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Cost of capital determination for disclosure year 2018 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end)

[2017] NZCC 19

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Associated documents

Publication date	Reference	Title
28 February 2017	ISSN 1178-2560	Transpower Input Methodologies Determination 2010
28 February 2017	ISSN 1178-2560	Gas Distribution Services Input Methodologies Determination 2012 (Consolidated February 2017)
28 February 2017	ISSN 1178-2560	Gas Transmission Services Input Methodologies Determination 2012
20 December 2016	ISSN 1178-2560	Airport Services Input Methodologies Determination 2010 (Consolidated December 2016)
31 July 2015	ISSN 1178-2560	Cost of capital determination for information disclosure year 2016 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2015] NZCC 20
31 July 2014	ISSN 1178-2560	Cost of capital determination for information disclosure year 2015 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2014] NZCC 19
31 July 2013	ISBN 978-1-869453-19-0	Cost of capital determination for information disclosure year 2014 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2013] NZCC 12
30 July 2012	ISBN 978-1-869452-10-0	Cost of capital determination for information disclosure year 2013 for Transpower, gas pipeline businesses and specified airport services (with a June year-end) [2012] NZCC 20
8 July 2011	ISBN 978-1-869451-60-8	Determination of the Cost of Capital for Information Disclosure Year 2012 for Transpower New Zealand Limited, Suppliers of Gas Pipeline Services, and Suppliers of Specified Airport Services (June year-end) Decision Number 727

Commerce Commission
Wellington, New Zealand

Executive summary

1. This determination specifies weighted average cost of capital (WACC) estimates to apply for disclosure year 2018 for:

   1.1 Transpower New Zealand Limited (Transpower);

   1.2 First Gas' Gas distribution businesses and Gas transmission businesses with a financial year ending in September;

   1.3 gas pipeline businesses with a financial year ending in June (Vector GDB and GasNet GDB); and

   1.4 suppliers of specified airport services with a financial year ending in June (Auckland International Airport Limited (AIAL) and Christchurch International Airport Limited (CIAL)).

2. The WACC estimates are summarised in Table 1 below. The WACCs are estimated as at 1 July 2017.

3. For the purpose of this determination, the vanilla WACC is a weighted average of the pre-corporate tax cost of debt and the post-tax cost of equity. The post-tax WACC is the weighted average of the post-corporate tax cost of debt and the post-tax cost of equity.

Transpower

4. Vanilla and post-tax WACCs have been estimated for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017). Mid-point, 25th percentile, 67th percentile and 75th percentile WACC estimates have also been determined for Transpower.[1]

First Gas

5. Vanilla and post-tax WACCs have been estimated for First Gas' GTB and GDB for the five year period commencing on the first day of the year from 1 July 2017. This estimate will be applied for information disclosure by First Gas for the three month period commencing 1 July 2017. Mid-point, 25th percentile, 67th percentile and 75th percentile WACC estimates have also been determined for First Gas.[2]

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[1] The IM Review change in WACC methodology that applies to Transpower for disclosure year 2019 will not apply until we amend the Transpower ID determination. We anticipate amending the Transpower ID determination before 1st July 2018. Assuming that the Transpower ID determination will be amended before 1st July 2018, our next ID WACC determination will use the IM Review change in WACC methodology.

[2] The period commencing 1 July 2017 is the residual three month portion of disclosure year 2017 that brings First Gas up to its new 30 September regulatory balance date that we recently updated. The IM Review change in WACC methodology that applies to First Gas for disclosure year 2018 will not apply until we estimate WACC rates for the disclosure year commencing 1 October 2017.

Other Gas distribution businesses

6. Our determination reflects the IM amendments determinations made as a result of our 2016 IM Review.[3] In accordance with the decisions under the IM Review we have estimated vanilla and post-tax WACCs for Vector's GDB and GasNet's GDB for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017). Mid-point, 25th percentile, 67th percentile and 75th percentile WACC estimates have also been determined for these other GDBs.

Airports

7. Our determination reflects the IM amendments determinations made as a result of our 2016 IM Review.[4] In accordance with the decisions under the IM Review we have estimated vanilla and post-tax mid-point estimates of WACC.[5]

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3 Commerce Commission, Input Methodologies review decisions, Report on the IM review, 20 December 2016, pp.59-65.

4 Commerce Commission, Input Methodologies review decisions, Report on the IM review, 20 December 2016, pp.72-77.

5 Commerce Commission, Input Methodologies review decisions, Topic paper 6 WACC percentile for airports, 20 December 2016.

