply of electricity; – and the provision or use of electricity interconnectors... where appropriate by promoting effective competition	Secure that the functions of each undertaker are properly carried out Secure that they are able to finance their functions, in particular by securing reasonable returns on their capital Protect the interests of consumers, wherever appropriate by promoting competition 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	No primacy within ORR's duties	Protection of consumer interests (wherever appropriate by facilitating effective competition) Ensuring undertakers are able to finance their functions Ensuring undertakers carry out their functions properly as respects every area of Northern Ireland	Principal objective is to protect the interests of electricity consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities, connected with, the generation, transmission, distribution or supply of electricity	Principal objective is to promote the development and maintenance of an efficient, economic and coordinated gas industry in Northern Ireland The principal objective must also be pursued in a way that is consistent with the objectives defined in Article 40 of the Gas Directive, the most relevant of which – in the context of carrying out price controls – are promoting an efficient market, and protecting consumers In carrying our gas functions, we are also required to further this principal objective in the best manner that we see fit whilst also having regard to a number of other considerations. The key relevant one being the need to ensure that licence holders are able to finance their licensed activities	



Notes

1. Ofcom: Ofcom has additional duties under the Postal Services Act 2011 (PSA11) when carrying out functions in relation to postal services. These state that Ofcom must carry out such functions in a way that it considers will secure the provision of a universal postal service. In performing this duty, Ofcom must have regard to the need for the provision of a universal postal service to be financially sustainable, and the need for the provision of a universal postal service to be efficient before the end of a reasonable period and for its provision to continue to be efficient at all subsequent times.
2. Ofgem: Excluding independent gas transporters and independent electricity distribution network operators who are subject to relative price control.
3. Ofwat: The 18 license holders referred to are the 10 regional companies that provide both water and sewerage services and the 8 regional companies that provide water services only. Each of these companies is subject to the full period review price determinations process. Ofwat also regulates, albeit with a lighter process, 6 local companies providing either water or sewerage services or both; and 7 water supply licensees offering water services to large use customers. Ofwat also regulate the infrastructure provider in connection with the Thames Tideway Tunnel.
4. ORR: As well as Network Rail, ORR conducts a periodic review of HSI Ltd.'s charges. HSI is a concession that is subject to a different regulatory framework. In particular, it is not in the scope of HSI's price control to calculate a return to shareholders as part of the revenue requirement calculation, therefore HSI is not included in this document. Nevertheless, some of the issues involved with calculating a cost of capital do apply to HSI.



Appendix 2 Ring Fencing

Table A2: Summary of each regulator's ring fencing provisions

Regulator	CAA		Ofcom	Ofgem		Ofwat	ORR	Utility Regulator		
	Air Traffic Control	Airports	Telecoms	Gas	Electricity	Water & sewerage	Rail network	Water & sewerage	Electricity – NIE	Gas
Restrictions on disposal of assets	✓	×	×	✓	✓	✓	✓	✓	✓	✓ / ✗
Restrictions on activity and financial ring fencing	✓	✓	×	✓	✓	✓	✓	✓	✓	✓ / ✗
Requirement to annually provide certification of availability of resources and at each dividend declaration	✓	✓	×	✓	✓	✓	✓	✓	✓	✓ / ✗
Ultimate holding company undertakings	✓	✓	×	✓	✓	✓	✓	N/A	✓	✓ / ✗
Requirement to maintain an investment grade credit rating	✓	×	×	✓	✓	✓	✓	Deferred given deferral of domestic charging	✓	✓ / ✗
Restrictions on indebtedness	✓	×	×	✓	✓	×	✓	Guidelines provided but no restrictions as such	✓	✓ / ✗
Independent licensee directors	×	×		✓	✓	✓				
Restrictions on granting of security over network assets	✓	×	×	✓	✓	✓	✓	N/A	✓	✓ / ✗
Insolvency	Special admin	No special admin., standard insolvency rules	No special admin., standard insolvency rules	Special admin	Special admin	Special admin	Special admin	Special admin	✓	Special admin
Notes		1								2

Notes

1. Airport licences for Heathrow Airport Limited and Gatwick Airport Limited issued by the CAA in February 2014, which took effect on 1 April 2014.
2. Dependent on the ownership structure (private or government owned) of the licensed business, which is currently under review.

Appendix 3 Components of cost of capital

WACC

All regulators calculate a weighted average cost of capital (WACC) to calculate a return for investors which represents the cost of a blend (the gearing) of debt and equity finance.

One of the most common calculations of WACC is a “vanilla” WACC which is calculated using the formula below, where gearing is the ratio of debt to equity

$$\text{WACC} = (\text{Cost of Debt} \times \text{Gearing}) + (\text{Cost of Equity} \times (1 - \text{Gearing}))$$

In the calculation above, the cost of debt is calculated pre-tax, while the cost of equity is a post-tax figure.

Alternatively regulators may elect to use a “fully post-tax” WACC, which is calculated as follows:

$$\text{WACC} = (\text{Cost of Debt} \times 1 / (1 - \text{tax rate}) \times \text{Gearing}) + (\text{Cost of Equity} \times (1 - \text{Gearing}))$$

The choice as to which approach to take is sector specific and will depend on the structure of companies within each sector and the level of tax which is paid in the sector. The regulator selects an approach which provides an appropriate tax allowance which covers companies’ tax costs while ensuring that customers are not being asked to pay for a tax allowance where no tax is being paid due to the company’s use of available tax allowances.

Gearing

Gearing is a company’s debt expressed as a percentage of its total capital. In regulated utilities this is usually calculated as debt as percentage of its regulated asset base (RAB), regulated asset value (RAV) or regulated capital value (RCV). Other common measures include the ratio of debt to (debt plus equity) expressed as a percentage.

When setting prices most regulators use an assumed notional capital structure and a notional level of gearing.

Cost of Equity

The minimum expected return that equity investors require to prompt them to invest in companies, taking account the risks involved.

The Capital Asset Pricing Model (CAPM) is used as the primary approach in estimating the cost of equity and is reinforced with evidence from the dividend growth model, transactional evidence and comparisons with other regulated sectors.

Under the CAPM approach, the cost of equity is estimated as the risk-free rate plus (equity beta x market risk premium). The risk-free rate and the market risk premium are general non-company specific market factors.

Risk-Free Rate

The theoretical rate of return on an investment with zero risk. The risk free rate can be calculated as either a historical value or under a current market approach. Most regulators use a current market approach which looks at forward rates for gilts of differing maturities to assess the risk free rates. Regulators will also use the historic rates on government gilts to cross check the results.



Market Risk Premium

The market risk premium is a measure of the expected return, on top of the risk-free rate, that an investor would expect when holding the market portfolio. This captures the non-diversifiable risk that is inherent to the market.

Regulators employ two differing methodologies for calculating the market risk premium. They either use a standalone estimate using market indices or calculate it as the residual of the equity market return after deducting the risk free rate.

Betas

The equity beta is a company or sector-specific factor which describes the relative risk of the company or sector to the market as a whole, so variation between sectors is to be expected. The existence of directly measureable betas will depend on whether there are regulated companies with equity listings.

Cost of Debt

The cost of debt is the minimum expected return that providers of debt finance require to prompt them to lend to companies, taking into account the risks involved.

The approach to calculating a cost of debt varies between regulators but often considers the cost of embedded debt and the cost of new debt. The cost of debt is calculated using market data on traded bonds as the primary source of evidence.

The UKRN also publish a Cost of Capital [terminology buster](#) on its website.