The WACC for Drinking Water Companies in the Netherlands

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I. Introduction and Summary

1. The Dutch Authority for Consumers and Markets (ACM) has commissioned The Brattle Group (Brattle) to calculate the Weighted Average Cost of Capital (WACC) for drinking water distribution companies in the Netherlands for the next regulatory period 2025-2027.[1]
2. The ACM has instructed us to calculate the WACC using ACM's general methodology and the relevant prescriptions of the applicable legislation for the drinking water sector, which are currently under review.[2] More specifically, the ACM has asked us to estimate two WACCs:
   a. A WACC based on the current methodology; and
   b. A WACC reflecting the proposed amendments to the applicable legislation, which introduce a number of methodological changes to the calculation of the risk-free rate (RFR) and of the cost of debt.
3. In calculating the WACC, the ACM has further asked us to evaluate:
   a. whether expected developments and required investments in the drinking water sector will affect the risk profile of the Dutch drinking water companies, and
   b. a reasonable level of gearing (D/A) for the Dutch drinking water companies, consistent with a single-A credit rating.
4. In preparing this report, we use data up to and including 31 May 2024 (measurement date), being the most recent data available at the time of our analysis.

A. Risk-Free Rate

5. ACM's current methodology for the drinking water sector specifies that the RFR for the cost of equity is based on the two-year and five-year average yield on 10-year Dutch government

[1] ACM also commissioned Brattle to estimate the WACC for drinking water distribution companies in the Netherlands in 2013, 2015, 2017, 2019 and 2021. See, respectively, Dan Harris and Renato Pizzolla, "The WACC for Dutch Drink Water Companies", 28 June 2013 ("Brattle 2013 Report"); Dan Harris, Richard Caldwell, and Ying-Chin Chou, "The WACC for Dutch Drink Water Companies", 3 July 2015 ("Brattle 2015 Report"); Dan Harris, Lucia Bazzucchi, and Flora Triolo, "Update to WACC Parameters for Drinking Water", 28 July 2017 ("Brattle 2017 Report"); Dan Harris, Lucrezio Figurelli, Flora Triolo and Massimiliano Cologgi "The WACC for Drinking Water Companies in the Netherlands", 9 July 2019 ("Brattle 2019 Report"); and Dan Harris, Lucrezio Figurelli, Federico Guatri, Filippo Nezzo "The WACC for Drinking Water Companies in the Netherlands", 9 August 2021 ("Brattle 2021 Report").

[2] The WACC methodology for the drinking water sector is governed by ACM general methodology and the prescriptions of the 'Drinkwaterbesluit' and the 'Drinkwaterregeling'.

bonds, whereas the RFR for the cost of debt is set based on the ten-year average yield on 10-year Dutch government bonds.

6. The ACM has informed us that the Ministry of Infrastructure and Water Management plans to amend the methodology to calculate a separate RFR both for the cost of equity and for the cost of debt. Specifically:
   a. The RFR for the cost of equity will be set based on the two-year and five-year average yield on Dutch government bonds with a maturity of 20 years instead of 10.
   b. The RFR for the cost of debt will be set based on the average yield on 10-year Dutch government bonds over three years instead of 10.
7. The two-year, five-year, and ten-year averages of the 10-year Dutch government bond yields were equal to 2.54%, 0.94%, and 0.75%, respectively. The corresponding two-year and five-year averages of the 20-year Dutch government bond yields were equal to 2.65% and 1.14%, respectively. Finally, the three-year average of the 10-year Dutch government bond yields was equal to 1.76%.
   a. **Under the current methodology**, we use the average between the two-year and five-year average yield, equal to 1.74%, as a measure of the RFR for the cost of equity, while we use the ten-year average yield, equal to 0.75%, as a measure of the RFR for the cost of debt.
   b. **Under the amended methodology**, we use the average between the two-year and five-year average yield on 20-year government bonds, equal to 1.89%, as a measure of the RFR for the cost of equity, while we use the three-year average yield on 10-year government bonds, equal to 1.76%, as a measure of the RFR for the cost of debt.