Table 1: Summary of vanilla and post-tax WACC estimates (%)

	Mid-point	25th percentile	67th percentile	75th percentile
Transpower disclosure year 2018				
Vanilla WACC	5.29	4.57	5.75	6.00
Post-tax WACC	4.75	4.03	5.21	5.46
First Gas disclosure year 2017 (three month period)				
Vanilla WACC	5.99	5.18	6.52	6.80
Post-tax WACC	5.45	4.64	5.98	6.26
GDB Vector and GasNet disclosure year 2018				
Vanilla WACC	5.73	5.02	6.19	6.44
Post-tax WACC	5.20	4.49	5.66	5.91
Specified airport services disclosure year 2018 (AIAL and CIAL)				
Vanilla WACC	6.41	-	-	-
Post-tax WACC	6.19	-	-	-

Introduction

8. This determination specifies WACC estimates to apply for:

    8.1 Transpower disclosure year 2018, with a financial year ending in June;

    8.2 First Gas' GDB and GTB disclosure year 2017, with a financial year ending in September;

    8.3 GDBs subject to regulation under Part 4 of the Commerce Act 1986 (the Act) disclosure year 2018, with a financial year ending in June (Vector GDB and GasNet GDB); and

    8.4 suppliers of specified airport services (as defined in section 56A of the Act) disclosure year 2018, with a financial year ending in June (AIAL and CIAL).

9. The WACC estimates are determined under:

    9.1 clauses 2.4.1 to 2.4.11 of the Transpower Input Methodologies Determination (the Transpower IM Determination);[6]

    9.2 clauses 2.4.1 to 2.4.11 of the Gas Distribution Services Input Methodologies Determination 2012 (the GDS IM Determination) for First Gas' GDB[7], clauses 2.4.1 to 2.4.9 of the GDS IM Determination for Vector's GDB and GasNet's GDB,[8] and clauses 2.4.1 to 2.4.11 of the Gas Transmission Services Input Methodologies Determination 2012 (the GTS IM Determination);[9] and

    9.3 clauses 5.1 to 5.7 of the Airport Services Input Methodologies Determination 2010 (consolidated as of 20 December 2016)[10]

10. We have estimated both vanilla and post-tax WACCs. The vanilla WACC is a weighted average of the pre-corporate tax cost of debt and the post-tax cost of equity. The post-tax WACC is a weighted average of the post-corporate tax cost of debt and the post-tax cost of equity.

11. The parameter values, estimates and information sources used for each estimate of the WACC are set out in this determination. Additional commentary on the estimation of the risk-free rate and the debt premium is also provided.

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6 *Transpower Input Methodologies Determination* [2012] NZCC 17, as subsequently amended and included in the latest consolidated determination (28 February 2017), clauses 2.4.1 to 2.4.11 of Appendix Part 2.

7 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clauses 2.4.1 to 2.4.11 of Appendix Part 2.

8 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clauses 2.4.1 to 2.4.9.

9 *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 28, as subsequently amended and included in the latest consolidated determination (28 February 2017), clauses 2.4.1 to 2.4.11 of Appendix Part 2.

10 *Airport Services Input Methodologies Determination* [2010] consolidated as of 20 December 2016.

12. This determination identifies the issuers and bonds that were analysed (including the credit rating and remaining term to maturity) when estimating the debt premium for Transpower and airports.

Background

Changes in the risk-free rate and debt premium over time

13. The cost of capital input methodologies for the regulated services reflect that both the risk-free rate and the debt premium on bonds change over time.[11]

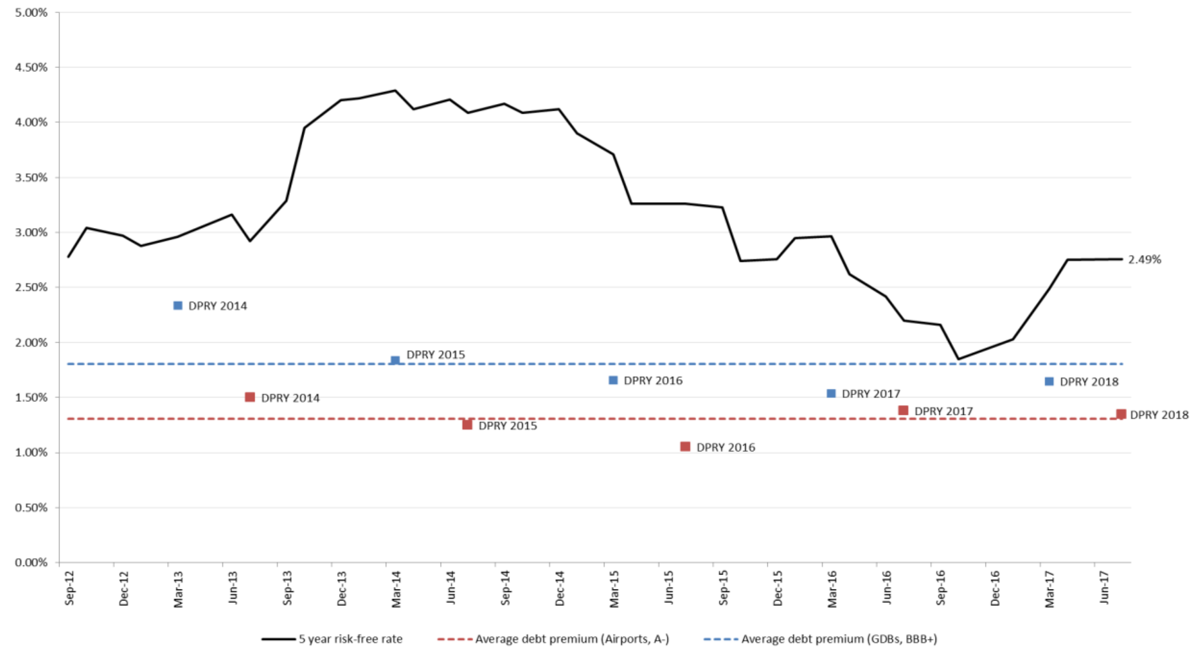
14. Changes in the risk-free rate and debt premium on bonds are illustrated below. Figure 1 shows the changes over time in the:

    14.1 five year risk-free rate;

    14.2 debt premium on bonds rated BBB+ with a term of five years; and

    14.3 debt premium on bonds rated A- with a term of five years.

