

Beta, gearing, ERP and cost of debt for Electricity and Water Companies in the Caribbean Netherlands

PREPARED BY

Dan Harris
Lucrezio Figurelli

PREPARED FOR

ACM

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I. Introduction and Summary

1. The Dutch Authority for Consumers and Markets (ACM) is responsible for regulating the production and distribution of electricity and water in the Dutch Caribbean islands of Bonaire, Saint Eustatius and Saba (jointly, the Caribbean Netherlands).
2. Each of the Dutch Caribbean islands has different arrangements, and the production and distribution of water and electricity is provided by four different companies: Water en Energiebedrijf Bonaire N.V. (WEB), ContourGlobal Bonaire B.V. (CGB), Statia Utility Company N.V. (STUCO), and Saba Electricity Company N.V. (SEC) (together “the Companies”). These four companies each provide a different combination of services: electricity production (EP), electricity distribution (ED), and water production and distribution (WPD).
3. In more detail:
 - a. **WEB (EP, ED, WPD)** is owned by the Public Entity of Bonaire and provides electricity and water production and distribution services in the island of Bonaire.
 - b. **CGB (EP only)** is a private company, part of the British company CG, is the main electricity producer in Bonaire. It uses wind energy and diesel generators to produce electricity that it sells at regulated prices to WEB.
 - c. **STUCO (EP, ED, WPD)** is owned by the Public Entity of Saint Eustasius and is the sole provider of electricity and water in the island of Saint Eustasius.
 - d. **SEC (EP, ED)** is owned by the Public Entity of Saba and provides electricity production and distribution services in the island of Saba.
4. In 2019, the ACM determined the regulatory method for the electricity and water companies in the Caribbean Netherlands for the regulatory period 2020-2025.¹ In the regulation, the ACM set the tariffs based on the efficient costs of the Dutch Caribbean companies, for which the Weighted Average Cost of Capital (WACC) is a key input. Simultaneous with the determination of the regulatory method, the ACM has also set the WACC for the period 2020-

¹ See ACM, [Methodebesluit elektriciteit en drinkwater Caribisch Nederland 2020-2025](#), 25 September 2019, case number ACM/18/034526.

2022. In 2022, the ACM commissioned The Brattle Group (Brattle) to calculate the nominal pre-tax WACC for electricity production, electricity distribution and water production and distribution in the Caribbean Netherlands for the remainder of the regulatory period 2023-2025 (2022 Brattle Report)².

5. The ACM is now seeking advice on the calculation of the WACC for the electricity and water companies in the Caribbean Netherlands for the next regulatory period starting in January 2026. Within this context, the ACM has commissioned Brattle to:
 - a. Select a peer group of comparable companies that are sufficiently liquid to allow a reliable beta estimate.
 - b. Estimate the asset beta and gearing for electricity production, electricity distribution and water production and distribution in the Caribbean Netherlands.
 - c. Estimate the equity risk premium (ERP).
6. The ACM instructed us to apply the current method, as determined in the last WACC decision and in the 2022 Brattle Report. Consistent with the current method, the ACM has asked us to estimate a different beta and gearing for each activity. The regulated companies in the Caribbean Netherlands differ from each other depending on whether they are active in the production and distribution of electricity and water. Accordingly, because these activities imply different risks, the ACM requires to determine the beta and gearing for three different activities: electricity production (EP), electricity distribution (ED), water production and distribution (WPD).
7. The ACM has further informed us that going forward it intends to update the risk-free rate and the cost of debt annually. For these parameters, the ACM has asked us to:
 - a. confirm whether the current method for calculating the risk-free rate (RFR) is still reasonable for regulated companies in the Caribbean Netherlands, and
 - b. provide a recommendation on how to update the cost of debt annually.

² See Dan Harris, Lucrezio Figurelli, Federico Guatri and Filippo Nezzo, "The WACC for Electricity and Water Companies in the Caribbean Netherlands for the years 2023-2025", May 2022 (available at: <https://www.acm.nl/sites/default/files/documents/rapport-brattle-the-wacc-for-electricity-and-water-companies-in-the-caribbean-netherlands-for-the-years-2023-2025.pdf>).

8. In preparing this report, we use data up to and including 28 February 2025 (measurement date), being the most recent data available at the time of our analysis.

A. Selection of the Peer Groups

9. We estimate a beta for each activity being, (1) electricity production, (2) electricity distribution and (3) water production and distribution. We can estimate a beta for each activity from publicly traded firms that derive a majority of their revenues from that activity. We refer to these companies as the ‘comparables’ or ‘peers’.
10. In this report, we start considering the peer groups of companies considered in our 2022 report on the WACC for the Dutch Caribbean companies and in the more recent report commissioned by the ACM on the WACC for drinking water companies in the Netherlands (the 2024 Brattle Drinking Water Report).³ From this group, we exclude companies that were delisted and companies operating primarily in the gas sector. We end up with an initial sample of 44 candidate peers. Table 1 provides the list of candidate peers.
11. To identify the companies that derive a majority of their revenues from one of the relevant activities – electricity production, electricity distribution and water production and distribution – we review Bloomberg’s company descriptions and the revenue splits by activity reported in their annual accounts. We then exclude companies engaged in more than one activity. Application of this criterion leads to the exclusion of 11 companies.
12. We check whether the remaining companies are sufficiently liquid to ensure a reliable beta estimate. Specifically, we calculate the average bid-ask spread of each candidate peer over the reference period and exclude companies with a bid-ask spread higher than 1%. Application of this criterion led to the exclusion of 3 companies.
13. We further consider two additional screening tests to ensure a reliable beta estimate. Specifically, we check that the credit rating of the candidate peers is not below investment grade and that the companies were not involved in substantial M&A activity. Application of these two additional criteria leads to the exclusion of one company.

³ See Dan Harris, Lucrezio Figurelli and Gleb Kolotvin, “The WACC for Drinking Water Companies in the Netherlands”, October 2024 (available at: <https://www.acm.nl/system/files/documents/bijlage-1-brattle-drinking-water-report.pdf>).

14. Overall, the final sample includes 7 companies for electricity production, 7 companies for electricity distribution and 15 companies for water production and distribution. Note that for electricity production we use companies that face price and volume risk. The beta for these companies is likely to overstate the actual beta for electricity production in the Caribbean Netherlands, where prices are regulated, and the firms face little volume risk.
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B. Beta and Gearing

15. ACM's methodology specifies a three-year daily sampling period for the beta. Accordingly, we estimate equity betas for the peer group of firms by regressing the daily returns of individual stocks on market returns over the last three years. We calculate market returns by reference to regional or broad national indices. We perform a series of diagnostic tests to assess if the beta estimates satisfy the standard conditions underlying ordinary least squares regression and apply an adjustment for market imperfections. We calculate asset betas by un-levering the estimated equity betas using the Modigliani and Miller formula.
16. Consistent with the three-year reference period used to estimate the beta, we calculate the gearing of each comparator as the three-year average of quarterly gearing ratios obtained dividing quarterly net debt over quarterly market capitalization.
17. We calculate beta and gearing for the three standalone activities using the median asset beta and median gearing of the three peer groups:
- a. For electricity production we select the median asset beta of 0.64 and the median gearing of 48%.
 - b. For electricity distribution we select the median asset beta of 0.51 and the median gearing of 66%.
 - c. For water production and distribution, we select the median asset beta of 0.37 and the median gearing of 42%.

C. Equity Risk Premium

18. Consistent with the current method, we calculate the equity risk premium (ERP) for the Dutch Caribbean companies as the average of the ERP estimated for Latin America, the US and Europe.
19. We calculate the ERP for the US and Europe in line with the general ACM method, based on long-term historical data on the excess return of shares over long-term bonds, using historical data published by Dimson, Marsh and Staunton (DMS). Specifically, we select the average of the arithmetic and geometric averages of the realized ERP in the US and Europe.
20. Because DMS does not report any data about the ERP for Latin America, in line with the current method, we consider the ERP estimate reported by Damodaran for this region. To ensure consistency between the RFR and the ERP, we adjust Damodaran's ERP estimate – which calculates the ERP relative to 10-year US government bonds rates – to be consistent with a 20-year bond.
21. By taking the simple average of the ERP for Europe, the US and Latin America we derive an ERP of 6.57%. We use this value in our WACC calculations.

