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Decision – WACC attachment

Appendix to the method decision on electricity and drinking water in the Caribbean Netherlands 2020-2025

Our reference : ACM/UIT/519576
Case number : ACM/18/034526

Calculating the WACC for energy and water companies in the Caribbean Netherlands for the year 2020 – 2022

As part of the determination by the Netherlands Authority for Consumers and Markets of a method as referred to in Section 2.5, paragraph 4, and Section 3.14, paragraph 5, of the BES Electricity and Drinking Water Act (*Wet elektriciteit en drinkwater BES*).

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Muzenstraat 41
2511 WB Den Haag
www.acm.nl
070 722 20 00

Table of contents

1 Summary

1. Since July 1, 2016, the Netherlands Authority for Consumers and Markets (hereafter: ACM) has been charged with the task to regulate the energy and drinking water companies on the Caribbean islands of Bonaire, St. Eustatius and Saba (the Caribbean Netherlands). One of the elements of the tariff regulation is calculating the reasonable return that companies are allowed to earn on their invested capital. ACM determines this reasonable return using the Weighted Average Cost of Capital (WACC).

2. In this report, ACM determines the WACC for the regulated electricity and drinking water companies in the Caribbean Netherlands. The purpose of and principles behind the WACC are explained in chapter 2. The method of the determination and calculation of the WACC is set out in chapter 3.

3. The regulated companies in the Caribbean Netherlands differ from each other in terms of activities. An overview of the companies and their activities are given in table 1.

Table 1: Overview of regulated companies

Company	Island	Electricity production	Electricity distribution	Water production	Water distribution
WEB	Bonaire	?[1]	V	V	V
CG	Bonaire	V	X	X	X
STUCO	St. Eustasius	V	V	V	V
SEC	Saba	V	V	X	X

4. As the risk level of each of these activities differs, so does the reasonable return for each company. This is reflected in the WACC. Therefore, four different WACCs are calculated. An overview is given in table 2, indicating which WACC is suitable for each company. Companies that carry out all activities are assigned a combined WACC. A combined WACC covers both the water activities and the electricity activities.

[1] ACM does not know yet whether WEB will continue electricity production after 2019, due to the discontinuation of the production by WEB with aggreko's. Therefore in this report, ACM will also calculate a WACC for the possibility in which WEB will no longer be active as an electricity producer for determining the suitable WACC per company. In case WEB remains an electricity producer, ACM will apply the WACC for electricity & water combined.

Table 2: Overview of suitable WACC per company

Company	Island	WACC
WEB	Bonaire	Electricity distribution & water combined, *or* Electricity & water combined
CG	Bonaire	Electricity, production only
STUCO	St. Eustasius	Electricity & water combined
SEC	Saba	Electricity, production and distribution

5. In the subsequent chapters, ACM sets out the methodology for calculating the WACC, and the results for the relevant parameters. All parameters combined are used to calculate the WACC. In this document, only the main results are presented. The report by European Economic Research Limited, with a more detailed calculation of the WACC, will be published alongside this report.

6. Since ACM sets yearly tariffs for the production and distribution of electricity and water in the Dutch Caribbean, ACM has decided to set a WACC upfront for each year separately. In this report, ACM will set the WACC for the three upcoming years. This is the period from January 1, 2020, up to and including December 31, 2022. These WACCs differ from year to year, since the Cost of Debt differs from year to year. This is explained in chapter 7.

7. A summary of the different parameters and resulting WACCs is given in table 3a to 3c.

Table 3a: Summary of WACC calculations 2020

Parameter	Electricity production & distribution	Electricity production only	Electricity & water combined	Electricity distribution & water combined
Tax	0%	0%	0%	0%
Gearing (D/A)	39%	38%	35%	35%
Asset beta	0.44	0.46	0.45	0.45
Equity beta	0.72	0.74	0.69	0.69
Risk-free rate (equity)	2.37%	2.37%	2.37%	2.37%
Equity risk premium	6.92%	6.92%	6.92%	6.92%
Cost of Debt (excl. non-interest fees)	3.91	3.91	3.91	3.91
Non-interest fees	0.15%	0.15%	0.15%	0.15%
Cost of Debt (pretax)	4.06	4.06	4.06	4.06
Nominal WACC (pretax)	6.08	6.20	6.08	6.08