Figure 1: Changes in the five year risk-free rate and debt premium over time[12]



11 The risk-free rate is estimated based on an interpolation of bid yields on New Zealand government stock to a term to maturity of five years. The debt premium is estimated on publicly traded corporate bonds according to the methodology specified in the input methodology determinations.

12 Figure 1 shows the risk-free rate and debt premium applying to the WACC estimates for AIAL/CIAL and Vector/GasNet in this determination. The risk-free rate and debt premium for Transpower and First Gas are excluded for simplicity, given that these estimates do not reflect the amendments made in the 2016 IM review. DPRY means 'debt premium reference year' and has the meaning specified in clause 1.1.4(2) of the GDS and Airports IM Determinations. The 'Average debt premium' line is a simple average of the five most recent estimates of the (prevailing) debt premium whereas previously, under the previous IMs Determinations, the prevailing debt premium was used.

Reasons for differences in WACC under input methodologies determinations

15. Differences in the WACCs estimated under the various cost of capital input methodologies reflect differences in the:

    15.1 date of estimation for the WACCs, which results in different estimates of the risk-free rate and debt premium;

    15.2 periods in which the WACCs will apply;

    15.3 context in which the WACCs will be used;

    15.4 different debt premium reference periods for the individual regulated services;

    15.5 assessed risk of the various regulated services (Transpower has an asset beta of 0.34, GPBs (First Gas) have an asset beta of 0.44, gas pipeline businesses (Vector GDB and GasNet GDB) have an asset beta of 0.4 and Airports have an asset beta of 0.60); and

    15.6 value of leverage for airports (19%),Vector's GDB and GasNet's GDB (42%), First Gas' GDB (44%)[13], First Gas' GTB (44%)[14], and Transpower (44%).[15]

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13 First Gas's GDB value of leverage will be 42% from 1 October 2017.

14 First Gas's GTB value of leverage will be 42% from 1 October 2017.

15 Transpower's value of leverage will be 42% from 1 July 2018.

WACC for Transpower disclosure year 2018

16. Under clauses 2.4.1 of the Transpower IM Determination, we have determined the following vanilla and post-tax WACCs for disclosure year 2018:

    16.1 A mid-point estimate of vanilla WACC of 5.29% for the five year period commencing on the first day of disclosure year 2018.[16]

    16.2 A mid-point estimate of post-tax WACC of 4.75% for the five year period commencing on the first day of disclosure year 2018.

    16.3 A vanilla WACC range from 4.57% to 6.00%, where the endpoints are the 25th and 75th percentile estimates respectively.

    16.4 A post-tax WACC range from 4.03% to 5.46%, where the endpoints are the 25th and 75th percentile estimates respectively.

    16.5 We have determined a 67th percentile estimate of vanilla WACC of 5.75%.[17]

    16.6 We have also determined a 67th percentile estimate of post-tax WACC of 5.21%.[18]

Parameters used to estimate the WACC for Transpower

17. The above estimates of vanilla and post-tax WACC reflect the parameters specified in the Transpower IM Determination.

18. The risk-free rate and debt premium are also estimated in accordance with the Transpower IM Determination.

Summary of parameters

19. The parameters used to estimate the vanilla and post-tax WACCs for Transpower disclosure year 2018 are summarised in Table 2 below.

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[16] The first day of the disclosure year is 1 July 2017.

[17] Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2.

[18] Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2.

Table 2: Parameters used to calculate WACC for Transpower disclosure year 2018

Parameter	5 year estimate
Risk-free rate	2.39%
Debt premium (BBB+)	1.65%
Leverage	44%
Asset beta	0.34
Equity beta	0.61
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.35%
Cost of debt	4.39%
Cost of equity	5.99%
Standard error of WACC	0.011
Mid-point vanilla WACC	5.29%
Mid-point post-tax WACC	4.75%

Note: The cost of debt is calculated as the risk-free rate + debt premium + debt issuance costs. The cost of equity is calculated as the risk-free rate × (1- investor tax rate) + the equity beta × the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity × (1 - leverage) + the cost of debt × leverage. The mid-point post-tax WACC is calculated as the cost of debt × (1 – corporate tax rate) × leverage + cost of equity × (1 - leverage).

Risk-free rate

20. The risk-free rate reflects the linearly interpolated, annualised, bid yield to maturity on New Zealand Government bonds with a term to maturity of five years. The estimates use data reported by Bloomberg for the month of June 2017 in respect of the 15 May 2021 and 15 April 2023 maturity bonds. The daily data reported by Bloomberg is linearly interpolated, annualised (to reflect the six monthly payment of

interest), and averaged to produce the estimate of a 2.39% interest rate on a New Zealand Government bond with a five year term to maturity as at 1 July 2017.[19]

Tax rates

21. The average corporate tax rate is the corporate tax rate of 28% for all years. The average investor tax rate is the investor tax rate of 28% for all years.

