

# **Cost of capital determination for information disclosure year 2018 for electricity distribution services and specified airport services (March year-end disclosure year)**

**[2017] NZCC 7**

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### Associated documents

Publication date	Reference	Title
29 April 2016	ISSN 1178-2560	Cost of capital determination for information disclosure year 2017 for electricity distribution services and specified airport services (March year-end) [2016] NZCC 9
20 December 2016	ISSN 1178-2560	Airport Services Input Methodologies Determination 2010 (Consolidated December 2016)
20 December 2016	ISBN 978-1-869455-48-4	Input methodologies review decisions (Topic paper 4: Cost of capital issues)
28 February 2017	ISSN 1178-2560	Electricity Distribution Services Input Methodologies Determination 2012 (Consolidated February 2017)

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## Executive summary

1. This determination specifies weighted average cost of capital (WACC) estimates that will apply for the information disclosure year 2018 (that is, the 12 months commencing 1 April 2017) for:
  - 1.1 electricity distribution businesses (EDBs); and
  - 1.2 providers of specified airport services with a financial year ending in March (Wellington International Airport Limited (WIAL)).
2. Vanilla and post-tax WACC estimates for EDBs, for the five year period commencing on the first day of disclosure year 2018 are summarised in Table 1 below.<sup>1</sup>

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

	Mid-point	25 <sup>th</sup> percentile	67 <sup>th</sup> percentile	75 <sup>th</sup> percentile
Vanilla WACC	5.60	4.92	6.05	6.29
Post-tax WACC	5.04	4.36	5.48	5.72

3. Vanilla and post-tax WACC estimates for WIAL, for the five year period commencing on the first day of disclosure year 2018 are summarised in Table 2 below.

**Table 2: Summary of vanilla and post-tax WACC estimates for WIAL (%)**

	Mid-point	Std error
Vanilla WACC	6.64	0.0146
Post-tax WACC	6.41	0.0146

4. The WACCs in Table 1 and 2 above are estimated as at 1 April 2017.

<sup>1</sup> 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.

## Introduction

5. This determination specifies WACC estimates that will apply to EDBs and providers of specified airport services with a financial year ending in March (WIAL) for information disclosure year 2018 (that is, the 12 months to 31 March 2018).
6. The WACC estimates are set pursuant to:
  - 6.1 clauses 2.4.1 to 2.4.9 of the Electricity Distribution Services Input Methodologies Determination 2012 (Consolidated February 2017); and
  - 6.2 clauses 5.1 to 5.7 of the Airport Services Input Methodologies Determination 2010 (Consolidated December 2016).
7. We have estimated both vanilla and post-tax WACCs.
8. The parameter values, estimates and information sources used for each WACC estimate are set out in this determination. Additional commentary on the estimation of the risk-free rate is also provided.
9. A spreadsheet showing the calculations for the WACC estimates and risk free rate has been published on our website.<sup>2</sup> This spreadsheet includes the historical debt premium values for 2013 through to 2017 which are used for calculating the average debt premium.

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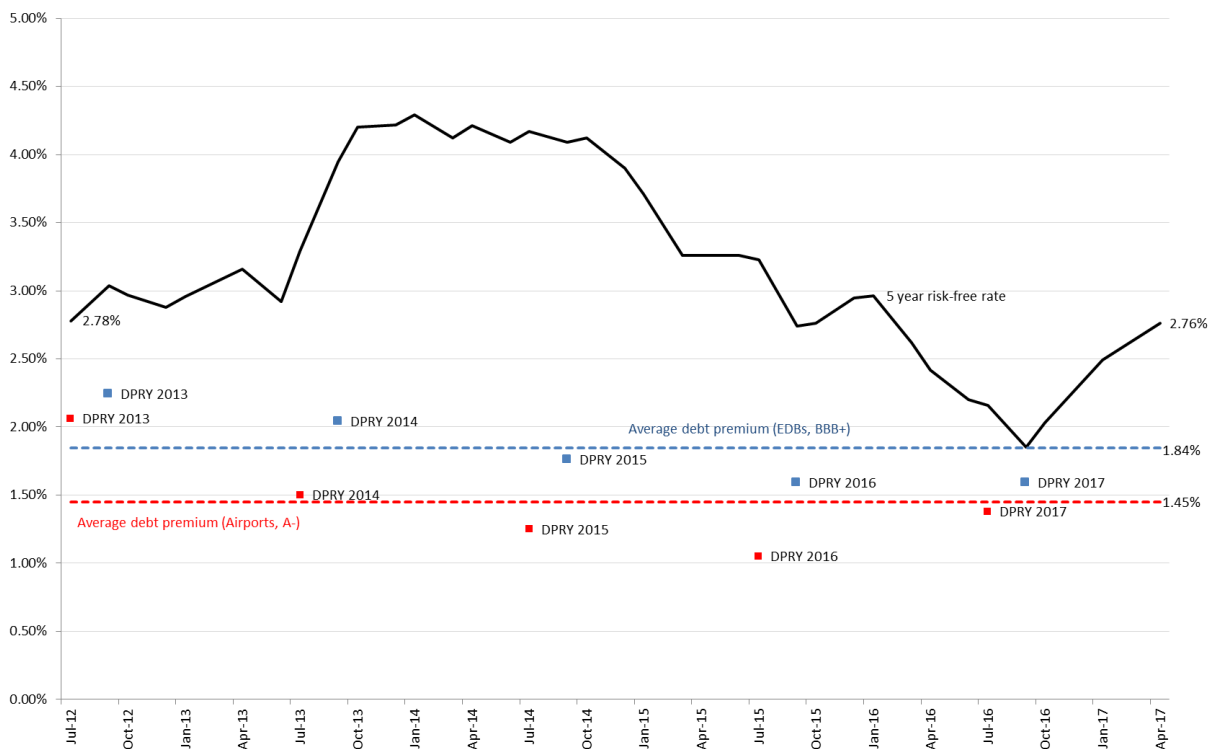
<sup>2</sup> See [www.comcom.govt.nz/cost-of-capital](http://www.comcom.govt.nz/cost-of-capital). This spreadsheet includes calculations for the WACC estimates and risk-free rate.