Table 3b: Summary of WACC calculations 2021

Parameter	Electricity production & distribution	Electricity, production only	Electricity & water combined	Electricity distribution & water combined
Tax	0%	0%	0%	0%
Gearing (D/A)	39%	38%	35%	35%
Asset beta	0.44	0.46	0.45	0.45
Equity beta	0.72	0.74	0.69	0.69
Risk-free rate (equity)	2.37%	2.37%	2.37%	2.37%
Equity risk premium	6.92%	6.92%	6.92%	6.92%
Cost of Debt (excl. non-interest fees)	3.73	3.73	3.73	3.73
Non-interest fees	0.15%	0.15%	0.15%	0.15%
Cost of Debt (pretax)	3.88	3.88	3.88	3.88
Nominal WACC (pretax)	6.00	6.13	6.01	6.01

Table 3c: Summary of WACC calculations 2022

Parameter	Electricity production & distribution	Electricity, production only	Electricity & water combined	Electricity distribution & water combined
Tax	0%	0%	0%	0%
Gearing (D/A)	39%	38%	35%	35%
Asset beta	0.44	0.46	0.45	0.45
Equity beta	0.72	0.74	0.69	0.69
Risk-free rate (equity)	2.37%	2.37%	2.37%	2.37%
Equity risk premium	6.92%	6.92%	6.92%	6.92%
Cost of Debt (excl. non-interest fees)	3.61	3.61	3.61	3.61
Non-interest fees	0.15%	0.15%	0.15%	0.15%
Cost of Debt (pretax)	3.76	3.76	3.76	3.76
Nominal WACC (pretax)	5.96	6.08	5.97	5.97

1.1 Procedure

8. On July 9th 2019, ACM published the so-called draft WACC method.

9. In August 2019, ACM received questions and comments on this draft WACC method from:

    - ContourGlobal
    - WEB

These comments and the reaction of the ACM to those comments have been summarized in annex 3 of the method decision on electricity and drinking water in the Caribbean Netherlands 2020-2025.

10. These comments have not let to a change in the WACC attachment compared to the draft WACC attachment.

2 Purpose of using the WACC

11. Network tariffs are meant to compensate network operators and production companies for the costs they incur. Two types of costs can be distinguished: capital costs and operational costs. Capital costs consist of two components: a) the depreciation of assets, which is related to the aging of the assets, and b) the so-called opportunity costs of the investments in these assets. The opportunity costs consist of the benefits that investors in the firms could have received if they had invested in an alternative (the second-best) portfolio of assets. After all, by investing in a specific asset, such as an asset of an energy distribution company in the Caribbean Netherlands, the investor will not receive the benefits off investing that same amount of capital in some other asset(s). The return on the best alternative option is generally based on the return in financial markets for companies with activities similar to those of the company (regulated or otherwise) in question. This return is the so-called weighted average cost of capital (WACC), which is the calculated return that investors might be able to achieve by investing both debt and equity capital in similar assets in the market.

12. One consequence of the idea of opportunity costs is that ACM uses the perspective of investors as the starting point when calculating the WACC. Hence, the cost of capital of a specific investment in a specific industry is determined by what a group of relevant investors could earn in the market. By investing in this industry, these potential earnings in the market are their opportunity costs. In order to determine the opportunity costs of investing in the industries in the Caribbean Netherlands, ACM needs to define the group of potential investors as well as the capital markets in which they are active. The group of potential investors is not restricted to those investors that have already invested in the Caribbean Netherlands, but it includes all investors that could have a potential interest in the businesses in the Caribbean Netherlands. On the basis of theory as well as empirical evidence, we conclude that investors want to increase the diversification (e.g. geographic diversification) of the investment portfolio in order to reduce the risk of their specific investments. The risks that can be reduced through diversification are called ‘*non*-systematic risks’. The performance of an investment portfolio increases when it becomes more diversified over both countries *and* industries because this diversification mitigates and eventually eliminates the non-systematic risks.