Standard error of the WACC

22. The standard error of the WACC is determined in accordance with the formula in the Transpower IM Determination, and is shown to three decimal places in the table above.

Debt premium

23. The methodology for determining the debt premium is set out in clause 2.4.4 of the Transpower IM determination.[20].

24. Clause 2.4.4(3)(d) requires the Commission to estimate the debt premium that would reasonably be expected to apply to a vanilla NZ$ denominated bond that:

    24.1 is issued by an EDB or a GPB that is neither majority owned by the Crown nor a local authority;

    24.2 is publicly traded;

    24.3 has a qualifying rating of grade BBB+; and

    24.4 has a remaining term to maturity of five years.[21]

25. In estimating the debt premium, clause 2.4.4(4) of the Transpower IM Determination provides that the Commission will have regard to:

    25.1 bonds issued by an EDB or a GPB (that is neither majority owned by the Crown nor a local authority) with a rating of BBB+;

    25.2 bonds issued by another entity (that is neither majority owned by the Crown nor a local authority) with a rating of BBB+;

    25.3 bonds issued by an EDB or a GPB (that is neither majority owned by the Crown nor a local authority) with a rating other than BBB+;

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[19] The risk free rate estimate of 2.39% for Transpower and First Gas differs from the estimate of 2.49% for AIAL, CIAL, Vector and GasNet. The estimate of 2.39% is based on the IMs prior to the 2016 amendments, and uses data for the month of June 2016. The estimate of 2.49% is based on the revised IMs (including the 2016 amendments), and uses three months' worth of data.

[20] Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4 of Appendix Part 2.

[21] Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(3)(d) of Appendix Part 2.

25.4 bonds issued by another entity (that is neither majority owned by the Crown nor a local authority) with a rating other than BBB+; and

25.5 bonds that are investment grade credit rated and issued by an entity that is majority owned by the Crown or a local authority.[22]

26. Clause 2.4.4(5)(a) provides that progressively less consideration will ordinarily be given to the debt premium estimates in the order that the bonds are identified in clauses 2.4.4(4)(a) to (e).[23]

27. Table 3 below shows the debt premium we have determined as at 1 July 2017. This table includes a summary of information on the investment grade rated bonds we considered in determining the debt premium.

28. A spreadsheet showing the calculations for the debt premium (and the risk-free rate) is published on our website.[24]

Table 3: Debt premium values for the previous 5 years for Transpower and GPBs (First Gas), BBB+ (%)

	Industry	Rating	Remaining term to maturity	Debt premium
Determined debt premium	EDB/GPB	BBB+	5.0	1.65

Subclause	Issuer	Note ref.	Industry	Rating	Remaining term to maturity	Debt premium	Comment
4(a)	-		-	-	-	-	No data on applicable bonds
4(b)	Wellington Intl Airpor	1	Other	BBB+	3.0	1.58	5 year debt premium would be higher
4(c)	-		-	-	-	-	No data on applicable bonds
4(d)	Auckland Intl Airport	2	Other	A-	5.0	1.23	BBB+ debt premium would he higher
	Fonterra Cooperative G	3	Other	A-	5.0	1.44	BBB+ debt premium would he higher
	Spark Finance Ltd	4	Other	A-	5.0	1.44	BBB+ debt premium would he higher
	Chorus Ltd	5	Other	BBB	3.9	1.68	5 year debt premium would be higher; BBB+ debt premium would be lower
	Contact Energy Ltd	6	Other	BBB	4.4	1.50	5 year debt premium would be higher; BBB+ debt premium would be lower
4(e)	Christchurch Intl Airp	7	Other	BBB+	4.3	1.58	
	Genesis Energy Ltd	8	Other	BBB+	5.0	1.62	
	Mercury Nz Ltd	9	Other	BBB+	5.0	1.67	
	Meridian Energy Limite	10	Other	BBB+	5.7	1.60	
	Transpower New Zealand	11	Other	AA-	5.0	1.13	

Notes on bonds analysed:

1 5.27% bond maturing on 11/06/2020
2 5.52% bond maturing on 28/05/2021; 4.28% bond maturing on 9/11/2022
3 5.9% bond maturing on 25/02/2022; 4.42% bond maturing on 7/03/2023
4 4.5% bond maturing on 25/03/2022; 4.51% bond maturing on 10/03/2023
5 4.12% bond maturing on 6/05/2021
6 4.4% bond maturing on 15/11/2021
7 6.25% bond maturing on 4/10/2021
8 4.14% bond maturing on 18/03/2022; 5.81% bond maturing on 8/03/2023
9 8.21% bond maturing on 11/02/2020; 5.793% bond maturing on 6/03/2023
10 4.53% bond maturing on 14/03/2023
11 6.95% bond maturing on 10/06/2020; 4.3% bond maturing on 30/06/2022

22 Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(4) of Appendix Part 2.