B. Equity Risk Premium

8. We calculate the Equity Risk Premium (ERP) using long-term historical data on the excess return of shares over long-term bonds, using data from European markets. Specifically, the methodology requires that the projected ERP should be based on the average of the arithmetic and geometric realized ERP for the Eurozone, using the market capitalization of each country's stock market as weights. The methodology also requires considering whether adjustments to the final ERP need to be made based on considerations of the historical average ERP, and ERP estimates based on dividend-growth models.
9. We find that the average DMS ERP for the Eurozone slightly declined from 4.95% in 2019 to 4.85% in 2020 and steadily increased thereafter to 5.06% in 2021, 5.20% in 2022 and to 5.23% in 2023. The recent increase in the historical ERP largely reflects the combined effect of a higher market volatility and a higher inflation rate. On the other hand, the evidence from the DGMs is highly mixed, with the KPMG and Bloomberg DMS estimates going in opposite directions.

10. Based on the available evidence, we conclude that the ERP should be increased relative to the 5.0% value selected in 2021, to reflect the continuing uncertainties of the economic environment. On balance, we find that a value of the ERP of 5.1% would adequately reflect the expected return of equity investors over the next regulatory period. We thus apply this value in our calculation of the 2025-2027 WACC.

C. Beta

11. The Dutch drinking water companies for which we are estimating the WACC are not publicly traded. Therefore, we have selected a 'peer group' of publicly traded water distribution companies, as well as regulated energy network firms that have similar systematic risk to a regulated water distribution company. We use the peer group of companies to estimate the beta and gearing for water distribution. We have tested that the shares of the peer group firms are sufficiently liquid to provide a reliable beta estimate.
12. The methodology specifies a three-year daily sampling period for the betas. We estimate that the asset beta for water distribution in the Netherlands is 0.36. This compares to an asset beta of 0.39 in our 2021 report.
13. As we explain in this report, a very high level of investment over the next regulatory period may warrant an increase in the beta we apply when estimating the cost of capital for the Dutch drinking water companies. In line with our 2021 report, we have analysed the historical and expected evolution of the Dutch drinking water companies' capital expenditure and RAB, to determine if an adjustment to the beta of the Dutch drinking water companies is warranted. A beta uplift is only warranted in case of an extraordinary increase in the RAB. We estimate that over the period 2024-2028, the RAB of the Dutch Drinking water companies is expected to increase by an average rate of 7.9% a year. This compares to an average rate of 4.9% a year over the period 2020-2024. We conclude that although planned investments of the Dutch drinking water companies are expected to increase, the magnitude of the increase is not large. Accordingly, the speed at which the RAB of the Dutch drinking water companies is expected to grow does not warrant an uplift to the beta.

D. Gearing

14. The ACM has asked us to evaluate a reasonable level of gearing (D/A) for the Dutch drinking water companies, also assessing whether this level is consistent with a single-A rating.
15. In line with the ACM general WACC methodology, and with the prescriptions of the applicable legislation, we calculate the gearing of the Dutch drinking water companies by reference to the median gearing of a group of European water distribution firms and European energy

networks, bearing in mind the constraint to have at least 30% debt financing.[3] Overall, we find that the median gearing – defined as the ratio of debt to total asset value or D/A – for this group is equal to 45.47%, which is broadly slightly lower than the 47.15% gearing we used in our 2021 report.

16. To evaluate whether a 45.47% gearing is consistent with a single-A credit rating, we analyse the Dutch water companies' gearing and likely credit rating.

17. We calculate that the average actual gearing of the Dutch water companies in 2023 is equal to 60.4%, and that with this gearing, a representative Dutch drinking water company would likely get a credit rating of A+. Hence, a Dutch water company with the average European gearing of 45.47% would qualify for a single-A rating.