13. The remaining risks are the so-called *systematic* risks, which are the risks that *cannot* be removed by diversification. Because of the presence of systematic risks, investors want to be compensated for their investments in excess of the risk-free interest rate. Similarly, providers of debt will also want to be compensated for their opportunity costs and risks on their invested capital (e.g. bankruptcy risk).

14. The equity-risk is the surplus return on a diversified portfolio of investments (i.e. the market index) above the risk-free interest rate. In order to determine the required return on investments in a specific business, one needs to determine how the risk and return of those business are related to the overall risk in the market. This relationship is called the beta. The beta for the regulated

companies in the Caribbean Netherlands can be determined by looking at the performance of the stocks of a group of businesses that are representative for the energy and drinking water companies. ACM selects businesses that are active in similar industries within a similar economic environment. In addition, the businesses preferably are subject to a regulatory regime. This group of selected businesses is called the peer group.

15. In order to determine the reference capital markets and the peer group, it is justified to assume that internationally active investors are interested to invest in companies in the Caribbean Netherlands if these investments improve the performance of their investment portfolios.

16. Moreover, ACM assumes that investors (alternatively) want to invest in the same region as the Caribbean Netherlands because of the same objective to diversify their portfolio geographically. This region consists of Latin America and the USA. The Caribbean Netherlands are part of the Kingdom of The Netherlands, in particular, it is a part of the country of The Netherlands. Therefore, ACM also makes the assumption that investors from Europe are potentially interested in investing in the Caribbean Netherlands. Hence, the European market is also a reference market to determine the opportunity costs.

17. In addition, ACM is of the opinion that the fact that the Caribbean Netherlands are part of The Netherlands influences the risks of companies in the Caribbean Netherlands (i.e. a lower risk). Being part of The Netherlands influences the situation – investors benefit from the institutional, judicial and governmental framework of The Netherlands. These characteristics should be included when estimating the opportunity costs of the potential investors and is best observable in a European context.

18. In conclusion, we define the capital markets in Latin America, USA and Europe together as the reference markets for determining the WACC of investments in the Caribbean Netherlands. Since there is no reason to assume these three regions should be weighted differently, ACM takes the average values of the risk-free rate, equity risk premium and cost of debt in these markets as the best estimate of the opportunity costs of investing in the Caribbean Netherlands.

3 Method

19. As stated in the previous chapter, the WACC gives the return that investors would achieve by investing both debt and equity capital in similar assets in the market. The WACC weights both capital parts by the following formula:

$$WACC = \left(1 - \frac{D}{A}\right) * R_e + \frac{D}{A} * (1 - T_c) * R_d$$

In which:
D/A = Gearing (Debt over Assets), percentage financed by debt (chapter 5.1)
Re = Return on equity (Chapter 6)
Rd = Return on debt (Chapter 7)
Tc = Percentage Tax (Chapter 5.2)

20. To calculate these different parts of the WACC, ACM uses the general ACM method as a starting point. This is a method that is used by different ACM departments for various regulated sectors, including energy and water regulation. At the start of each chapter, an explanation about the applied method for the specific parameters is given.

21. In the previous chapter, ACM explained that a peer group is needed for several parts of the WACC. ACM has asked European Economic Research Limited (EER) to determine these representative and up-to-date peer groups and to calculate the parameters of the WACC.

22. Most data used by EER to calculate the WACC are obtained from financial databases. For some parameters, other sources are also used, which will be mentioned in the report. Data through December 31, 2018 are used. The outcomes are based on calculations by EER. The outcomes of the calculations are presented in the tables in this report and in the appendices.

4 Peer group

23. The study by EER to determine the peer group is published with this report. EER advised ACM to use four different peer groups, since the regulated companies are involved in different activities. These activities are summarized in table 4.

Table 4. Activities of regulated entities

Company	Island	Electricity production	Electricity distribution	Water production	Water distribution	Peer group
WEB	Bonaire	?	V	V	V	Electricity distribution & water combined or electricity & water combined
CG	Bonaire	V	X	X	X	Electricity production only
STUCO	St. Eustasius	V	V	V	V	Electricity & water combined
SEC	Saba	V	V	X	X	Electricity production and distribution

24. The result of the EER study to construct the peer groups for each combination of activities is presented in tables 5, 6, 7 and 8. Peers with an asterisk are not included in the beta calculation, based on their bid-ask spread.[2] These peers are only used for determining the gearing.