23 Transpower IM Determination as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(5)(a) of Appendix Part 2

24 See www.comcom.govt.nz/cost-of-capital.

29. We consider 1.58% to be an appropriate starting point for estimating the debt premium, given that the WIAL bond is the closest match with the requirements of clause 2.4.4(3)(d). As at 1 July 2017, the debt premium on the WIAL bond was estimated at 1.58% with a remaining term to maturity of three years. This bond is issued by an entity other than an EDB/GPB but is publicly traded and has a rating of BBB+.

30. Given the WIAL bond has a shorter term to maturity than 5 years, our debt premium estimate should be above 1.58%.[25]

31. We have also considered the estimated debt premium on bonds from a range of other issuers. The bonds outlined under 4(d) in Table 3 above have issuers that are not majority government owned, but have a rating other than BBB+ and are not EDBs or GPBs.[26] The bonds from these issuers are consistent with a debt premium slightly above 1.58%, however they were given less consideration due to their sector and credit rating not being BBB+.[27]

32. The bonds listed under 4(e) of Table 3 above are issued by majority government owned entities. The debt premiums on these bonds were given less weight (as the issuers are majority government owned), but generally suggest our debt premium estimate should be approximately 1.60% to 1.70%.

33. We have determined the debt premium on a publicly traded EDB/GPB-issued bond, rated BBB+ with a remaining term of five years, to be 1.65% as at 1 July 2017. This estimate was reached by placing primary weight on the debt premium for the WIAL bond (which has a remaining term to maturity shorter than the 5 year benchmark), but also considering the debt premium on a range of other bonds (as described above).

[25] Consistent with clauses 2.4.4(4) and 2.4.4(5)(a) of Appendix Part 2 of the Transpower IM Determination.
[26] In this determination government owned means owned by the Crown or a local authority as defined in the Transpower IM Determination.
[27] As specified in clause 2.4.4(3)(d) of Appendix Part 2 in the Transpower IM Determination.

WACC for GPB (First Gas) information disclosure year 2017

35. Under clause 2.4.1 of both the GDS and GTS IM Determinations, we have determined the following vanilla and post-tax WACCs for information between 1 July 2017 and 30 September 2017 (the final 3 months of disclosure year 2017).[28]

   35.1 A mid-point estimate of vanilla WACC of 5.99% for the five year period as at 1 July 2017

   35.2 Under clause 2.4.7, we have also determined a vanilla WACC range from 5.18% to 6.80%, where the endpoints are the 25th and 75th percentile estimates respectively.[29]

   35.3 A mid-point estimate of post-tax WACC of 5.45% for the five year period as at 1 July 2017 (the final 3 months of disclosure year 2017).

   35.4 Under clause 2.4.7, we have also determined a post-tax WACC range from 4.64% to 6.26%, where the endpoints are the 25th and 75th percentile estimates respectively.[30]

   35.5 We have determined a 67th percentile estimate of vanilla WACC of 6.52%.

   35.6 We have also determined a 67th percentile estimate of post-tax WACC of 5.98%.

Parameters used to estimate the WACC for GPBs

36. The above estimates of vanilla and post-tax WACC reflect the parameters specified in the GDS and GTS IM Determinations. The risk-free rate and debt premium are also estimated in accordance with the GDS and GTS IM Determinations.

Summary of parameters

37. The parameters used to estimate the vanilla and post-tax WACCs for information disclosure year 2017 for GPBs with a June year-end are summarised in Table 4 below.

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28 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.1 of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.1 of Appendix Part 2.

29 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2.

30 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.7 of Appendix Part 2.

Table 4: Parameters used to calculate WACC for GPB (First Gas) 2017 disclosure year

Parameter	5 year estimate
Risk-free rate	2.39%
Debt premium (BBB+)	1.65%
Leverage	44%
Asset beta	0.44
Equity beta	0.79
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.35%
Cost of debt	4.39%
Cost of equity	7.25%
Standard error of WACC	0.012
Mid-point vanilla WACC	5.99%
Mid-point post-tax WACC	5.45%

Note: The cost of debt is calculated as the risk-free rate + debt premium + debt issuance costs. The cost of equity is calculated as the risk-free rate × (1- investor tax rate) + the equity beta × the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity × (1 - leverage) + the cost of debt × leverage. The mid-point post-tax WACC is calculated as the cost of debt × (1 – corporate tax rate) × leverage + cost of equity × (1 - leverage).

Risk-free rate

38. The risk-free rate reflects the linearly interpolated, annualised, bid yield to maturity on New Zealand Government bonds with a term to maturity of five years. The estimates use data reported by Bloomberg for the month of June 2017 in respect of the 15 May 2021 and 15 April 2023 maturity bonds.

39. The daily data reported by Bloomberg is linearly interpolated, annualised (to reflect the six monthly payment of interest), and averaged to produce the estimate of a 2.39% interest rate on a New Zealand Government bond with a five year term to maturity as at 1 July 2017.[31]

Tax rates

40. The average corporate tax rate is the corporate tax rate of 28% for all years. The average investor tax rate is the investor tax rate of 28% for all years.

Standard error of the WACC

41. The standard error of the WACC is determined in accordance with the formula in the GDS and GTS IM Determinations, and is shown to three decimal places only in the table above.