D. Risk-free Rate Methodology

22. The ACM has asked us to confirm whether the current method for calculating the RFR, which considers the yields of 20-year US government bonds, is still reasonable for regulated companies in the Caribbean Netherlands.
23. As we explained in our 2022 report, the regulated businesses in the Caribbean Netherlands operate using US dollars. Accordingly, the risk-free rate should be a return on a bond denominated in US dollars. From the perspective of a US dollar investor, returns on bonds denominated in other currencies would not be risk-free, and so are not relevant to determining the risk-free rate.
24. Given that the ACM regulates the businesses in the Caribbean Netherlands, and that we should measure the risk-free rate by reference to a return in dollars, the ideal measure of the risk-free rate for regulated businesses in the Caribbean Netherlands would be the yield on a Dutch government bond issued in US dollars. However, no such bonds exist at present.

25. In practice, both the US and the Netherlands have very low levels of country/regulatory risk, and using the yield on US government bonds will provide the most accurate estimate of a risk-free rate for a regulated businesses in the Caribbean Netherlands.
26. As regards the maturity of the bonds considered, the use of a 20-year maturity is consistent with the general ACM method, ensures consistency with the calculation of the ERP and results in a cost of equity that better matches empirical tests of the Capital Asset Pricing Model (CAPM).

E. Cost of Debt Methodology

27. The ACM has asked us to assess the current cost of debt methodology and provide a recommendation on how to update the cost of debt annually.
28. ACM's current methodology calculates the cost of debt for the Dutch Caribbean companies based on the staircase model, by reference to the yields for a set of BBB-rated corporate bonds with a maturity of about ten years issued in the Caribbean region and traded in US dollars.
29. To update the cost of debt annually, the ACM could in principle maintain the current method and recalculate the cost of debt annually starting from a predetermined set of comparable bonds. We note, however, that there are several implementation issues that the ACM would face following this approach.
30. Hence, we recommend the ACM to take an alternative approach and calculate the cost of debt as the sum of the yield of a US 10-year utility index and a spread over the utility index reflecting the additional cost of issuing debt for a company operating in US dollars in the Caribbean region. The spread can be calculated taking the average spread over the utility index for a set of comparable bonds over the relevant years for the staircase model. The spread would be calculated before the start of the regulatory period and maintained throughout the period. The proposed approach would be simpler, more transparent and predictable than the current approach, as the ACM would only need to calculate annually the yield on the utility, and at the same time it would adequately reflect the cost of US dollar debt for companies operating in the Caribbean.

31. Consistent with our recommendation, we have calculated that the average spread between a list of comparable BBB bonds issued by companies operating in the Caribbean region and a US BBB 10-year utility index (the IGUUUB10 BVLI Index) over the 8-year period March 2017-February 2025 was equal to 0.80%. We recommend the ACM to apply this value in its cost of debt calculations.

II. Selection of the Peer Groups and Screening Tests

A. Potential Peers

32. The regulated companies in the Caribbean Netherlands are not listed on a stock exchange. Therefore, to estimate the beta parameter, we need to find publicly traded firms with similar systematic risk to the Dutch Caribbean companies. We estimate a beta for each activity being:
 - a. Electricity production (EP).
 - b. Electricity distribution (ED).
 - c. Water productions and distribution (WPD).
33. We can estimate a beta for each activity from publicly traded firms that derive the majority of their revenues from that activity. We refer to these companies as the ‘comparables’ or ‘peers’.
34. In determining the number of peers, there is a trade-off. On the one hand, adding more peers to the group reduces the statistical error in the estimate of the beta. On the other hand, as more peers are added, there is a risk that they may have a different systematic risk than the regulated firms, which makes the beta estimate less accurate. In statistical terms, once we have 6-7 peers in the group the reduction in the error from adding another firm is relatively small.
35. In this report, we start considering the peer groups of companies considered in our 2022 report on the WACC for the Dutch Caribbean companies and the 2024 Brattle Drinking Water Report, which included 50 companies engaged in a combination of electricity and water, production and distribution activities. From this group, we exclude Albioma SA, and Falck

Renewables SpA and EDP – Energias Do Brasil SA because they were delisted.⁴ We then exclude Enagas, Fluxys Belgium and Snam SpA as these companies are primarily active in the gas sector. We end up with an initial sample of 44 candidate peers. Table 1 provides the list of candidate peers.

36. To identify the companies that derive a majority of their revenues from one of the relevant activities – electricity production, electricity distribution and water production and distribution – we review Bloomberg’s company descriptions and the revenue splits by activity reported in their annual accounts. We assess whether each candidate peer is primarily engaged in only one of the three activities, and exclude companies engaged in more than one activity.⁵ Application of this criterion led to the exclusion of 11 companies.
37. Table 1 details the main activity of each candidate peer for the three activities and the companies that were excluded from the sample because engaged in multiple activities. We are left with 9 companies for electricity production, 7 companies for electricity distribution, and 17 companies for water production and distribution. We further check whether the remaining companies are sufficiently liquid to ensure a reliable beta estimate, which we describe in the following section of the report.

TABLE 1: POTENTIAL PEERS GROUP

			ACM 2022 Potential Peers [A]	Revenue Segments			
				EP [B]	ED [C]	WPD [D]	Other businesses [E]
Clearway Energy Inc	United States	[1]	✓	✓			

⁴ In particular, Albioma SA was delisted in October 2022, Falck Renewables SpA was delisted in May 2022, and EDP – Energias Do Brasil SA was delisted in July 2023. See <https://www.albioma.com/wp-content/uploads/2022/09/Press-release-relating-to-the-squeeze-out-procedure-for-the-shares-and-warrants-of-Albioma.pdf>, <https://finanza.lastampa.it/News/2022/04/11/falck-renewables-al-via-lopa-per-il-delisting/MTFfMjAyMi0wNC0xMV9UTEI>; EDP moves forward with the delisting of EDP - Energias do Brasil S.A. following Tender Offer results in which EDP reached a stake of 88% | [edp.com](https://www.edp.com).

⁵ For this report, we considered a company to be ‘primarily engaged’ in one of the three activities if the company derived more than 70% of its revenues from the specific activity. In practice, most of the companies considered in each peer group derived more than 80% or 90% of revenues from the relevant activity. On the other hand, detailed information of the revenue breakdown for the excluded companies was not always available. In these instances, we decided to exclude the company because the company descriptions clearly indicated that the companies were multi-utilities. The ‘cut-off’ level of revenue for when we consider a company to be primarily engaged in a given activity will always involve a trade-off between the number of companies that remain in the peer group after we apply the cut-off criteria and the representativeness of each company.

Edp Renovaveis SA	Spain	[2]	✓	✓		
ENGIE Brasil Energia SA	Brazil	[3]	✓	✓		
Edison International	United States	[4]	✓	✓		
Endesa SA	Spain	[5]	✓	✓		
Renova Energia SA	Brazil	[6]	✓	✓		
Verbund AG	Austria	[7]	✓	✓		
Eneva SA	Brazil	[8]	✓	✓		
Eolus Vind AB (publ)	Sweden	[9]	✓	✓		
CPFL Energia SA	Brazil	[10]	✓		✓	
Enel Americas SA	Chile	[11]	✓		✓	
Elia Group SA/NV	Belgium	[12]	✓		✓	
National Grid PLC	United Kingdom	[13]	✓		✓	
Redeia Corp SA	Spain	[14]	✓		✓	
REN - Redes Energeticas Nacionais	Portugal	[15]			✓	
Terna-Rete Elettrica Nazionale	Italy	[16]	✓		✓	
Aguas Andinas	Chile	[17]	✓			✓
Artesian Resources Corp	United States	[18]				✓
American Water Works	United States	[19]	✓			✓
American States Water Co	United States	[20]				✓
Cia Saneamento Minas Gerais	Brazil	[21]	✓			✓
California Water Service	United States	[22]	✓			✓
Thessaloniki Water and Sewerage Company SA	Greece	[23]				✓
Athens Water Supply & Sewage	Greece	[24]	✓			✓
Eaux de Royan SA	France	[25]				✓
Middlesex Water Co	United States	[26]	✓			✓
Pennon Group PLC	United Kingdom	[27]	✓			✓
Cia Saneamento Do Parana	Brazil	[28]	✓			✓
SJW Group	United States	[29]	✓			✓
Severn Trent PLC	United Kingdom	[30]	✓			✓
AS Tallinna Vesi	Estonia	[31]				✓
United Utilities Group	United Kingdom	[32]	✓			✓
York Water Co	United States	[33]				✓

Companies Excluded Because of Multi-Utilities

Iberdrola SA	Spain	[34]	✓	✓	✓		
SSE PLC	United Kingdom	[35]	✓	✓	✓		
Hera SpA	Italy	[36]	✓	✓	✓		✓
Acea SpA	Italy	[37]	✓	✓	✓	✓	
American Electric Power	United States	[38]	✓	✓	✓		
Aes Corp	United States	[39]	✓	✓	✓		
Pampa Energia SA	United States	[40]	✓	✓			✓
TXNM Energy Inc	United States	[41]	✓	✓	✓		
Public Power Corporation SA	Greece	[42]	✓	✓	✓		
Zespol Elektrowni Patnow Ada	Poland	[43]	✓	✓			✓
Essential Utilities Inc	United States	[44]	✓			✓	✓