[2] High bid-ask spreads indicate possibly illiquid shares of a company, which makes the calculated beta less reliable. EER excludes companies with a bid-ask spread over 1% from the beta calculation. The calculated gearing is not affected by the bid-ask spread.

Table 5. Peer group for electricity, production and distribution

Company	Country
American Electric Power Company, Inc.	US
Public Power Corporation S.A.	Greece
Eneva SA*	Brazil
PNM Resources, Inc.	US
Edison International	US
Eolus Vind AB	Sweden
AES Corp	US
VERBUND AG	Austria
EDP - Energias do Brasil S.A.	Brazil
EDP Renovaveis SA	Portugal
Pampa Energia SA	Argentina
Enel Americas SA	Chile

Table 6. Peer group for electricity, production only

Company	Country
CPFL Energias Renovaveis SA*	Brazil
Renova Energia SA*	Brazil
Zespol Elektrowni Patnow Adamow Konin SA	Poland
Eolus Vind AB	Sweden
Albioma	France
Clearway Energy Inc	US
Falck Renewables S.p.A.	Italy
Atlantic Power Corp*	US
Engie Brasil Energia S.A.	Brazil
EDP Renovaveis SA	Portugal
Pattern Energy Group Inc	US

Table 7. Peer group for electricity and water combined companies

Company	Country
American Electric Power Company, Inc.	US
Public Power Corporation S.A.	Greece
Eneva SA*	Brazil
PNM Resources, Inc.	US
Edison International	US
United Utilities Group PLC	UK
Severn Trent PLC	UK
Acea S.p.A.	Italy
Eolus Vind AB	Sweden
Aqua America, Inc.	US
AES Corp	US
VERBUND AG	Austria
California Water Service Group	US
EDP - Energias do Brasil S.A.	Brazil
Companhia de Saneamento do Parana SA	Brazil
EDP Renovaveis SA	Portugal
Middlesex Water Co	US
Companhia de Saneamento de Minas Gerais	Brazil
Aguas Andinas S.A.	Chile
Pampa Energia SA	Argentina
Enel Americas SA	Chile

Table 8. Peer group for electricity distribution and water combined companies

Company	Country
Public Power Corporation S.A.	Greece
United Utilities Group PLC	UK
Severn Trent PLC	UK
Acea S.p.A.	Italy
Aqua America, Inc.	US
AES Corp	US
VERBUND AG	Austria
California Water Service Group	US
EDP - Energias do Brasil S.A.	Brazil
Companhia de Saneamento do Parana SA	Brazil
Middlesex Water Co	US
Companhia de Saneamento de Minas Gerais	Brazil
Aguas Andinas S.A.	Chile
Pampa Energia SA	Argentina

5 Generic parameters

5.1 Gearing

25. The ACM method prescribes that the gearing will be determined based on peers with healthy financial positions. The same peers as mentioned before will be used for this purpose (chapter 0). To determine which peers have a healthy financial position[3], EER uses the credit rating of the peers. The credit rating represents the solvency of a firm.

26. To determine the gearing (debt over assets), the average over the available data from the period 2016 – 2018 is used. The following definitions are used for this determination[4]:

 Debt = net debt + total capital leases
 Equity = Market capitalization

27. Dividing the debt by the equity will result in the debt over equity ratio (D/E). To determine the gearing (Debt over Asset ratio (D/A)), the following formula is used:

$$D/_A = \frac{D}{D+E} = \frac{D/_E}{(1 + D/_E)}$$

28. Only the peers that have a credit rating and are investment-grade will be included in the calculation of the relevant gearing. This corresponds to an S&P credit rating of BBB- or higher or an equivalent credit rating from Moody's. Table 9 lists median gearing for the different peer groups.