E. Cost of Debt and Debt Premium

18. ACM's methodology specifies that the allowed cost of debt is set equal to the sum of the RFR for the cost of debt, an average interest spread over the RFR or debt premium, and a 15 basis points allowance to cover the costs of issuing debt.

19. The current methodology specifies that the debt premium is in turn based on the cost of debt for a group of bonds issued by firms engaged in similar activities to drinking water distribution companies that have a rating of or close to A (the 'comparable bonds'). We understand that 'similar activities' in this context includes, in addition to water distribution companies, transport and/or distribution of gas and electricity. We have identified a group of comparable bonds that fit these criteria.

20. To make the calculation consistent with the calculation of the RFR under both the current and amended methodologies, we consider the ten-year average spread under the current methodology and the three-year average spread under the amended methodology.

    a. **Under the current methodology**, we estimate a debt premium of 1.12%, resulting in a pre-tax cost of debt of 2.03%, when we add a RFR of 0.75% and a 15-basis points allowance to account for the cost of issuing debt.

    b. **Under the amended methodology**, we estimate a debt premium of 1.29%, resulting in a pre-tax cost of debt of 3.20%, when we add a RFR of 1.76% and a 15-basis points allowance to account for the cost of issuing debt.

[3] According to the decree on the permitted share of equity capital for 2020 and 2021, the maximum permitted share of equity capital of a drinking water company is set at 70%, which implies a minimum share of debt of 30%. See "Besluit vaststelling maximaal toegestane aandeel eigen vermogen, ex artikel 10, tweede lid, Drinkwaterwet, voor 2020 en 2021", available at: https://wetten.overheid.nl/BWBR0042716/2019-11-02.

F. WACC of the Dutch Drinking Water Companies

21. Table 1 summarizes the WACC for drinking water distribution and the inputs to the WACC calculation under the current and amended methodologies.

TABLE 1: WACC 2025-2027

			Current Method	Amended Method
Gearing (D/A)	[1]	Section VI	45.47%	45.47%
Gearing (D/E)	[2]	[1]/(1-[1])	83.37%	83.37%
Tax rate	[3]	Assumed	0.00%	0.00%
Risk free rate - Equity	[4]	Section II	1.74%	1.89%
Asset beta	[5]	Section V	0.36	0.36
Equity beta	[6]	[5]x(1+(1-[3])x[2])	0.66	0.66
Equity Risk Premium	[7]	Section III	5.10%	5.10%
After-tax cost of equity	[8]	[4]+[6]x[7]	5.11%	5.26%
Risk free rate - Debt	[9]	Section II	0.75%	1.76%
Debt premium	[10]	Section VII	1.12%	1.29%
Non-interest fees	[11]	Assumed	0.15%	0.15%
Pre-tax cost of debt	[12]	[9]+[10]+[11]	2.03%	3.20%
Nominal after-tax WACC	[13]	((1-[1])x[8])+([1]x(1-[3])x[12])	3.71%	4.32%
Nominal pre-tax WACC	[14]	[13]/(1-[3])	3.71%	4.32%

II. The Risk-Free Rate

22. ACM's current methodology for the drinking water sector specifies that a different RFR is used in the calculation of the cost of equity and the cost of debt. The RFR for the cost of equity is based on the 2-year and 5-year average yield on 10-year Dutch government bonds, whereas the RFR for the cost of debt is set based on the 10-year average yield on 10-year Dutch government bonds.