38. In line with the 2022 WACC decision, we include potential peers from Europe, the US and South America. Based on the most recent descriptions from Bloomberg and S&P Capital IQ, we now classify Eneva SA and Eolus Vind AB (publ) as companies primarily engaged in electricity production activities, while we classify Iberdrola SA, SSE PLC, Hera SpA and Essential Utilities Inc. as multi-utilities. Moreover, our sample of final peers includes 7 additional peers which were not considered in our 2022 report but were considered in the 2024 Brattle Drinking Water Report. We classify six of these companies as water production and distribution companies⁶ and one as an electricity distribution company.⁷
39. We note that the sample of firms that represent electricity production include firms that sell electricity in competitive markets. In a competitive market, if there is a fall in demand due to, for example, an economic recession, then the companies will sell a lower volume of electricity. That is, the generating companies have volume risk.
40. In contrast, revenues from electricity production in the Caribbean Netherlands are regulated. Specifically, companies that generate and sell electricity in the Caribbean Netherlands are largely insulated against volume risk. Within limits, if the volume of electricity the companies sell is lower than forecast, it will be able to increase prices to recover the lost revenue. Accordingly, due to limited volume risk, we would expect the activity of regulated electricity production in the Caribbean Netherlands to have a lower systematic risk than reflected by the betas of unregulated companies selling electricity in a free market.
41. Rather, the actual beta for regulated electricity production and sales in the Caribbean Netherlands would logically be closer to the beta for regulated electricity distribution companies. As we discuss below, we find that the asset beta for electricity production is 0.64, while the asset beta for electricity distribution is lower at 0.51. That the electricity distribution beta is lower makes sense, as electricity distribution has lower volume risk, particularly in Europe.
42. Nevertheless, we maintain the current approach and use the electricity production peers – which are all unregulated – to estimate a beta for regulated electricity production and sales in the Caribbean Netherlands. For the reasons given above, this approach is likely to

⁶ Artesian Resources Corp, American States Water Co, Thessaloniki Water and Sewerage Company SA, Eaux de Royan SA, AS Tallinna Vesi, York Water Co.

⁷ REN - Redes Energeticas Nacionais.

overestimate the true beta for regulated electricity production and sales in the Caribbean Netherlands.

B. Liquidity Tests

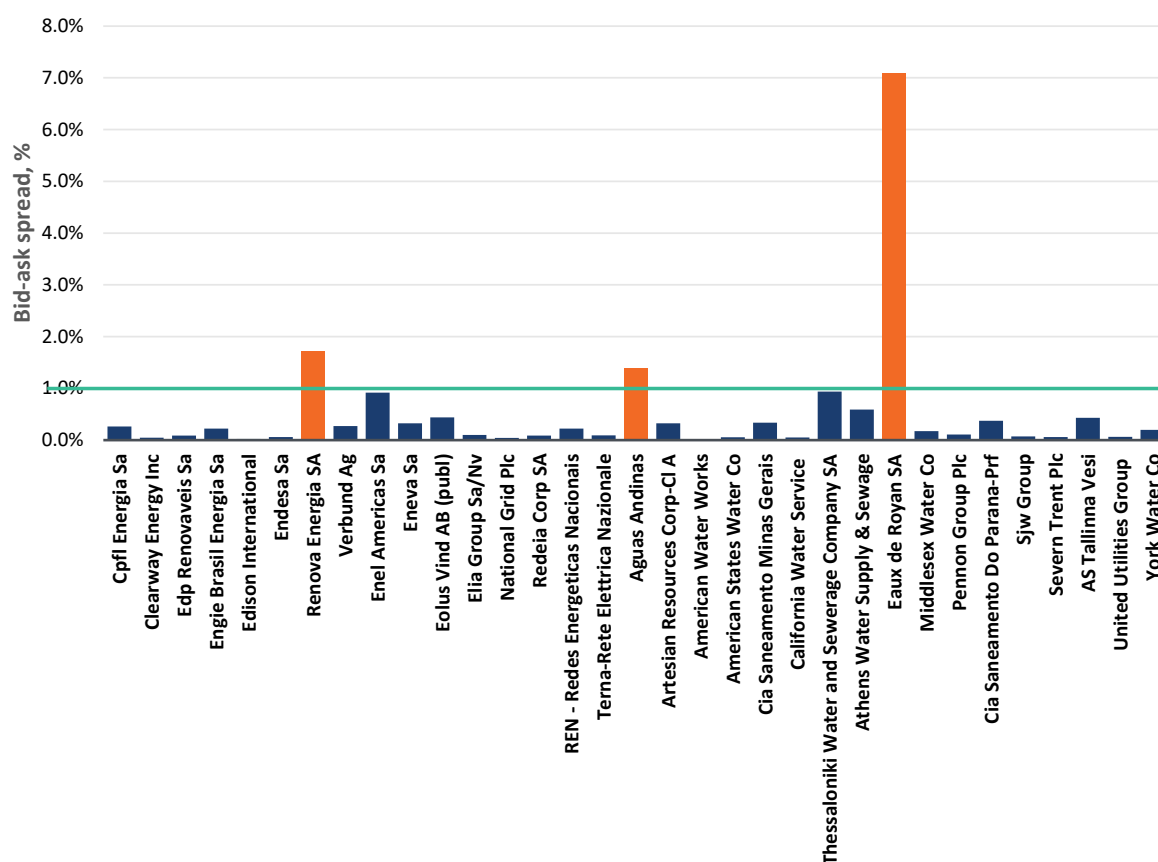
43. Illiquid stocks tend to underestimate the true industry beta.⁸ Hence, for each of the potential peers in the initial sample, we test to see if the firms' shares are sufficiently liquid.
44. Since 2021, the ACM methodology requires to apply a bid-ask spread threshold of 1% as the primary liquidity criterion.⁹ Accordingly, we calculate the average bid-ask spread as a percentage of the stock price over the reference period 1 March 2022 – 28 February 2025.¹⁰
45. As illustrated in Figure 1, the 1% cut-off leads to the exclusion of three companies: Renova Energia SA and Aguas Andinas SA and Eaux de Royan SA.

⁸ To understand why this is true, for example, consider a firm with a true beta of 1.0, so that the firm's true value moves exactly in line with the market. Now suppose that the firm's shares are traded only every other day. In this case, the firm's actual share price will only react to news the day after the market reacts. This will give the impression that the firm's value is not well correlated with the market, and the beta will appear to be less than one. Using weekly returns to calculate beta mitigates this problem, since it is more likely that the firm's shares will be traded in the week. However, using weekly returns have other disadvantages, such as providing 80% less data points over any given period.

⁹ Historically, the ACM methodology applied two criteria to test for liquidity. First, the shares of the candidate peers had to be traded on at least 90% of the days in which the relevant market index traded over the reference period (the number of trading days test). Second, the ACM methodology required that the candidate peers had annual revenues of at least € 100 million (the annual revenue requirement), on the basis that firms with larger revenues are likely to have shares that are liquidly traded. Later, in response to a court ruling, the ACM commissioned a study to provide a recommendation on the appropriate criteria to select peers for efficient beta estimation. The study determined that a bid-ask spread threshold of 1% should be applied as the primary liquidity criterion. We have applied this criterion in all recent reports for the ACM.

¹⁰ More specifically, we calculate the daily value of the bid-ask spread as the difference between bid price and ask price at closing divided by the average between the bid price and the ask price. We then calculate the simple average of the daily bid-ask spreads over the relevant period.

FIGURE 1: BID-ASK SPREAD



46. We consider two additional screening tests to ensure a reliable beta estimate. Specifically, we check that the credit rating of the candidate peers is not below investment grade and that the companies were not involved in substantial M&A activity. Share prices of firms with lower credit ratings tend to be more reactive to company-specific news. This will lower the measured beta, in a way that may not be representative of the Dutch Caribbean companies. Similarly, substantial M&A activity will tend to affect a firm's share price in a way that is unrelated to the systematic risk of the business. Hence, the observed beta for a firm with substantial M&A activity will tend to underestimate the true beta for a firm with the same business activity absent M&A activity. Accordingly, we would exclude firms that have been involved in 'substantial' mergers and acquisitions (M&A) during the period for which data is used to calculate the beta.¹¹ Application of these two additional criteria led to the exclusion of Clearway Energy Inc., because the company has a credit rating of BB.