Table 9. Gearing

Gearing	**Electricity production & distribution**	**Electricity, production only**	**Electricity & water combined**	**Electricity distribution & water combined**
Median gearing	39%	38%	35%	35%

5.2 Tax

29. Energy and drinking water companies are usually obliged to pay a corporate tax rate. To cover for these tax expenses, the ACM calculates a pre-tax WACC. In this way, the WACC includes the

[3] The ACM method prescribes that 'companies with healthy positions' are companies with a credit rating A or higher. Since this criterion would not lead to a sufficient number of companies in the current WACC determination, in line with the method in the previous period the ACM chooses to include all peers who are investment-grade.

[4] These definitions have been taken from: The WACC for KPN and FttH, Brattle, 1 July 2015.

expenses for the corporate tax rate. The ACM method prescribes that the tax rate is equal to the applicable tariff for the regulated entity. ACM looked at different taxes, including the so-called ‘Opbrengstbelasting’ that was used in the earlier WACC determination, and concluded that there is no tax rate on the Caribbean Netherlands that qualifies as a corporate tax rate. As result, ACM uses a tax rate of 0%.[5]

[5] This rate is confirmed by KPMG’s ‘Corporate tax rates table’.

6 Cost of Equity

30. The Cost of Equity is calculated by using the Capital Asset Pricing Model (CAPM). The CAPM is a model with which the expected return of the equity is calculated based on the average return on the market (the Equity Risk Premium), the risk-free rate and the beta of a company. The financial world and regulators consider the CAPM to be the most appropriate model for calculating the WACC. With the CAPM, it is possible to calculate the systematic risk that a company bears, and to exclude the non-systematic risks (see also chapter 2).

31. The formula of the CAPM is as follows:

$$R_e = R_f + \beta_e * ERP$$

In which:
Re = Return on equity
Rf = Risk-free rate (Chapter 6.1)
βe = Equity Beta (Chapter 6.2)
ERP = Equity Risk Premium (Chapter 6.3)

6.1 Risk-free rate

32. The risk-free rate is the return that is associated with the return on investing in a risk-free object. As, in practice, there is no such thing as a risk-free object, ACM uses a proxy. It is widely accepted that government bonds are in general the least risky objects. For calculating the risk-free rate for the Caribbean Netherlands, ACM takes the risk-free object for each of the reference markets. For each region, the government bond of the country with the lowest return is used, since this reflects the risk-free investment the best. Currently, those are Germany in Europe, the USA and Chile in Latin America.

33. In calculating the risk-free rate, ACM has to decide on the relevant historical reference period. Theoretically, the spot rate (the most recent, observed risk-free rate) should be the best indicator for tomorrow. However, the spot rate of the risk-free rate can be very volatile in a short-term period, which would lead to an outcome that might not be representative. Taking a longer reference period would lead to a more robust outcome.

34. Based on the consideration above, EER looks at a historical reference period of three years. This approach provides a mix between including recent market information available on the one hand and providing a more robust outcome on the other hand.

35. The risk-free rate is based on the average yield on a government bond with a maturity of ten years and based on daily observations. ACM uses government bonds with a maturity of ten years since ACM is of the opinion that the 10-year government bond is most suited as a proxy for the

risk-free rate as these are traded on more liquid markets and it is common in the financial markets to base the risk-free rate on government bonds with a ten year maturity. ACM has applied this method of determining the risk-free rate in many other regulated sectors.

36. Table 10 shows the nominal risk-free rate for each region. The average risk-free rate is equal to 2.37%.

Table 10: Risk-free rate (nominal)

	Europe	USA	Latin America
Average (2016 – 2018)	0.32	2.36	4.42
Overall average		**2.37**	

6.2 Beta

37. Under the CAPM, the beta parameter is used to measure the risk that the investor bears by investing in a specific company or activity relative to the risk of investing in the market portfolio.

38. The beta is measured as the correlation between the expected return of a specific asset and the expected return of the market portfolio. This correlation is known as the systematic risk associated with the asset, equating to the risk that an investor cannot diversify away by holding the market portfolio. Since expected returns are not observable, the beta is usually measured using historical returns of the asset and the market.

39. The ACM method prescribes that the equity beta is estimated based on the peers. Since EER identified four different peer groups that each bear different kinds of risks, beta estimates for each of the four activities are required to measure the systematic risk associated with each.