Debt premium

42. The methodology for determining the debt premium is set out in clause 2.4.4 of the GDS and GTS IM Determinations.[32]

43. Clause 2.4.4(3)(d) requires the Commission to estimate the debt premium that would reasonably be expected to apply to a vanilla NZ$ denominated bond that:

    43.1 is issued by a GPB or an EDB that is neither majority owned by the Crown nor a local authority;

    43.2 is publicly traded;

    43.3 has a qualifying rating of grade BBB+; and

    43.4 has a remaining term to maturity of five years.[33]

44. In estimating the debt premium, clause 2.4.4(4) of the GDS and GTS IM Determinations provides that the Commission will consider:

    44.1 bonds issued by a GPB or an EDB (that is neither majority owned by the Crown nor a local authority) with a rating of BBB+;

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[31] The risk free rate estimate of 2.39% for Transpower and First Gas differs from the estimate of 2.49% for AIAL, CIAL, Vector and GasNet. The estimate of 2.39% is based on the IMs prior to the 2016 amendments, and uses data for the month of June 2016. The estimate of 2.49% is based on the revised IMs (including the 2016 amendments), and uses three months' worth of data.

[32] *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4 of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4 of Appendix Part 2.

[33] *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(3)(d) of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(3)(d) of Appendix Part 2.

44.2 bonds issued by another entity (that is neither majority owned by the Crown nor a local authority) with a rating of BBB+;

44.3 bonds issued by a GPB or an EDB (that is neither majority owned by the Crown nor a local authority) with a rating other than BBB+;

44.4 bonds issued by another entity (that is neither majority owned by the Crown nor a local authority) with a rating other than BBB+; and

44.5 bonds that are investment grade credit rated and issued by an entity that is majority owned by the Crown or a local authority.[34]

45. Clause 2.4.4(5)(a) provides that progressively less consideration will ordinarily be given to the debt premium estimates in the order that the bonds are identified in clauses 2.4.4(4)(a) to (e).[35]

46. Table 3 above shows the debt premium we have determined as at 1 July 2017. This table includes a summary of information on the investment grade rated bonds we considered in determining the debt premium.

47. A spreadsheet showing the calculations for the debt premium (and the risk-free rate) is published on our website.[36]

WACC for other gas distribution businesses disclosure year 2018

48. Under clause 2.4.1 of the GDS IM Determination[37], we have determined the following vanilla and post-tax WACCs for disclosure year 2018.

48.1 A mid-point estimate of vanilla WACC of 5.73% for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017).

48.2 Under clause 2.4.5, we have also determined a vanilla WACC range from 5.02% to 6.44%, where the endpoints are the 25th and 75th percentile estimates respectively.

48.3 A mid-point estimate of post-tax WACC of 5.20% for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017).

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34 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(4) of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(4) of Appendix Part 2.

35 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(5)(a) of Appendix Part 2. For First Gas' GTB, see *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 27, as subsequently amended and included in the latest consolidated determination (28 February 2017), clause 2.4.4(5)(a) of Appendix Part 2.

36 See www.comcom.govt.nz/cost-of-capital.

37 Gas Distribution Services Input methodologies Determination 2012 – consolidated as of 28 February 2017.

48.4 Under clause 2.4.5, we have also determined a post-tax WACC range from 4.49% to 5.91%, where the endpoints are the 25th and 75th percentile estimates respectively.

Parameters used to estimate the WACC for GDBs

49. The above estimates of vanilla and post-tax WACC reflect the parameters specified in the GDS IM Determination. The risk-free rate is also estimated in accordance with the GDS IM Determination.

Summary of parameters

50. The parameters used to estimate the vanilla and post-tax WACCs for disclosure year 2018 for GDBs are summarised in 5 below.

Table 5: Parameters used to calculate WACC for GPB disclosure year 2018

Parameter	5 year estimate
Risk-free rate	2.49%
Average debt premium	1.81%
Leverage	42%
Asset beta	0.40
Equity beta	0.69
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.20%
Cost of debt	4.49%
Cost of equity	6.62%
Standard error of WACC	0.0105
Mid-point vanilla WACC	5.73%
Mid-point post-tax WACC	5.20%

Note: The cost of debt is calculated as the risk-free rate + debt premium + debt issuance costs. The cost of equity is calculated as the risk-free rate × (1- investor tax rate) + the equity beta × the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity × (1 - leverage) + the cost of debt × leverage. The mid-point post-tax WACC is calculated as the cost of debt × (1 – corporate tax rate) × leverage + cost of equity × (1 - leverage).

Risk-free rate

51. The risk-free rate reflects the linearly interpolated, annualised, bid yield to maturity on New Zealand Government bonds with a term to maturity of five years. The estimates use data reported by Bloomberg for the three month period ending June 2017 in respect of the 15 May 2021 and 15 April 2023 maturity bonds.[38]

52. The daily data reported by Bloomberg is linearly interpolated, annualised (to reflect the six monthly payment of interest), and averaged to produce the estimate of a 2.49% interest rate on a New Zealand Government bond with a five year term to maturity as at 1 July 2017.

Tax rates

53. The average corporate tax rate is the corporate tax rate of 28% for all years. The average investor tax rate is the investor tax rate of 28% for all years.