¹¹ We define a 'substantial' M&A activity as a transaction involving more than 30% of the average market capitalization of the firm in the thirty days preceding the transaction and having a noticeable effect on the daily returns of the stock price.

C. The Final Peer Groups

47. In Table 2, below, we provide a summary of the final peer groups. Overall, the final sample includes 7 companies for electricity production, 7 companies for electricity distribution and 15 companies for water production and distribution.

TABLE 2: FINAL PEERS GROUP

		Country [A]	Region [B]
Electricity Production			
Edp Renovaveis SA	[1]	Spain	Europe
ENGIE Brasil Energia SA	[2]	Brazil	Latin America
Edison International	[3]	United States	United States
Endesa SA	[4]	Spain	Europe
Verbund AG	[5]	Austria	Europe
Eneva SA	[6]	Brazil	Latin America
Eolus Vind AB (publ)	[7]	Sweden	Europe
Electricity Distribution			
CPFL Energia SA	[8]	Brazil	Latin America
Enel Americas SA	[9]	Chile	Latin America
Elia Group SA/NV	[10]	Belgium	Europe
National Grid PLC	[11]	United Kingdom	Europe
Redeia Corp SA	[12]	Spain	Europe
REN - Redes Energeticas Nacionais	[13]	Portugal	Europe
Terna-Rete Elettrica Nazionale	[14]	Italy	Europe
Water			
Artesian Resources Corp	[15]	United States	United States
American Water Works	[16]	United States	United States
American States Water Co	[17]	United States	United States
Cia Saneamento Minas Gerais	[18]	Brazil	Latin America
California Water Service	[19]	United States	United States
Thessaloniki Water and Sewerage Company SA	[20]	Greece	Europe
Athens Water Supply & Sewage	[21]	Greece	Europe
Middlesex Water Co	[22]	United States	United States
Pennon Group PLC	[23]	United Kingdom	Europe
Cia Saneamento Do Parana	[24]	Brazil	Latin America
SJW Group	[25]	United States	United States
Severn Trent PLC	[26]	United Kingdom	Europe
AS Tallinna Vesi	[27]	Estonia	Europe
United Utilities Group	[28]	United Kingdom	Europe
York Water Co	[29]	United States	United States

III. Beta and Gearing

A. Peer Groups Equity Betas

48. ACM's methodology specifies a three-year daily sampling period for the beta. Accordingly, we estimate equity betas for the peer group of firms by regressing the daily returns of individual stocks on market returns over the last three years.¹²
49. The relative risk of each peer, as summarised in its beta parameter, must be measured against an index representing the overall market. Because investors tend to invest more in countries that are geographically close and tend to diversify their portfolios within a single currency zone so as to avoid exchange rate risk, we calculate market returns by reference to regional or broad national indices. Using indices from the relevant region or currency zone avoids exchange rate movements or differences in market trading hours depressing the betas and should result in a more reliable beta estimate than if we estimated betas against a world index or an index in a different currency. However, in the case of Latin America, we opt to use a regional multi-currency index, to avoid underestimating beta because national indices in Latin America are not sufficiently broad industrial indices.¹³
50. Specifically, we use the STOXX Europe 600 (SXXP Index) for European companies, the S&P 500 (SPX Index) for US companies, the FTSE All-Share index (ASX Index) for UK companies and the FTSE Latin America All Cap (ACLAMERS Index) for Latin American companies.
51. We perform a series of diagnostic tests to assess if the beta estimates satisfy the standard conditions underlying ordinary least squares regression. We test for autocorrelation using the Breusch-Godfrey test but rely on the OLS estimate of the beta parameter even in the presence

¹² As mentioned above, we use the three-year period 1 March 2022 through 28 February 2025 as our estimation window for the beta of all firms on the peer group.

¹³ This approach is consistent with our 2022 report, where we explained that the use of national indices resulted in a lower beta for four of the five Latin American companies considered. See 2022 Brattle Report, footnote 20.

of autocorrelation.¹⁴ We test for the presence of heteroscedasticity using the White's test and use White's-Huber robust standard errors.

52. In addition to the above diagnostic tools and adjustment procedures, we apply a test for market imperfections. This test requires us to use a weekly beta instead of the daily beta, if it appears that share prices react to news the day before or the day after the market index reacts. This could occur because of differences in market opening times and trading hours, or differences in the liquidity of the firm's shares relative to the average liquidity of the market. If such an effect is present, a beta estimated using daily returns on the firm's share and on the market index may be biased. Similarly, financial market frictions caused by information asymmetries, transaction costs, limit orders, and overreaction to news may also affect the way information is incorporated in the share price. In contrast, weekly betas are less sensitive to the speed at which share prices assimilate information, because they use returns over five trading days.
53. If the market is perfectly efficient, all information should be dealt with on the same day. The test for market imperfections requires to regress a company's daily returns using the market index returns one day before and one day after as additional regressors. If the lag or the lead coefficients are either significantly different from zero or jointly significantly different from zero, this suggests that information about the true beta may be lost by considering only the simple regression. This problem is addressed using weekly data to estimate the equity beta.
54. We have performed this test for the firms in our peer groups. The test is significant for four firms out of the total sample. Hence for these firms we take the weekly beta.¹⁵ For the remaining firms we take the daily beta. Table 3 shows our results. Overall, the equity betas range between 0.57 (Endesa SA) and 1.62 (Eolus Vind AB (publ)) for electricity production, between 0.21 (REN - Redes Energeticas Nacionais SA) and 0.94 (Elia Group SA/NV) for electricity distribution, and between 0.11 (AS Tallinna Vesi) and 1.02 (Cia Saneamento Minas Gerais) for water production and distribution.

¹⁴ We test for autocorrelation up to ten lags. Note that the OLS estimator of the beta is unbiased (not systematically too high or too low) and consistent (converges to the correct value) even in the presence of autocorrelation.

¹⁵ The weekly beta is higher than the daily beta for all the four companies. In particular: the weekly beta of Edp Renovaveis SA (1.00) compares to a daily beta of 0.78; the weekly beta of Eolus Vind AB (publ) (1.62) compares to a daily beta of 1.36; the weekly beta of Elia Group SA/NV (0.94) compares to a daily beta of 0.58; the weekly beta of National grid PLC (0.91) compares to a daily beta of 0.57.

TABLE 3: EQUITY BETAS

	Region		Beta [A]	Robust Standard Error [B]	Beta chosen [C]
Electricity production					
Edp Renovaveis SA	Europe	[1]	1.00	0.18	Weekly
ENGIE Brasil Energia SA	Latin America	[2]	0.84	0.03	Daily
Edison International	United States	[3]	0.60	0.05	Daily
Endesa SA	Europe	[4]	0.57	0.05	Daily
Verbund AG	Europe	[5]	0.65	0.09	Daily
Eneva SA	Latin America	[6]	1.18	0.05	Daily
Eolus Vind AB (publ)	Europe	[7]	1.62	0.30	Weekly
Electricity distribution					
CPFL Energia SA	Latin America	[8]	0.92	0.04	Daily
Enel Americas SA	Latin America	[9]	0.63	0.04	Daily
Elia Group SA/NV	Europe	[10]	0.94	0.17	Weekly
National Grid PLC	Europe	[11]	0.91	0.12	Weekly
Redeia Corp SA	Europe	[12]	0.40	0.05	Daily
REN - Redes Energeticas Nacionais	Europe	[13]	0.21	0.04	Daily
Terna-Rete Elettrica Nazionale	Europe	[14]	0.56	0.05	Daily
Water					
Artesian Resources Corp	United States	[15]	0.42	0.06	Daily
American Water Works	United States	[16]	0.61	0.04	Daily
American States Water Co	United States	[17]	0.50	0.05	Daily
Cia Saneamento Minas Gerais	Latin America	[18]	1.02	0.05	Daily
California Water Service	United States	[19]	0.53	0.05	Daily
Thessaloniki Water and Sewerage Company SA	Europe	[20]	0.37	0.06	Daily
Athens Water Supply & Sewage	Europe	[21]	0.42	0.06	Daily
Middlesex Water Co	United States	[22]	0.60	0.06	Daily
Pennon Group PLC	Europe	[23]	0.83	0.09	Daily
Cia Saneamento Do Parana	Latin America	[24]	0.82	0.04	Daily
SJW Group	United States	[25]	0.42	0.05	Daily
Severn Trent PLC	Europe	[26]	0.62	0.06	Daily
AS Tallinna Vesi	Europe	[27]	0.11	0.03	Daily
United Utilities Group	Europe	[28]	0.62	0.06	Daily
York Water Co	United States	[29]	0.43	0.05	Daily

Source: Brattle elaboration on Bloomberg data.