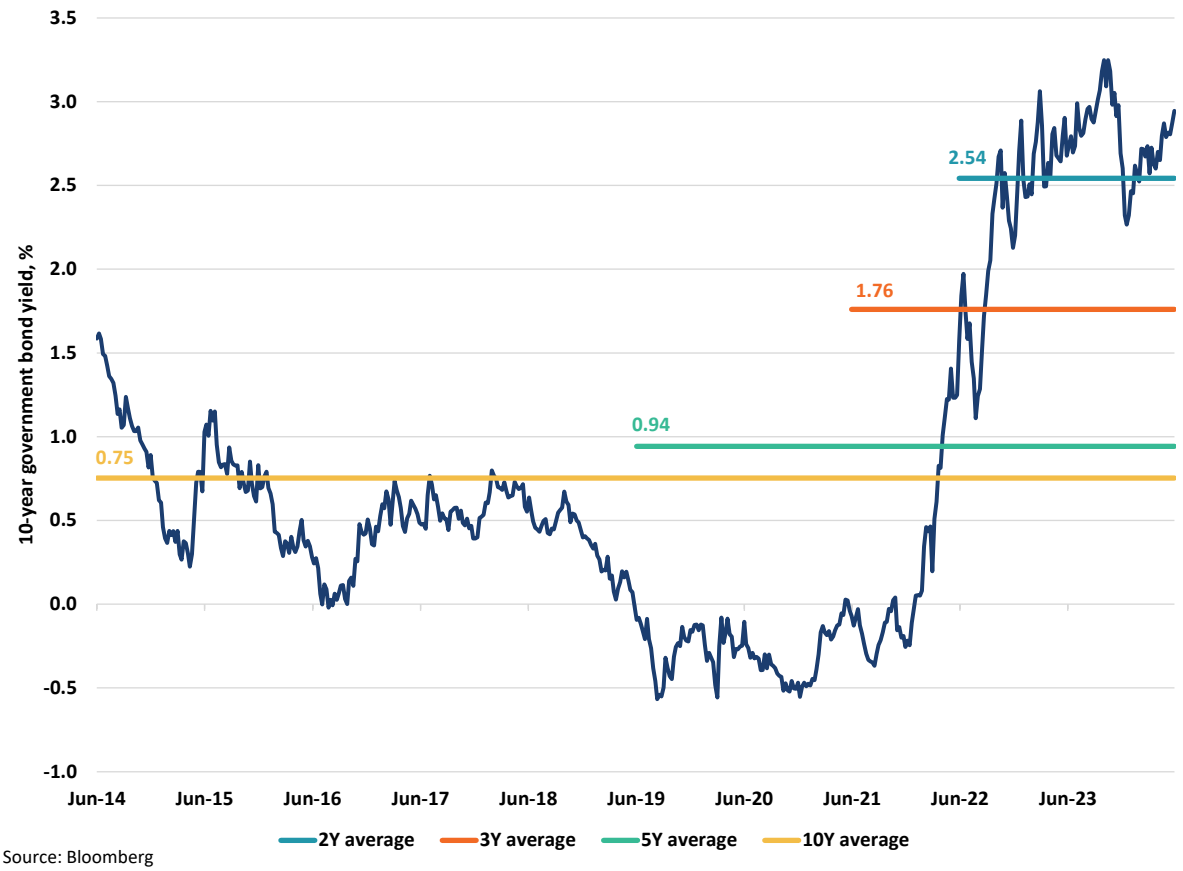
23. The ACM has informed us that the Ministry of Infrastructure and Water Management plans to amend the methodology to calculate a separate RFR both for the cost of equity and for the cost of debt. Specifically:

a. The RFR for the cost of equity will be set based on the two-year and five-year average yield on Dutch government bonds with a maturity of 20 years instead of 10.

b. The RFR for the cost of debt will be set based on the average yield on 10-year Dutch government bonds over three years instead of 10.