40. For these peers, the equity beta is estimated by taking the covariance between the return on the asset and the return of the market index where the asset is traded. In this case, daily data over a period of three years will be used. The results will be tested for autocorrelation and heterskedasticity, and are assessed against Dimson-corrected betas.[6]

41. The equity betas are influenced by the gearing of the specific peer. To remove the influence of debt, the asset beta is calculated. The asset beta gives the risk as if the company was financed by 100% equity. Therefore, the asset betas of the different companies are comparable to each other. The equity beta will be converted into an asset beta using the Modigliani Miller formula. Using this formula turns out to be the best approach, for example since it explicitly accounts for taxes.[7] The formula is as follows:

[6] The ACM tests for autocorrelation using the Breusch-Godfrey test. Heteroskedasticity is tested using the White test. Finally, the Dimson-corrected betas are computed, and an F-test is used to assess whether or not a Dimson adjustment is needed. For the companies for which an adjustment is needed, the Dimson betas are used.

[7] Fernandez, Levered and unlevered Beta, IESE Business School Research Paper, January 2003.

$$\beta_a = \frac{\beta_e}{1+(1-t)*(D/E)}$$

In which:
βa = Asset beta
βe = Equity Beta
t = corporate tax rate
D/E = gearing (chapter 5.1)

42. In this case, the applicable tax rate of the peer in question is used. This tax rate is calculated over the same period as the period used for the beta. The rates come from the Corporate Tax Rate Table that has been provided by KPMG.[8]

43. In normal circumstances, the equity beta will be higher than the asset beta, since the equity-holders bear the full risks over the assets. After all, the debt-holders, in normal circumstances, always get their compensation.

44. The asset betas that EER has calculated for the different peer groups are included in the table below.

Table 11: Asset beta

Asset beta	Electricity production & distribution	Electricity, production only	Electricity & water combined	Electricity distribution & water combined
Median asset beta	0.44	0.46	0.45	0.45

45. Finally, the applicable equity betas for the companies in the Caribbean Netherlands are calculated by converting the asset beta back into an equity beta, using the applicable tax rate of 0% (chapter 5.2) and the normative gearing (chapter 5.1). The results from this conversion can be found in table 12.

Table 12: Equity betas

Peer group	Asset beta	Gearing (D/A)	Tax	Equity beta
Electricity production and distribution	0.44	39%	0%	0.72
Electricity, production only	0.46	38%	0%	0.74
Electricity & Water combined	0.45	35%	0%	0.69
Electricity distribution & Water combined	0.45	35%	0%	0.69

[8] https://home.kpmg/dk/en/home/insights/2016/11/tax-rates-online/corporate-tax-rates-table.html

6.3 Equity risk premium

46. The Equity Risk Premium (ERP) represents the extra expected return of the market on top of a risk-free investment. Investors require an extra return as investing in the market is more risky than investing in the risk-free object.

47. The ACM method prescribes that this premium will be based on the historic ERP (*ex post*) and/or the expectations on the ERP (*ex ante*).

Historical ERP

48. The ERP is determined by several factors and circumstances in the capital market. By using historical data, it can be estimated what premium investors were able to get in the past in order to be compensated for such circumstances. Therefore, it is important to use a period of data that is as long as possible in order to determine the historical ERP. By using a long period of data, the ERP will reflect multiple circumstances that have occurred on the capital market in the past, and perhaps may occur in the future. Taking a long period of data prevents that the ERP will be distorted by specific market circumstances that occurred in some short time period. Therefore, a long period of data is assumed to be the best estimator (according to investors) for the future expected premium.

49. To calculate this historical ERP, EER uses ERP from the report of Dimson, Marsh and Staunton (DMS).[9] This is an extensive study on the level of the ERP during a period from 1900 to 2018.

50. Scientists are divided about the question whether the arithmetic average or the geometric average should be used to calculate the historical ERP.[10] Therefore, the ERP is calculated based on both methods (weighting: 50%). Both the arithmetic average as the geometric average of the ERP will be calculated based on the current market capitalization of each country's stock market.