B. Peer Groups Gearing and Asset Betas

55. As well as reflecting the systematic risk of the underlying business, equity betas also reflect the risk of debt or financial leverage. As debt is added to the company, the equity will become riskier as more cash from profits goes towards paying debt in each year before dividends can be distributed to equity. With more debt, increases or decreases in a firm's profit will have a larger effect on the value of equity. Hence if two firms engage in the same activity, but one firm has more debt, that firm will have a higher equity beta than the firm with less debt.
56. To measure the relative risk of the underlying asset on a like-for-like basis it is necessary to 'unlever' the betas, imagining that the firm is funded entirely by equity. The resulting beta is referred to as an asset beta or an unlevered beta. To accomplish the un-levering, the methodology specifies the use of the Modigliani and Miller formula.¹⁶
57. Consistent with the three-year reference period used to estimate the beta, we calculate the gearing of each comparator as the three-year average of quarterly gearing ratios obtained dividing quarterly net debt over quarterly market capitalization.
58. Table 4 reports the equity beta, the gearing and the resulting asset betas for each firm. Overall, we find that:
- a. Electricity production: the asset beta ranges between 0.31 and 1.34, with a median asset beta of 0.64. The gearing ranges between 9% and 129%, with a median gearing of 48%.
 - b. Electricity distribution: the asset beta ranges between 0.11 and 0.68, with a median asset beta of 0.51. The gearing ranges between 31% and 139%, with a median gearing of 66%.
 - c. Water production and distribution: the asset beta ranges between 0.09 and 0.76, with a median asset beta of 0.37. The gearing ranges between 0% and 167%, with a median gearing of 42%.

¹⁶ The specific construction of this equation was suggested by Hamada (1972) and has three underlying assumptions: A constant value of debt; a debt beta of zero; that the tax shield has the same risk as the debt.

TABLE 4: EQUITY AND ASSET BETAS

	Region		Equity beta [A]	Gearing (D/E) [B]	Tax Rate [C]	Asset beta [D]	Beta chosen [E]
Electricity production							
EDP Renovaveis SA	Europe	[1]	1.00	46%	25%	0.75	Weekly
ENGIE Brasil Energia SA	Latin America	[2]	0.84	49%	34%	0.64	Daily
Edison International	United States	[3]	0.60	129%	26%	0.31	Daily
Endesa SA	Europe	[4]	0.57	48%	25%	0.42	Daily
Verbund AG	Europe	[5]	0.65	9%	24%	0.61	Daily
Eneva SA	Latin America	[6]	1.18	86%	34%	0.75	Daily
Eolus Vind AB (publ)	Europe	[7]	1.62	27%	21%	1.34	Weekly
Median		[8]	0.84	48%	25%	0.64	
Electricity distribution							
CPFL Energia SA	Latin America	[9]	0.92	55%	34%	0.68	Daily
Enel Americas SA	Latin America	[10]	0.63	31%	27%	0.51	Daily
Elia Group SA/NV	Europe	[11]	0.94	92%	25%	0.56	Weekly
National Grid PLC	Europe	[12]	0.91	105%	23%	0.51	Weekly
Redeia Corp SA	Europe	[12]	0.40	66%	25%	0.27	Daily
REN - Redes Energeticas Nacionais	Europe	[13]	0.21	139%	32%	0.11	Daily
Terna-Rete Elettrica Nazionale	Europe	[14]	0.56	63%	28%	0.38	Daily
Median		[15]	0.63	66%	27%	0.51	
Water							
Artesian Resources Corp	United States	[16]	0.42	42%	26%	0.32	Daily
American Water Works	United States	[17]	0.61	46%	26%	0.46	Daily
American States Water Co	United States	[18]	0.50	27%	26%	0.42	Daily
Cia Saneamento Minas Gerais	Latin America	[19]	1.02	51%	34%	0.76	Daily
California Water Service	United States	[20]	0.53	38%	26%	0.41	Daily
Thessaloniki Water and Sewerage Company SA	Europe	[21]	0.37	0%	22%	0.37	Daily
Athens Water Supply & Sewage	Europe	[22]	0.42	0%	22%	0.42	Daily
Middlesex Water Co	United States	[23]	0.60	32%	26%	0.49	Daily
Pennon Group PLC	Europe	[24]	0.83	167%	23%	0.37	Daily
Cia Saneamento Do Parana	Latin America	[25]	0.82	62%	34%	0.58	Daily
SJW Group	United States	[26]	0.42	86%	26%	0.25	Daily
Severn Trent PLC	Europe	[27]	0.62	99%	23%	0.35	Daily
AS Tallinna Vesi	Europe	[28]	0.11	36%	20%	0.09	Daily
United Utilities Group	Europe	[29]	0.62	116%	23%	0.33	Daily
York Water Co	United States	[30]	0.43	30%	26%	0.35	Daily
Median		[31]	0.53	42%	26%	0.37	

Notes:

[A], [B]: Brattle elaboration on Bloomberg data.

[C]: Damodaran, Corporate Marginal Tax Rates - By country, January 2025 Update.

[D]: $[A]/(1+(1-[C])\times[B])$.

[E]: Table 3.

C. Gearing and Asset Beta for the Regulated Activities in the Caribbean Netherlands

59. We calculate the WACC for the three standalone activities using the median asset beta and median gearing of peer groups. Table 5 summarizes the results.

TABLE 5: ASSET BETA AND GEARING FOR REGULATED COMPANIES IN THE CARIBBEAN NETHERLANDS

Sector		Asset Beta [A]	Gearing (D/E) [B]
Electricity production	[1]	0.64	47.61%
Electricity distribution	[2]	0.51	65.65%
Water	[3]	0.37	42.47%

Notes:

[A], [B]: See Table 4.

IV. The Equity Risk Premium

60. In 2022, the ACM determined the equity risk premium (ERP) for the Dutch Caribbean companies by reference to the capital markets in Latin America, the US and Europe, consistent with the assumption that international investors that would invest in the Dutch Caribbean companies would likely to diversify their portfolios in the same region as the Caribbean Netherlands, namely Latin America and the US. Furthermore, because the Caribbean Netherlands are part of the Netherlands, also investors from Europe would potentially invest in the Caribbean Netherlands, so that the European market is also a reference market to determine the WACC for the Caribbean Netherlands.
61. We find the ACM approach reasonable. In principle, if financial markets were perfectly integrated, one would consider a world ERP. However, capital markets are not fully integrated. Investors tend to invest more in countries that are geographically close and with which they are more familiar. Therefore, investors may expect an excess return for their equity investments that is country or region specific. Because of geographic proximity, investors from Latin America and the US would likely invest in the Caribbean Netherlands. Similarly, investors from Europe would also consider investing in a Dutch Caribbean company subject to a regulatory framework they are familiar with. Also, currencies and exchange rates are not relevant issues to consider when calculating the ERP. This is because the ERP is a real measure, calculated by subtracting the nominal risk-free rate from the nominal return to equities.
62. In more detail, the ACM calculated the ERP for the Caribbean Netherlands as the average of the ERP estimated for Latin America, the US and Europe. The ACM estimated the ERP for each region in line with the general ACM method, which considers long-term historical data on the excess return of shares over long-term bonds, using historical data published by Dimson, Marsh and Staunton (DMS). However, because DMS does not report any data about the ERP in Latin America, the ACM considered the ERP estimate reported by Damodaran for this region. With respect to the historical DMS data, the ACM selected the average of the

arithmetic and geometric averages of the realized ERP in the USA and within the Eurozone. We apply the same methodology here.

63. Table 6, below, illustrates the realised ERP published by DMS for individual European countries and for the US taken from the 2025 DMS report, being the latest report available as of the writing of this report.¹⁷ This report contains ERP estimates using data up to and including 2024. For Europe, Table 6 shows the simple and weighted averages of the ERP in Eurozone countries for which DMS have data. Overall, we find that the simple average between the arithmetic and geometric ERP for the period 1900 to 2024 inclusive was 5.84%. Using each country's stock market capitalization to weight the averages across the Eurozone, we derive an ERP of 5.27% for 2024. Taking the average of the arithmetic and geometric means of the realized ERP in the US, we derive an ERP of 5.95%.