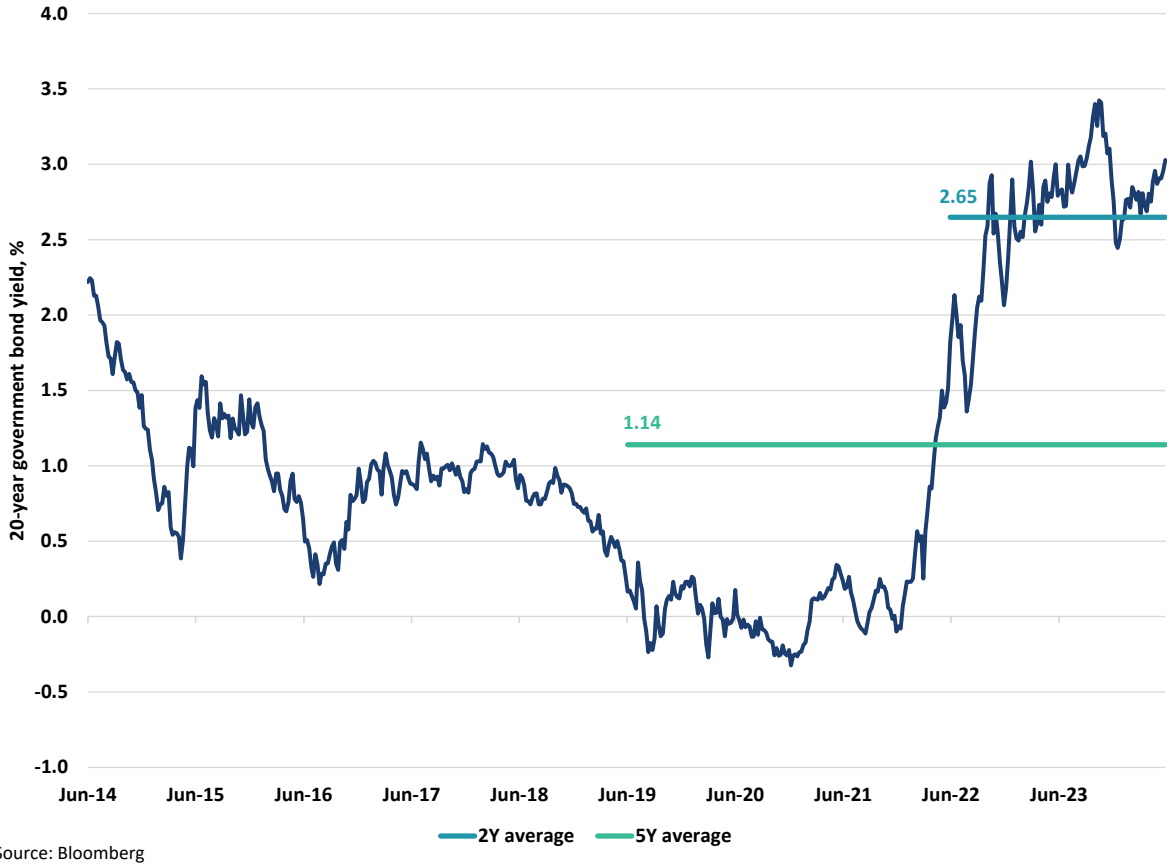
24. Figure 1 and Figure 2 below illustrate the yields on the 10-year and 20-year Dutch government bonds, respectively. Over the past 10 years, Dutch government bond yields have been steadily decreasing through 2019. After that, bond yields fluctuated around zero through the end of 2021, when they started to increase, largely driven by higher energy prices and, relatedly, an exceptionally high rate of inflation. The increase in Dutch government bond yields accelerated in 2022 due to the ECB announcements that it would end its monetary policy of Quantitative Easing and raise interest rates for the first time since 2011. Yields continued to grow in 2023 due to the increase of interest rates by the ECB, reaching highs above 3.3% in March 2023. Yields then fell sharply to lows below 2.5% in December 2023. After that, yields have increased again to about 3% by May 2023. The 10-year and 20-year Dutch government bonds follow a very similar pattern, with the 20-year bonds demanding a slightly higher yield.