51. Table 13 lists the arithmetic mean and geometric mean for the ERP using data from 1900 to 2018 for the Eurozone economies reported by DMS.[11] Each country's ERP is weighted by the current market capitalization of the main stock market in that country as of December 31, 2018, in line with a typical European investor's behavior of placing more weight in a portfolio on stocks in countries with larger stock markets.

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[9] Credit Suisse Research Institute, Credit Suisse Global Investment Returns Yearbook 2016.

[10] Smithers rapport (2003); P. Fernandez, The Equity Premium in 150 Textbooks, Journal of Financial Transformation, 2009, vol. 27, pages 14-18.

[11] Dimson, Marsh, Staunton (February 2016): "Credit Suisse Global Investment Returns Sourcebook 2016", p28. Note: (1) For Austria and Germany, statistics are based on 114 years, excluding 1921-22 for Austria and 1922-23 for Germany. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research. (2) Market Cap values are as of 29/03/2016, calculated by NERA, see 'Estimating the WACCs for FTR-MTR, July 2016.

Table 13: Equity risk premium DMS - Europe

	Geometric Mean	Arithmetic Mean	Average	Current Market Cap (€m)
Austria	2.70%	21.10%	11.90%	75,649
Belgium	2.10%	4.10%	3.10%	287,056
Finland	5.10%	8.60%	6.85%	235,325
France	3.00%	5.30%	4.15%	1,295,901
Germany	4.80%	8.20%	6.50%	877,699
Ireland	2.50%	4.50%	3.50%	77,488
Italy	3.10%	6.40%	4.75%	325,176
The Netherlands	3.20%	5.50%	4.35%	594,394
Portugal	5.10%	9.20%	7.15%	54,081
Spain	1.60%	3.60%	2.60%	444,178
Weighted Average Europe (Current)			**4.79%**	

52. Table 14 lists the arithmetic mean and geometric mean for the ERP using data from 1900 to 2018 for the USA reported by DMS. Since this is just a single economy, there is no need to calculate a weighted average using market caps.

Table 14: Equity risk premium DMS - USA

	Geometric Mean	Arithmetic Mean	Average
USA	4.3%	6.4%	5.35%

53. ACM prefers the use of DMS as the source to base the ERP on. However, DMS does not report any data about the ERP in Latin America. Since ACM believes that an ERP calculated without taking into account Latin America would underestimate the ERP for the Caribbean Netherlands,[12] EER uses the dataset of Damodaran to calculate the ERP for Latin America.[13] Damodaran calculates the ERP for almost all countries, but uses a different methodology than DMS. The Total Risk Premium of Latin America is calculated by EER at 10.61%.

[12] Many of the countries in Latin America are classified as emerging markets, such as Brazil and Chile. Emerging markets data provide special challenges, since the behavior of emerging market returns differs significantly from the developed equity market returns. It is a well-known fact that the average ERP in emerging markets is higher than that in developed markets, although the reasons as to why this is remain unclear. Also, the ERP for countries in Latin America are, on average, high compared with developed countries.
Sources: Bekaert, G., Erb, C. B., Harvey, C. R., & Viskanta, T. E. (1998). The behavior of emerging market returns. In *Emerging Market Capital Flows* (pp. 107-173). Springer US.
Donadelli, M., & Persha, L. (2014). Understanding emerging market equity risk premia: Industries, governance and macroeconomic policy uncertainty. *Research in International Business and Finance*, *30*, 284-309.
[13] *Country Default Spreads and Risk Premiums*, Last updated: January 2019.

54. Table 15 shows the Equity Risk Premium for each region. The average ERP is equal to 6.92%.

Table 15: Equity risk premium

	Europe	USA	Latin America
Average ERP	4.79	5.35	10.61
Overall average		**6.92**	

Ex ante ERP

55. It is expected that the ERP calculated over a period of 110 years will be overestimated. Markets have been more liquid over the past 20 years, and this should lead to lower premiums. Therefore, a downward adjustment is often made to the *ex ante* ERP.

56. On the other hand, *ex ante* estimates on the Equity Risk Premium (based on the Dividend Growth model) imply that the ERP estimation based on historical data is an underestimation and should be adjusted upwards.

57. ACM has no reason to assume that either one of these opposed effects is stronger. Therefore, the ERP will *not* be adjusted upward or downward. This is in line with other WACC decisions that ACM prepared or that different consultants have prepared for ACM.