## Background

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

10. The cost of capital input methodologies for regulated services reflect that both the risk-free rate and the debt premium on bonds change over time.<sup>3</sup>
11. Changes in the risk-free rate and debt premium on bonds are illustrated below. Figure 1 shows, as at 1 April 2017, changes over time in the:
  - 11.1 five year risk-free rate;
  - 11.2 debt premium on bonds rated BBB+ for EDBs with a term of five years;
  - 11.3 debt premium on bonds rated A- for WIAL with a term of five years.

**Figure 1: Changes in the risk-free rate and debt premium over time<sup>4</sup>**



<sup>3</sup> 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 methodologies determinations.

<sup>4</sup> DPRY means 'debt premium reference year' and has the meaning specified in clause 1.1.4(2) of the EDS 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 EDS IM Determination, the prevailing debt premium was used. For more information on our new debt premium methodology, see Attachment G of the Input Methodologies review decisions (Topic paper 4: Cost of capital issues), 20 December 2016.

## Reasons for differences in WACC under the various cost of capital input methodologies' determinations

12. Differences in the WACCs estimated under the various cost of capital input methodologies reflect differences in the:
  - 12.1 date of estimation for the WACCs, which results in different estimates of the risk-free rate and debt premium;
  - 12.2 periods in which the WACCs will apply;
  - 12.3 context in which the WACCs will be used;<sup>5</sup>
  - 12.4 assessed risk of the various regulated services (EDBs and Transpower have an asset beta of 0.35, gas pipeline businesses (GPBs) have an asset beta of 0.40, and airports have an asset beta of 0.60); and
  - 12.5 value of leverage for airports (19%) and for EDBs, GPBs, and Transpower (42%).
  
13. The new historical averaging approach requires us to estimate, for each year, a debt premium for a five-year debt term. We then use the average of the five most recent individual yearly estimates to determine an average debt premium.
  - 13.1 The yearly estimates used in the averaging process correspond to a debt premium reference year (DPRY) that is specific for each sector. The DPRY periods are:<sup>6</sup>
    - EDBs – September to August;
    - Transpower – September to August;
    - GPBs – March to February; and
    - Airports – July to June.
  - 13.2 The five-year period used to determine the average debt premium for EDBs and airports in this determination is 2013-2017 because the 2018 debt premium estimate will not be determined until September 2017 (for EDBs) and July 2017 (for airports).
  - 13.3 The debt premium estimates for the years 2013-2017 are published in the IMs and so a new debt premium estimate for EDBs or Airports is not required in this determination.<sup>7</sup>

<sup>5</sup> 67th percentile WACC estimates are used for the purposes of price-quality paths, while a mid-point and range is determined for information disclosure.

<sup>6</sup> See attachment G of the Input methodologies review decisions (Topic paper 4: Cost of capital issues).

<sup>7</sup> See clause 2.4.4(4) of the EDB IM determination and clause 5.4(4) of the Airports IM determination.

## WACC for EDB information disclosure year 2018

14. Under clause 2.4.1 of the EDS IM Determination, we have determined (as at 1 April 2017) the following vanilla and post-tax WACCs for EDB information year 2018 outlined in Table 3.

**Table 3: Determined vanilla and post-tax WACC estimates for EDBs 2018 ID (%)**

	Mid-point	25 <sup>th</sup> percentile	67 <sup>th</sup> percentile	75 <sup>th</sup> percentile
Vanilla WACC	5.60	4.92	6.05	6.29
Post-tax WACC	5.04	4.36	5.48	5.72

### Parameters used to estimate the WACC for EDBs

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

*Summary of parameters*

16. The parameters used to estimate the vanilla and post-tax WACCs for EDB information disclosure year 2018 are summarised in Table 4 below.