TABLE 6: HISTORIC EQUITY RISK PREMIUM RELATIVE TO BONDS (1900 – 2024)

		Risk premiums relative to bonds, 1900 - 2024			Country Market Cap (2024) USD mln [D]
		Geometric mean % [A]	Arithmetic mean % [B]	Average % [C]	
Austria	[1]	3.3	21.2	12.25	142,485
Belgium	[2]	2.60	4.60	3.60	372,061
Finland	[3]	5.50	9.00	7.25	259,757
France	[4]	3.50	5.70	4.60	2,927,979
Germany	[5]	5.20	8.30	6.75	2,400,751
Ireland	[6]	3.00	5.00	4.00	81,690
Italy	[7]	3.30	6.60	4.95	721,221
Netherlands	[8]	3.70	5.90	4.80	959,196
Portugal	[9]	5.20	9.20	7.20	71,896
Spain	[10]	2.00	3.90	2.95	788,853
Average Eurozone	[11]	3.73	7.94	5.84	
Value-weighted average Eurozone	[12]	3.86	6.68	5.27	
United States	[13]	4.90	7.00	5.95	

Notes and sources:

¹⁷ UBS Global Investment Returns Sourcebook 2025, Table 12.

[A][1]-[10], [A][13], [B][1]-[10], [B][13]: Elroy Dimson, Paul Marsh and Mike Staunton, UBS Global Investment Returns Sourcebook 2025, Table 12.

[18]: Average of [1]-[10].

[19]: Average of [1]-[10], weighted by [D].

64. As noted in Section I above, the ERP for Latin America published by Damodaran is calculated relative to the 10-year US government bond rate. However, to ensure consistency between the ERP and risk-free rate, we need to adjust Damodaran's ERP estimate to be consistent with a 20-year bond. In Table 7, below we report Damodaran's estimate of the ERP for Latin America as well as the spot rate on the 10-year US government bond used for its calculation. The Table further reports the contemporaneous spot rate for the 20-year US government bond and the adjusted ERP for Latin America. We find that Damodaran's ERP for Latin America for 2024 adjusted to reflect a bond maturity of 20 years is equal to 8.50%.

TABLE 7: DAMODARAN'S ERP FOR LATIN AMERICA (2024)

ERP - Latin America	[1]	See note	8.78%
US Government Bonds Yield - 10-year	[2]	See note	4.48%
US Government Bonds Yield - 20-year	[3]	See note	4.76%
RFR Adjustment	[4]	[3]-[2]	0.28%
Adjusted ERP - Latin America	[5]	[1]-[4]	8.50%

Notes:

[1]: Damodaran data on ERP, available at <https://pages.stern.nyu.edu/~adamodar/>. 2024

ERP reflects latest estimates available, updated as of 1 July 2024.

[2]-[3]: FRED, Market Yield on US Treasury Securities at 10-Year Constant Maturity [DGS10] and 20-Year Constant Maturity [DGS20]. Yields as of 1 July 2024.

65. By taking the simple average of the ERP for Eurozone, the US and Latin America we derive an ERP of 6.57%.

V. Cost of Debt Methodology

A. Proposed Approach

66. The ACM has informed us that, starting in the next regulatory period, it intends to recalculate the cost of debt annually. This will allow the ACM to apply a WACC that better reflects market conditions throughout the regulatory period and reduce changes to the WACC for the following regulatory period. Accordingly, the ACM has asked us to assess the current cost of debt methodology and provide a recommendation on how to update the cost of debt annually.
67. ACM's current methodology for calculating the cost of debt makes a distinction between existing debt and new debt. With respect to existing debt, the methodology calculates the cost of debt based on the 'staircase model', which assumes that regulated companies finance their existing investment with ten-year loans, and refinance 10% of the debt every year. The methodology for existing debt further distinguishes between past years, for which data are available, and future years for which ACM must forecast the cost of existing debt. For past years, the methodology takes the average daily yield to maturity of comparable debt in any given calendar year. For future years, the methodology takes the average daily yield to maturity of comparable debt over the three years prior to the measurement date.
68. With respect to new debt, the methodology requires to calculate the cost of debt based on the average daily yield to maturity of comparable debt over the three years prior to the measurement date.
69. To update the cost of debt annually, the ACM could in principle maintain the current method and recalculate the cost of debt annually starting from a predetermined set of comparable bonds. In our 2022 report we considered the yields of a set of BBB-rated corporate bonds with a maturity of about ten years issued in the Caribbean region and traded in US dollars. Applying these criteria, we were able to identify 69 bonds. We note, however, that there are

several implementation issues that the ACM would face following this approach. In more detail:

- a. Many of the bonds issued in the Caribbean are issued by local subsidiaries of international companies and financial vehicles that may not necessarily face the same default risk of companies operating in the Caribbean region.
- b. Overtime, there may be changes in the bond ratings that affect the bonds to be considered in the analysis.
- c. Identifying the relevant list of bonds ex ante does not allow to consider the additional bonds that will be issued in the next few years. This may be problematic for updating the cost of debt in 2027 and 2028 because of insufficient bond observations. Effectively, we have identified only 9 and 4 bonds with the relevant maturity for 2027 and 2028, respectively. Also, we are not guaranteed that these bonds will be effectively traded in those years.
- d. Finally, anomalies in the data, attributable for example to missing data or data entry errors for some bonds, typically require a careful and time-consuming check that is incompatible with an annual update.

70. For the reasons above, we recommend the ACM to take an alternative approach and calculate the cost of debt as the sum of the yield of a US 10-year utility index and a predetermined spread over the utility index reflecting the additional cost of issuing debt for a company operating in US dollars in the Caribbean region. The spread can be calculated taking the average spread over the utility index for a set of comparable bonds over the relevant years for the staircase model. The spread would be calculated before the start of the regulatory period and maintained throughout the period.

71. The proposed approach has several advantages relative to the current approach. It is simpler, more transparent and predictable, as the ACM would only need to calculate annually the yield on the utility index. Similar to the current approach, the revised approach would adequately reflect the cost of US dollar debt of companies operating in the Caribbean. Importantly, it would allow the ACM to easily update the cost of debt annually to reflect current market conditions. In the following section we identify the US BBB 10-year utility index the ACM could use in the annual update of the cost of debt calculation and calculate the applicable level of

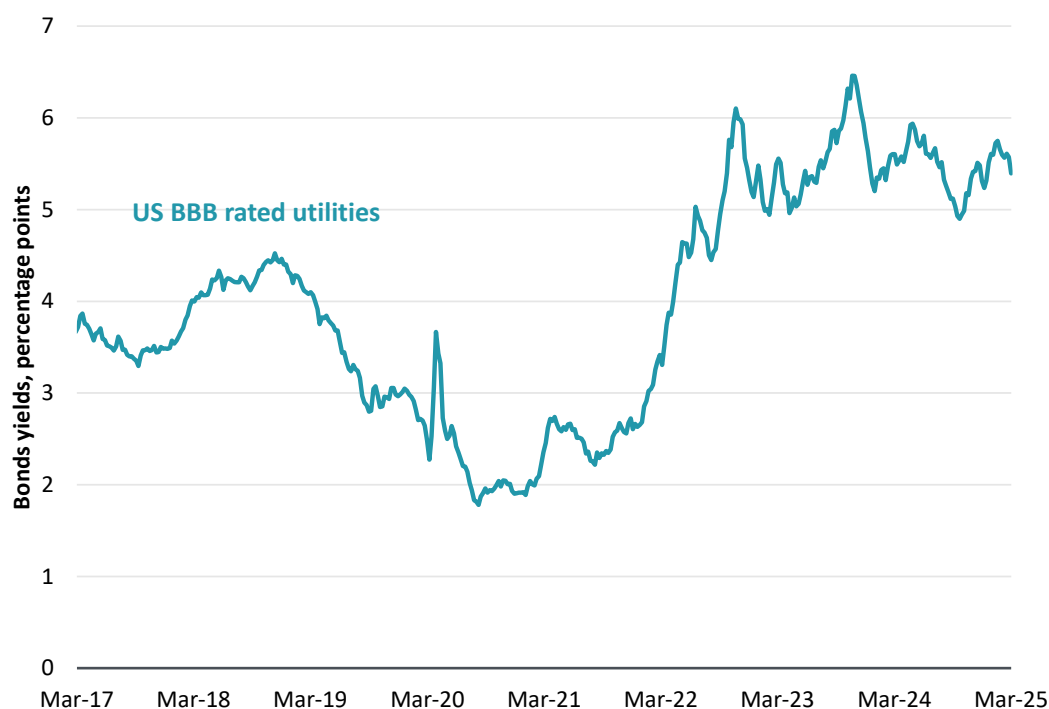
the spread based on the yields for a set of comparable BBB-rated bonds issued in the Caribbean region.

B. Yield on the US Utility Index and Spread on the Comparable Bonds

72. Because the Dutch Caribbean Companies operate in US dollars, we must consider an index traded in US dollars. Also, because we are estimating the cost of BBB-rated debt, we must select a BBB-rated index. We have thus selected the US BBB 10-year utility index (the IGUUUB10 BVLI Index) published daily by Bloomberg considering bonds issued by US utilities with a of rating of BBB+, BBB or BBB-.¹⁸
73. Figure 2, below, shows the evolution of the yield of the utility index between March 2017 and February 2025, being the past years that the ACM would consider in applying the staircase method.