FIGURE 1: YIELD ON DUTCH GOVERNMENT 10-YEAR BONDS



Source: Bloomberg

FIGURE 2: YIELD ON DUTCH GOVERNMENT 20-YEAR BONDS



Source: Bloomberg

25. As shown in Figure 1, the two-year, three-year, five-year, and ten-year averages of the 10-year Dutch government bond yields were, respectively, equal to 2.54%, 1.76%, 0.94%, and 0.75%. Figure 2 instead reports yields on 20-year Dutch government bonds. The two-year and five-year averages are 2.65% and 1.14% respectively.

    a. **Under the current methodology**, we use the average between the two-year and five-year average yield on 10-year government bonds, equal to 1.74%, as a measure of the RFR for the cost of equity, and the ten-year average yield, equal to 0.75%, as a measure of the RFR for the cost of debt.

    b. **Under the amended methodology**, we use the average between the two-year and five-year average yield on 20-year government bonds, equal to 1.89%, as a measure of the RFR for the cost of equity, while we use the three-year average yield on 10-year government bonds, equal to 1.76%, as a measure of the RFR for the cost of debt.

III. The Equity Risk Premium

26. ACM's methodology specifies that the ERP should be based on a historical time-series of the excess return of stocks over long-term bonds for the Eurozone economies. Specifically, ACM

has determined to use the simple average of the long-term arithmetic and geometric ERP for the Eurozone as the anchor for the ERP estimate. The ERP for individual countries in the Eurozone should be weighted using the current capitalization of each country's stock market.[4] The methodology reflects an estimate of the ERP in the very long run, and notably excludes countries outside of the Eurozone. This is reasonable, because a Dutch investor is more likely to be diversified over the same currency zone, rather than to incur additional currency risks by diversifying within Europe but outside of the Eurozone.

27. Table 2, below, illustrates the realised ERP derived from one of the most widely used sources for long-run excess returns, being the data published by Dimson, Marsh and Staunton (DMS) for individual European countries taken from the 2024 DMS report.[5] This report contains ERP estimates using data up to and including 2023. The table shows the simple and weighted averages of the ERP for the Eurozone countries for which DMS have data. We find that the simple average between the arithmetic and geometric ERP for the period 1900 to 2023 inclusive was 5.81% for the Eurozone. Using each country's stock market capitalization to weight the averages across the Eurozone, we derive an ERP of 5.23%.[6] This value compares to a weighted average for the Eurozone of 4.85% in 2020.[7]

[4] Weighting based on the current market-capitalization reflects the idea that a typical investor would invest a larger share of his portfolio in countries with more investment opportunities.

[5] Credit Suisse Global Investment Returns Sourcebook 2024, Table 11.

[6] Note that in calculating the Eurozone averages, at the request of ACM, we include Austria, for which DMS reports a value of the arithmetic mean of 21.0%. Excluding Austria would reduce the value of the weighted Eurozone average of the arithmetic mean from 6.65% to 6.40%, and the average between the values of the weighted arithmetic and geometric means from 5.23% to 5.11%.

[7] See Brattle 2021 Report, p. 7.

TABLE 2: HISTORIC EQUITY RISK PREMIUM RELATIVE TO BONDS (1900 – 2023)

		Risk premiums relative to bonds, 1900 - 2023			
		Geometric mean	Arithmetic mean	Average	Country Market Cap (2023)
		%	%	%	USD mln
		[A]	[B]	[C]	[D]
Austria	[1]	3.20	21.00	12.10	154,966
Belgium	[2]	2.50	4.60	3.55	397,221
Denmark	[3]	3.90	5.60	4.75	841,493
Finland	[4]	5.50	9.10	7.30	297,651
France	[5]	3.50	5.70	4.60	3,272,278
Germany	[6]	5.10	8.20	6.65	2,411,223
Ireland	[7]	3.00	4.90	3.95	86,922
Italy	[8]	3.30	6.60	4.95	690,769
Norway	[9]	2.90	5.60	4.25	399,402
Netherlands	[10]	3.60	5.90	4.75	993,365
Portugal	[11]	5.40	9.40	7.40	93,000
Spain	[12]	1.90	3.80	2.85	749,302
Sweden	[13]	3.50	5.70	4.60	1,043,914
Switzerland	[14]	2.30	3.80	3.05	2,103,759
United Kingdom	[15]	3.80	5.20	4.50	3,089,904
Europe	[16]	3.30	4.50	3.90	
World	[17]	3.30	4.50	3.90	
Average Eurozone	[18]	3.70	7.92	5.81	
Value-weighted average Eurozone	[19]	3.82	6.65	5.23	