7 Cost of Debt

58. The Cost of Debt will be calculated using the following formula:

$$R_d = R_f + DP + Fee$$

In which:

Rd = Return on Debt

Rf = Risk-free rate (Chapter 7.1)

DP = Debt Premium (Chapter 7.1)

Fee = Non-interest fee

7.1 Debt premium and risk-free rate

59. The debt premium is the difference between the risk-free rate and the cost of debt. It represents the return associated with the risk (extra or otherwise) of buying a company's bond over investing in the risk-free object. The ACM method prescribes calculating the debt premium based on the average credit spread on bonds of comparable companies with a maturity of ten years. For these comparable companies, EER found indices that represent these companies.

60. For each region, an index on the return on corporate bonds of BBB-rated utility companies has been identified.[14]

61. For calculating the cost of debt, ACM considers that companies have existing debt. ACM uses a model to compensate for the existing debt. ACM assumes that the portfolio of debt has obligations for ten years with an even spread of maturities. ACM also uses this method for calculating the WACC for energy regulation in the Netherlands.

62. The model makes a distinction between existing and new debt. This distinction is only relevant for the way in which the cost of debt for each specific year is calculated. For the existing debt, ACM uses the realized rates as described above. For new debt, ACM makes the same estimation as calculating the risk-free rate in chapter 6.1. Debt until 2018 is labelled as existing debt, debt as of 2019 is labelled as new debt. To calculate the WACC for 2020, the debt consists of 80% existing debt and 20% new debt, in 2021 of 70% existing debt and 30% new debt and in 2022 of 60% existing debt and 40% new debt. Table 16 illustrates this.

[14] In line with the gearing, the ACM deviates from the ACM method by choosing an index with a BBB-rating instead of an A-rating.

Table 16: Model

		2020	2021	2022
2010	Realized rates			
2011	Realized rates	10%		
2012	Realized rates	10%	10%	
2013	Realized rates	10%	10%	10%
2014	Realized rates	10%	10%	10%
2015	Realized rates	10%	10%	10%
2016	Realized rates	10%	10%	10%
2017	Realized rates	10%	10%	10%
2018	Realized rates	10%	10%	10%
2019	Estimated rates	10%	10%	10%
2020	Estimated rates	10%	10%	10%
2021	Estimated rates		10%	10%
2022	Estimated rates			10%
Part existing debt		80%	70%	60%
Part new debt		20%	30%	40%
Total debt		100%	100%	100%

63. All data to calculate the steps and the accompanying averages are summarized in table 17.

Table 17: Cost of debt

	Cost of debt		
	EU	US	LA
2011	4.68	4.32	6.62
2012	3.91	3.68	6.44
2013	3.51	3.95	6.43
2014	2.32	3.70	5.91
2015	1.59	3.65	5.68
2016	1.12	3.52	5.43
2017	1.33	3.61	4.81
2018	1.66	4.23	4.91
2019	1.37	3.79	5.05
2020	1.37	3.79	5.05
2021	1.37	3.79	5.05
2022	1.37	3.79	5.05
Average 2020	2.29	3.82	5.63
Average 2021	1.95	3.77	5.48
Average 2022	1.70	3.78	5.34
Overall average			
2020		3.91	
2021		3.73	
2022		3.61	

64. In line with the ACM method, the ACM adds 15 basis points to the resulting cost of debt to compensate for transaction costs. This results in a cost of debt including transaction costs of 4.06% in 2020, 3.88% in 2021 and 3.76% in 2022.

Final remarks

This WACC attachment is part of the “Method decision on electricity and drinking water in the Caribbean Netherlands 2020-2025”.

In this WACC attachment, ACM has described the manner in which the WACC for the Caribbean Netherlands has been determined.

The abovementioned method will be announced in the Government Gazette. Furthermore, the Netherlands Authority for Consumers and Markets will publish this WACC attachment on the Netherlands Authority for Consumers and Markets’ internet page.

The Hague,
Date:

The Netherlands Authority for Consumers and Markets
on its behalf,
original signed

dr. F.J.H. Don
Member of the Board