Standard error of the WACC

54. The standard error of the WACC is provided in the GDS IM Determination, and is shown to four decimal places in the table above.

Average debt premium

55. The average debt premium is the average of the estimated debt premium for the most recent 5 years. The debt premium values for the 2014 to 2017 debt premium reference years are set out in clause 2.4.4(4) of the GDS IM Determination and can be seen in table 5 below.

56. The debt premium value for 2018 was determined as part of the WACC calculations for DPP for GPBs in March 2017.[39]

[38] The risk free rate estimate of 2.39% for Transpower and First Gas differs from the estimate of 2.49% for AIAL, CIAL, Vector and GasNet. The estimate of 2.39% is based on the IMs prior to the 2016 amendments, and uses data for the month of June 2016. The estimate of 2.49% is based on the revised IMs (including the 2016 amendments), and uses three months' worth of data.

[39] See www.comcom.govt.nz/cost-of-capital.

Table 6: Debt premium values for the previous 5 years for other gas distribution businesses, BBB+ (%)

	DPRY 2014	DPRY 2015	DPRY 2016	DPRY 2017	DPRY 2018	Average
Debt premium	2.34	1.84	1.66	1.54	1.65	1.81

WACC for AIAL and CIAL disclosure year 2018

58. Under clause 5.1 of the Airports IM Determination, we have determined the following vanilla and post-tax WACCs for disclosure year 2018.

    58.1 A mid-point estimate of vanilla WACC of 6.41% for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017).

    58.2 A mid-point estimate of post-tax WACC of 6.19% for the five year period commencing on the first day of disclosure year 2018 (ie, 1 July 2017).

Parameters used to estimate the WACC for AIAL and CIAL

59. The above estimates of vanilla and post-tax WACC reflect the parameters specified in the Airports IM Determination. The risk-free rate and debt premium are also estimated in accordance with the Airports IM Determination.

Summary of parameters

60. The parameters used to estimate the vanilla and post-tax WACCs for AIAL and CIAL disclosure year 2018 are summarised in Table 7 below.

Table 7: Parameters used to calculate WACC for AIAL and CIAL 2018 disclosure year

Parameter	5 year estimate
Risk-free rate	2.49%
Average debt premium	1.31%
Leverage	19%
Asset beta	0.60
Equity beta	0.74
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.20%
Cost of debt	4.00%
Cost of equity	6.97%
Standard error of WACC	0.0146
Mid-point vanilla WACC	6.41%
Mid-point post-tax WACC	6.19%

Note: The cost of debt is calculated as the risk-free rate + debt premium + debt issuance costs. The cost of equity is calculated as the risk-free rate × (1- investor tax rate) + the equity beta × the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity × (1 - leverage) + the cost of debt × leverage. The mid-point post-tax WACC is calculated as the cost of debt × (1 – corporate tax rate) × leverage + cost of equity × (1 - leverage).

Risk-free rate

61. The risk-free rate reflects the linearly interpolated, annualised, bid yield to maturity on New Zealand Government bonds with a term to maturity of five years. The estimates use data reported by Bloomberg for the three month period ending June 2017 in respect of the 15 May 2021 and 15 April 2023 maturity bonds.

62. The daily data reported by Bloomberg is linearly Interpolated, annualised (to reflect the six monthly payment of interest), and averaged to produce the estimate of a 2.49% interest rate on a New Zealand Government bond with a five year term to maturity as at 1 July 2017.

Tax rates

63. The average corporate tax rate is the corporate tax rate of 28% for all years. The average investor tax rate is the investor tax rate of 28% for all years.

Standard error of the WACC

64. The standard error of the WACC is in the Airports IM Determination, and is shown to four decimal places in the table above.

Average debt premium

65. The methodology for determining the debt premium is set out in clause 5.4 of the Airports IM Determination.

66. Clause 5.4(6)(d) requires the Commission to estimate the debt premium that would reasonably be expected to apply to a vanilla NZ$ denominated bond that:

    66.1 is issued by an airport that is neither 100% owned by the Crown nor a local authority;

    66.2 is publicly traded;

    66.3 has a qualifying rating of grade A-; and

    66.4 has a remaining term to maturity of five years.

67. In estimating the debt premium, clause 5.4(7) of the Airports IM Determination provides that the Commission will consider:

    67.1 bonds issued by an airport (that is neither 100% owned by the Crown nor a local authority) with a qualifying rating of A-;

    67.2 bonds issued by another entity (that is neither 100% owned by the Crown nor a local authority) with a qualifying rating of A-;

    67.3 bonds issued by an airport (that is neither 100% owned by the Crown nor a local authority) with a qualifying rating other than A-;

    67.4 bonds issued by another entity (that is neither 100% owned by the Crown nor a local authority) with a qualifying rating other than A-; and

    67.5 bonds that are investment grade credit rated and issued by an entity that is 100% owned by the Crown or a local authority.

68. Clause 5.4(5)(a) provides that progressively less consideration will ordinarily be given to the debt premium estimates in the order that the bonds are identified in clauses 5.4(4)(a) to (e).

69. Table below shows the debt premium we determined as at 1 July 2017. This table includes a summary of information on the investment grade rated bonds we considered in determining the debt premium.