Notes and sources:

[A][1]-[17], [B][1]-[17]: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2024, Table 11.

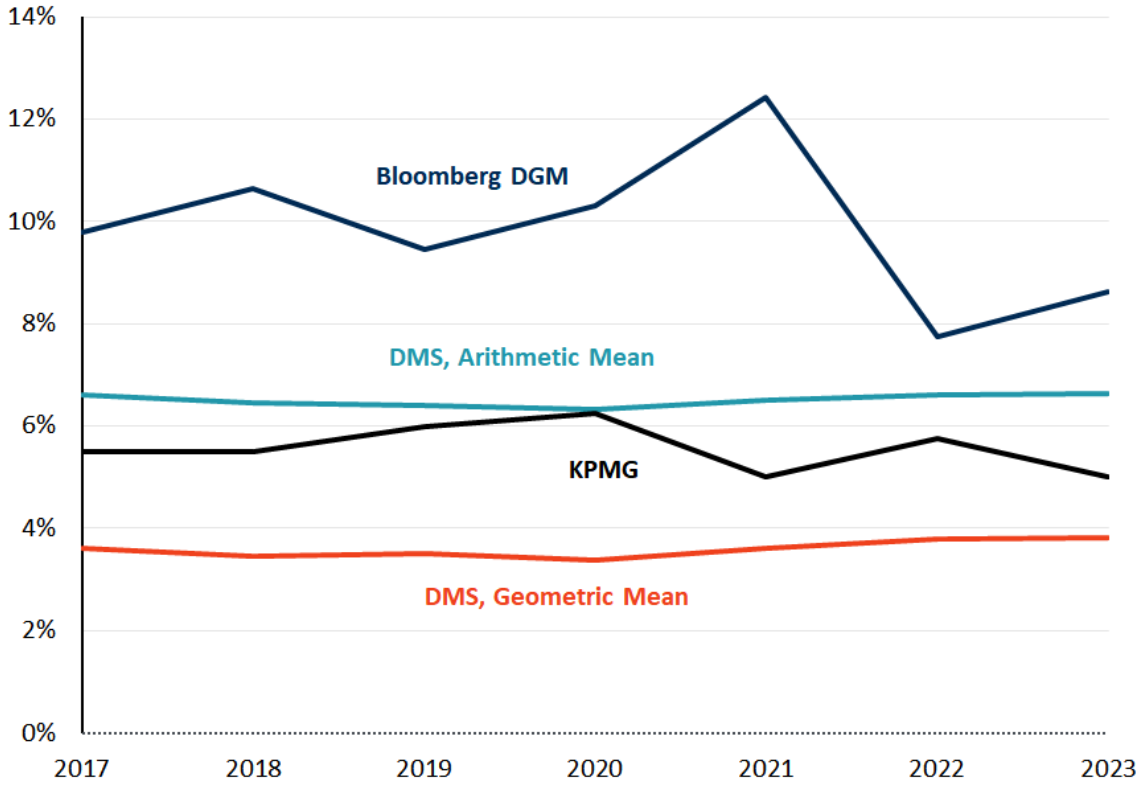
[18]: Average [1], [2], [4], [5], [6], [7], [8], [10], [11], [12].

[19]: Average [1], [2], [4], [5], [6], [7], [8], [10], [11], [12], weighted by [D].