¹⁸ We note that this index belongs to Bloomberg's BVLI class of indices. In past reports for the ACM, we have used instead indices in the BFV class – such as for example the BFV EUR Utility (A) 10 Year Index in the Brattle report for the Dutch Energy Networks. However, Bloomberg has discontinued the BFV class and replaced it with the BVLI class.

FIGURE 2: US BBB RATED UTILITIES 10-YEAR BONDS YIELDS¹⁹



74. To calculate the spread, we must first identify a set of comparable bonds reflecting the additional cost of issuing debt for a company operating in US dollars in the Caribbean region. We apply the same methodology we applied in our 2022 report and identify a set of BBB-rated corporate bonds with a maturity of about ten years issued in the Caribbean region and traded in US dollars. We only consider bonds with a remaining maturity of between 9 to 13 years at any point in time during the relevant measurement period, being March 2017 through February 2025. This exercise results in a list of 76 bonds.
75. To identify whether the bonds were issued by companies operating in the Caribbean region or local subsidiaries of international companies and financial vehicles, we check the company descriptions and the bond descriptions in the Bloomberg and CapIQ databases. We find that only 20 out of the 76 bonds were issued by companies operating in the Caribbean. We provide

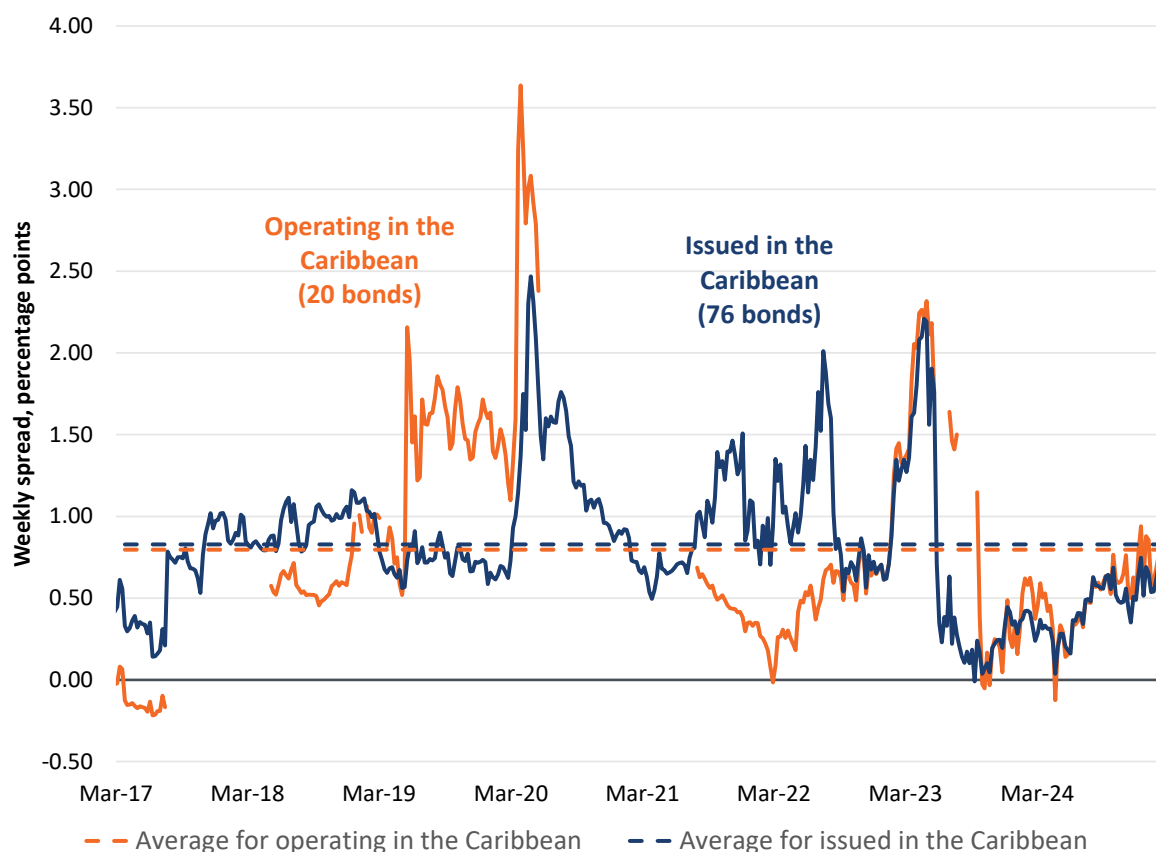
¹⁹ We use Bloomberg's IGUUUB10 BVLI Index to obtain the 10-year bonds yields of USD denominated senior unsecured fixed rate bonds issued by US utilities companies with a BBG composite rating of BBB+, BBB and BBB-.

the full list of bonds, including the indication whether the individual bond was issued by a company operating in the Caribbean, in Appendix A.

76. Clearly, the list of bonds issued by companies operating in the Caribbean most directly relevant to calculation the cost of debt for the networks operating in the Caribbean Netherlands. However, the sample is potentially too small to reliably calculate a spread over a long measurement period. This is because at any point in time during the measurement period we only consider the subset of bonds with a 9 to 13 years maturity, so that for some periods we could have no yields.
77. We could expand the sample by using yields of bonds issued in the Caribbean from companies that do not operate there. These companies face different risks than companies operating in the Caribbean. However, to the extent that the spread is driven by the liquidity characteristics of bonds issued in the Caribbean rather than operational risks of the region, then bonds issued in the Caribbean with a similar rating and traded in the same currency could still be relevant to calculating the spread.
78. To analyse this issue in more detail, we have compared the evolution of the spread between the broader group of bonds issued in the Caribbean and the smaller set of bonds issued by companies operating in the Caribbean.
79. Figure 3, below, shows the evolution of the spread over the US utility index for both the group of 76 bonds issued in the Caribbean (blue line) and the smaller set of 20 bonds issued by companies operating in the Caribbean (orange line). The figure further shows the average spread for the two groups. Our findings are broadly consistent with our expectations:
 - a. Overall, the two groups of bonds exhibit a very similar spread, with an average spread that is very close between the two series (0.80% and 0.83%).
 - b. There are two periods of misalignment between May 2019 and February 2020 and between August 2021 and August 2022. These misalignments, however, seem to be related to the relatively small sample of companies operating in the Caribbean and driven by individual bonds dropping out or being added to the sample. Strikingly, the two series are very close since October 2023, a period in which there were on average 3.3 bonds issued by companies operating in the Caribbean in each week (compared to an average number below 1 in the preceding period).

- c. The spread for bonds issued by companies operating in the Caribbean appears more volatile and there are some gaps in the series for periods in which no bonds were available in the relevant maturity range.

FIGURE 3: WEEKLY SPREAD OVER THE US UTILITIES INDEX



80. Table 8, below, further compares the annual spread for the two groups of bonds in each year of the measurement period. The table further includes the average for the overall period. By looking at the evolution of the annual spreads over time, we observe that there is some degree of variability in the spreads overtime, with a peak during the Covid period and at the beginning of 2023.

TABLE 8: SPREAD FOR THE SAMPLE OF BONDS OPERATING AND ISSUED IN THE CARIBBEAN

	Operating in the Caribbean (20 bonds) p.p. [A]	Issued in the Caribbean (76 bonds) p.p. [B]
Average 2017/2025	0.80	0.83

2017/2018	-0.13	0.64
2018/2019	0.65	0.96
2019/2020	1.42	0.71
2020/2021	2.73	1.27
2021/2022	0.41	0.92
2022/2023	0.62	1.03
2023/2024	0.95	0.62
2024/2025	0.54	0.47

81. In principle, if we were estimating a notional cost of debt, we would recommend using a short-term average. However, because for existing debt the ACM uses the staircase model, whereas the cost of debt for 2026 is calculated considering the average yield starting from 2017, we find it reasonable to set the spread equal to the 8-year average over the period March 2017-February 2025. Accordingly, we recommend the ACM to consider a value of the spread of 0.80%, equal to the average spread for bonds issued by companies operating in the Caribbean.
82. For new debt, in theory the latest spreads are likely to be more relevant to the expected future spread. If the spread is not mean reverting, then using older spreads may include out-of-date data that is not relevant to a forecast of future spreads. However, we also note that, based on the data in Figure 3 above, spreads seem to be quite volatile. Hence, there is a risk that using a recent spread based on a short period could result in an anomalous value of the spread. Given the volatility of the spread data, we consider that the most robust approach is for the ACM to consider the same spread of 0.80% to calculate the cost of new debt as it applies to the existing debt.