70. A spreadsheet showing the calculations for the debt premium (and the risk-free rate) is published on our website.[40]

Table 8: Five year debt premium on an Airport-issued bond rated A-[41]

	Industry	Rating	Remaining term to maturity	Debt premium
Determined debt premium	Airport	A-	5.0	1.35

Category	Issuer	Note ref.	Industry	Rating	Remaining term to maturity	Debt premium	Comment
(a)	Auckland Intl Airport	1	Airport	A-	5.0	1.28	Credit rating and term are an exact match
(b)	Fonterra Cooperative G	2	Other	A-	5.0	1.61	Credit rating and term are an exact match
	Spark Finance Ltd	3	Other	A-	5.0	1.45	Credit rating and term are an exact match
(c)	Wellington Intl Airpor	4	Airport	BBB+	3.4	1.58	5 year debt premium would be higher; A- debt premium would be lower
(d)	Chorus Ltd	5	Other	BBB	4.3	1.73	5 year debt premium would be higher; A- debt premium would be lower
	Contact Energy Ltd	6	-	BBB	4.9	1.65	5 year debt premium would be higher; A- debt premium would be lower
	Genesis Energy Ltd	7	Other	BBB+	5.0	1.61	A- debt premium would be lower
	Mercury Nz Ltd	8	Other	BBB+	5.0	1.68	A- debt premium would be lower
	Meridian Energy Limite	9	Other	BBB+	6.2	1.65	5 year debt premium would be lower; A- debt premium would be lower
(e)	Christchurch Intl Airp	10	Airport	BBB+	4.8	1.66	5 year debt premium would be higher; A- debt premium would be lower
	Transpower New Zealand	11	Other	AA-	5.0	1.16	A- debt premium would be higher
Nelson-Siegel-Svensson estimate					5.0	1.47	

Notes on bonds analysed:

1 5.52% bond maturing on 28/05/2021; 4.28% bond maturing on 9/11/2022
2 5.5% bond maturing on 25/02/2020; 4.3% bond maturing on 20/10/2021; 5.9% bond maturing on 25/02/2022; 4.42% bond maturing on 7/03/2023
3 5.3% bond maturing on 25/10/2019; 4.5% bond maturing on 25/03/2022; 4.51% bond maturing on 10/03/2023
4 5.27% bond maturing on 11/06/2020
5 4.12% bond maturing on 6/05/2021
6 4.4% bond maturing on 15/11/2021
7 8.3% bond maturing on 23/06/2020; 4.14% bond maturing on 18/03/2022; 5.81% bond maturing on 8/03/2023
8 8.21% bond maturing on 11/02/2020; 5.793% bond maturing on 6/03/2023
9 4.53% bond maturing on 14/03/2023
10 6.25% bond maturing on 4/10/2021
11 6.95% bond maturing on 10/06/2020; 4.3% bond maturing on 30/06/2022

71. We have had greatest regard to the estimated debt premium on the AIAL bonds, given these match the requirements in clause 5.4(6)(d).[42] These bonds are issued by an airport, are publicly traded, are rated A- and have a debt premium of 1.28% when linearly-interpolated to give a remaining term to maturity of five years.

72. However, both the Fonterra (1.61%) and Spark (1.45%) bonds support a debt premium greater than 1.28%. These bonds are also rated A- (consistent with our

[40] See www.comcom.govt.nz/cost-of-capital.
[41] The five-year debt premiums on the AIAL, Spark, Fonterra, Genesis Energy, Mercury and Transpower bonds are calculated by linear interpolation with respect to maturity.
[42] Consistent with clauses 5.4(4) and 5.4(5)(a) of the Airports IM Determination.

benchmark), and the interpolated 5 year debt premiums are significantly higher than for AIAL.[43] Starting with the debt premium on the AIAL bonds, but also taking into account the Fonterra and Spark bonds, suggests that a debt premium of approximately 1.35% is appropriate.

73. We have also considered the estimated debt premiums on bonds from a range of other issuers.[44] The estimated debt premiums from these other bonds are generally consistent with a debt premium of 1.35%, when consideration is given to different credit ratings and terms to maturity.

74. Accordingly, we have determined the debt premium on airport-issued bonds rated A-, with a remaining term to maturity of five years, to be 1.35% as at 1 July 2017. This is the DPRY 2018 estimate which can be seen in table 9 below.

75. The average debt premium is the average of the estimated debt premium for the most recent 5 years. The debt premium values for the 2014 to 2017 debt premium reference years are set out in clause 5.4(4) of the Airport Services IM Determination and can be seen in table 8 below.

Table 9: Debt premium values for the previous 5 years for Airports, A- (%)

	DPRY 2014	**DPRY 2015**	**DPRY 2016**	**DPRY 2017**	**DPRY 2018**	**Average**
Debt premium	1.50	1.25	1.05	1.38	1.35	1.31

43 Consistent with the ordering of the bonds in clause 5.4(4) of the Airports IM Determination, we have had lesser regard to the Fonterra and Spark bonds than the AIAL bonds.

44 We have considered the estimated debt premium on bonds from issuers listed in categories c, d and e in table 8.