**Table 4: Parameters used to calculate vanilla and post-tax WACC for EDBs**

<b>Parameter</b>	<b>5 year estimate</b>
<b>Risk-free rate</b>	2.76%
<b>Average debt premium (BBB+)</b>	1.84%
<b>Leverage</b>	42%
<b>Asset beta</b>	0.35
<b>Equity beta</b>	0.60
<b>Tax adjusted market risk premium</b>	7.0%
<b>Average corporate tax rate</b>	28%
<b>Average investor tax rate</b>	28%
<b>Debt issuance costs</b>	0.20%
<b>Cost of debt</b>	4.80%
<b>Cost of equity</b>	6.19%
<b>Standard error of WACC</b>	0.0101
<b>Mid-point vanilla WACC</b>	5.60%
<b>Mid-point post-tax WACC</b>	5.04%

**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.



*Risk-free rate*

17. 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 March 2017 in respect of the May 2021 and April 2023 maturity bonds. The May 2021 and April 2023 bonds have simple average annualised bid yields to maturity of 2.63% and 2.91% respectively.
18. The daily data reported by Bloomberg is annualised (to reflect the six monthly payment of interest), averaged and linearly-interpolated to produce the estimate of a 2.76% interest rate on New Zealand government bonds with a five year term maturity as at 1 April 2017.

*Tax rates*

19. 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*

20. The standard error of the WACC is provided in the EDS IM Determination, and is shown to four decimal places in Table 4 above.

*Debt premium*

21. The average debt premium is the average of the estimated debt premium for the most recent 5 years. The debt premium values for the 2013 to 2017 debt premium reference years are set out in clause 2.4.4(4) of the EDS IM Determination and can be seen in table 5 below.

**Table 5: Debt premium values for the previous 5 years for EDBs, BBB+ (%)**

	<b>DPRY</b>	<b>DPRY</b>	<b>DPRY</b>	<b>DPRY</b>	<b>DPRY</b>	
	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Average</b>
Debt premium	2.24	2.04	1.76	1.59	1.59	1.84

## WACC for WIAL information disclosure year 2018

22. Under clause 5.1 of the Airports IM Determination, we have determined (as at 1 April 2017) the following vanilla and post-tax WACCs for WIAL information year 2018 outlined in Table 6.

**Table 6: Summary of vanilla and post-tax WACC estimates for WIAL (%)**

	Mid-point	Std error
Vanilla WACC	6.64	0.0146
Post-tax WACC	6.41	0.0146

## Parameters used to estimate the WACC for WIAL

### *Summary of parameters*

23. The parameters used to estimate the vanilla and post-tax WACCs for WIAL information disclosure year 2018 are summarised in Table 7 below.

**Table 7: Parameters used to calculate vanilla and post-tax WACC for WIAL**

<b>Parameter</b>	<b>5 year estimate</b>
<b>Risk-free rate</b>	2.76%
<b>Average debt premium (A-)</b>	1.45%
<b>Leverage</b>	19%
<b>Asset beta</b>	0.60
<b>Equity beta</b>	0.74
<b>Tax adjusted market risk premium</b>	7.0%
<b>Average corporate tax rate</b>	28%
<b>Average investor tax rate</b>	28%
<b>Debt issuance costs</b>	0.20%
<b>Cost of debt</b>	4.41%
<b>Cost of equity</b>	7.17%
<b>Standard error of WACC</b>	0.0146
<b>Mid-point vanilla WACC</b>	6.64%
<b>Mid-point post-tax WACC</b>	6.41%

**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  $\times$  (1 - investor tax rate) + the equity beta  $\times$  the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity  $\times$  (1 - leverage) + the cost of debt  $\times$  leverage.

*Risk-free rate*

24. 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 March 2017 in respect of the May 2021 and April 2023 maturity bonds. The May 2021 and April 2023 bonds have simple average annualised bid yields to maturity of 2.63% and 2.91% respectively.
25. The daily data reported by Bloomberg is annualised (to reflect the six monthly payment of interest), averaged and linearly-interpolated to produce the estimate of a 2.76% interest rate on New Zealand government bonds with a five year term maturity as at 1 April 2017.

*Tax rates*

26. 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*

27. The standard error of the WACC is provided in the Airports IM Determination, and is shown to four decimal places in Table 7 above.

*Debt premium*

28. The average debt premium is the average of the estimated debt premium for the most recent 5 years. The methodology for estimating 'debt premium' is set out in clause 5.4 of the Airports IM Determination and can be seen in Table 8 below.

**Table 8: Debt premium values for the previous 5 years for Airports, A- (%)**

	<b>DPRY 2013</b>	<b>DPRY 2014</b>	<b>DPRY 2015</b>	<b>DPRY 2016</b>	<b>DPRY 2017</b>	<b>Average</b>
Debt premium	2.06	1.50	1.25	1.05	1.38	1.45