Appendix A. List of Bonds

TABLE 9: LIST OF BONDS

Company		Ticker [A]	Maturity date [B]	Currency [C]	Rating [D]	Operating in Caribbean [E]
Vale Overseas Ltd	[1]	EF8618557 Corp	21/11/2036	USD	BBB-	
Vale Overseas Ltd	[2]	ED2864079 Corp	17/01/2034	USD	BBB-	
China Cinda Finance 2017 I Ltd	[3]	AR0491142 Corp	08/02/2028	USD	BBB+	
Nan Fung Treasury Ltd	[4]	ZO0965715 Corp	27/08/2030	USD	BBB-	
CFAMC II Co Ltd	[5]	LW2396007 Corp	03/06/2026	USD	BBB-	
Gerdau Trade Inc	[6]	AP5642594 Corp	24/10/2027	USD	BBB	
Emaar Sukuk Ltd	[7]	BQ3198190 Corp	06/07/2031	USD	BBB	
Emaar Sukuk Ltd	[8]	ZR5449254 Corp	17/09/2029	USD	BBB	
Nan Fung Treasury Ltd	[9]	AU2697798 Corp	05/09/2028	USD	BBB-	
HKT Capital No 4 Ltd	[10]	LW7947036 Corp	14/07/2026	USD	BBB	✓
China Resources Land Ltd	[11]	AX3066401 Corp	26/02/2029	USD	BBB+	
MAF Sukuk Ltd	[12]	ZK7502980 Corp	01/06/2033	USD	BBB	
EDO Sukuk Ltd	[13]	ZI8420963 Corp	21/09/2033	USD	BBB-	✓
CMHI Finance BVI Co Ltd	[14]	AT8075117 Corp	06/08/2028	USD	BBB+	
Emaar Sukuk Ltd	[15]	LW3641039 Corp	15/09/2026	USD	BBB	
MAF Sukuk Ltd	[16]	ZQ2590680 Corp	28/02/2030	USD	BBB	
MAF Sukuk Ltd	[17]	ZS5181574 Corp	14/05/2029	USD	BBB	
CFAMC II Co Ltd	[18]	AL2762667 Corp	22/11/2026	USD	BBB-	
National Gas Co of Trinidad & Tobago Ltd	[19]	EF2484378 Corp	15/01/2036	USD	BBB-	✓
HKT Capital No 5 Ltd	[20]	ZR7659678 Corp	30/09/2029	USD	BBB	
Nan Fung Treasury Ltd	[21]	AP2853343 Corp	03/10/2027	USD	BBB-	
China Cinda Finance 2017 I Ltd	[22]	AX2375126 Corp	21/02/2029	USD	BBB+	
China Cinda Finance 2017 I Ltd	[23]	AM6439740 Corp	09/03/2027	USD	BBB+	
Joy Treasure Assets Holdings Inc	[24]	AX6786625 Corp	20/03/2029	USD	BBB	
Barrick International Barbados Corp	[25]	EF7505086 Corp	15/10/2036	USD	BBB+	✓
Gerdau Trade Inc	[26]	AP5646330 Corp	24/10/2027	USD	BBB	
EDO Sukuk Ltd	[27]	ZI8420955 Corp	21/09/2033	USD	BBB-	✓
Barrick International Barbados Corp	[28]	EF7505169 Corp	15/10/2036	USD	BBB+	✓
National Gas Co of Trinidad & Tobago Ltd	[29]	EF2484337 Corp	15/01/2036	USD	BBB-	✓
Bonds Finance Co Ltd	[30]	AP2529125 Corp	20/01/2037	USD	BBB	

Vale Overseas Ltd	[31]	ZK9228261 Corp	12/06/2033	USD	BBB-	
RenaissanceRe Holdings Ltd	[32]	YR6435683 Corp	01/04/2035	USD	BBB+	
Vale Overseas Ltd	[33]	BK4047837 Corp	08/07/2030	USD	BBB-	
Meituan	[34]	BM0568766 Corp	28/10/2030	USD	BBB+	
Weibo Corp	[35]	BK3037409 Corp	08/07/2030	USD	BBB	
RenaissanceRe Holdings Ltd	[36]	ZK8510636 Corp	05/06/2033	USD	BBB+	
Sands China Ltd	[37]	AW3717286 Corp	08/08/2028	USD	BBB-	
Gold Fields Orogen Holdings BVI Ltd	[38]	ZS5391108 Corp	15/05/2029	USD	BBB-	✓
Sands China Ltd	[39]	BN2376299 Corp	18/06/2030	USD	BBB-	
Poinsettia Finance Ltd	[40]	LW4208697 Corp	17/06/2031	USD	BBB	
Sands China Ltd	[41]	BX7319607 Corp	08/08/2031	USD	BBB-	
China Cinda 2020 I Management Ltd	[42]	BN4783278 Corp	20/01/2031	USD	BBB+	
Joy Treasure Assets Holdings Inc	[43]	BM3419421 Corp	17/11/2030	USD	BBB	
HKT Capital No 6 Ltd	[44]	BT4505314 Corp	18/01/2032	USD	BBB	✓
InterCorp Peru Ltd	[45]	AZ7913496 Corp	15/08/2029	USD	BBB-	
Ascot Group Ltd	[46]	BN0032357 Corp	15/12/2030	USD	BBB-	
Autopistas Metropolitanas de Puerto Rico LLC	[47]	EJ7807765 Corp	30/06/2035	USD	BBB	✓
Enstar Group Ltd	[48]	BR0773753 Corp	01/09/2031	USD	BBB	
Enstar Group Ltd	[49]	ZS8125016 Corp	01/06/2029	USD	BBB+	
Sands China Ltd	[50]	AT8716553 Corp	08/08/2028	USD	BBB-	
Triton Container International Ltd / TAL International Container Corp	[51]	BT4697715 Corp	15/03/2032	USD	BBB	✓
Bank of NT Butterfield & Son Ltd/The	[52]	BJ8835727 Corp	15/06/2030	USD	BBB	
Joy Treasure Assets Holdings Inc	[53]	ZR6543899 Corp	24/09/2029	USD	BBB	
Bacardi Ltd	[54]	AS3750997 Corp	15/05/2028	USD	BBB-	✓
Sands China Ltd	[55]	BJ8134303 Corp	18/06/2030	USD	BBB-	
Bacardi Ltd	[56]	LW8056910 Corp	15/07/2026	USD	BBB-	✓
Goodman HK Finance	[57]	BK5362433 Corp	22/07/2030	USD	BBB+	
ENN Energy Holdings Ltd	[58]	ZO4254744 Corp	17/09/2030	USD	BBB+	
Fidelis Insurance Holdings Ltd	[59]	BJ9881399 Corp	30/06/2030	USD	BBB-	
Sands China Ltd	[60]	BR3754040 Corp	08/08/2031	USD	BBB-	
Triton Container International Ltd	[61]	BP8032602 Corp	15/06/2031	USD	BBB	✓
Poinsettia Finance Ltd	[62]	LW4193444 Corp	17/06/2031	USD	BBB	
Triton Container International Ltd	[63]	BP8032610 Corp	15/06/2031	USD	BBB	✓
Ascot Group Ltd	[64]	BN0032373 Corp	15/12/2030	USD	BBB-	

Marvell Technology Group Ltd	[65]	AT2281232 Corp	22/06/2028	USD	BBB-	✓
Bacardi Ltd	[66]	AS3752332 Corp	15/05/2028	USD	BBB-	✓
Gold Fields Orogen Holdings BVI Ltd	[67]	ZS5391090 Corp	15/05/2029	USD	BBB-	✓
Meituan	[68]	BM0542910 Corp	28/10/2030	USD	BBB+	
Bacardi Ltd	[69]	LW8107382 Corp	15/07/2026	USD	BBB-	✓
ENN Energy Holdings Ltd	[70]	ZO4254736 Corp	17/09/2030	USD	BBB+	
Sands China Ltd	[71]	BR3754024 Corp	08/08/2031	USD	BBB-	
Autopistas Metropolitanas de Puerto Rico LLC	[72]	EJ7808110 Corp	30/06/2035	USD	BBB	✓
Intercorp Peru Ltd	[73]	AZ7913488 Corp	15/08/2029	USD	BBB-	
Fidelis Insurance Holdings Ltd	[74]	BK0212765 Corp	30/06/2030	USD	BBB-	
Sands China Ltd	[75]	BJ8134428 Corp	18/06/2030	USD	BBB-	
Sands China Ltd	[76]	AT8716595 Corp	08/08/2028	USD	BBB-	