28. There has clearly been a significant increase in the ERP measured by DMS in the last three years. The question is whether the measured increase represents an increase in the actual ERP. To inform this question, ACM's methodology considers whether an adjustment to an ERP estimate based on historical data is warranted, based on evidence from models such as the dividend growth model (DGM) that are based on dividend forecasts. In Figure 3, below, we compare the DMS estimates of the arithmetic and geometric means of the historical ERP for

the Eurozone to the forward-looking estimates of the ERP based on Bloomberg's and KPMG's DGMs.[8]

FIGURE 3: EUROZONE EQUITY RISK PREMIUMS BY YEAR



29. As shown in Figure 3, evidence from the DGMs is mixed, particularly over the last few years. We observe that KPMG's estimate of the ERP decreased from 2020 to 2021, increased from 2021 to 2022 and increased from 2022 to 2023. Bloomberg's DGM estimate, on the other hand, increased from 2020 to 2021, decreased from 2021 to 2022 and increased from 2022 to 2023. Instead, the arithmetic and geometric means based on the historical DMS data steadily increased over the period 2020-2023. Table 3, which reports the average of the geometric and arithmetic average DMS ERP for the Eurozone, weighted by the stock market capitalization for each of the years 2019-2023 inclusive, clearly shows the increase. The average ERP slightly declined from 4.95% in 2019 to 4.85% in 2020 and steadily increased thereafter to 5.06% in 2021, 5.20% in 2022 and to 5.23% in 2023. The average ERP over this five-year period was 5.06%.

[8] KPMG provides a DGM-based estimate of the ERP for Europe based on the implied equity returns of European indices, as well as of the S&P 500. See "Equity Market Risk Premium - Research Summary", KPMG, 31 December 2024. Bloomberg provides daily DGM-based estimates of the ERP for individual European countries under the 'Country Risk Premium' function. We use Bloomberg's DGM-based ERP estimates for individual Eurozone countries as of 31 December of each year to calculate a weighted average DGM-based ERP for the Eurozone.

TABLE 3: DMS ERP DATA 2019 - 2023

	Geometric Mean [A] %	Arithmetic Mean [B] %	Average [C] Average([A], [B]) %
2019	3.50	6.40	4.95
2020	3.38	6.31	4.85
2021	3.60	6.51	5.06
2022	3.79	6.62	5.20
2023	3.82	6.65	5.23
Average	3.62	6.50	5.06

Notes and sources:

Brattle calculation using data from Credit Suisse Global Investment Returns Sourcebook, 2019-2023, Table 11.

[A], [B]: Value-weighted average for the Eurozone.

30. In our 2021 report for the ACM, we selected an ERP of 5.0%, noting that although the average of the geometric and arithmetic means of the historical ERP had dropped to 4.85% in 2020, recent market developments and the available evidence from the DGMs indicated that the ERP had, if anything, increased. A value of 5.0% was also in line with the five-year average of the ERP (4.97%) and the value of the ERP selected by the ACM for other regulated sectors (5.0%).

31. In the present case, however, evidence from the DGMs do not provide us any indication as to whether the ERP has actually increased. Therefore, to determine the ERP to be included in the regulatory WACC for the Dutch water companies, we need to understand why the historical ERP has increased over the past three years.

32. There are two fundamental reasons why the ERP could have increased recently. First, market volatility has increased. Higher market volatility implies higher risk and, therefore, the need for a higher risk premium. Second, inflation has been relatively high in the last couple of years. All things equal, a higher inflation rate will lead to a higher ERP, to the extent that real equity returns are less negatively correlated to inflation than real bond returns.[9]

[9] The relation between the ERP and the inflation rate has been clearly identified as one of the drivers of the recent increase in the historical ERP by the Body of European Regulators of electronic Communications (BEREC). In particular, BEREC cites DMS' finding of a correlation of -0.21 between real equity returns and inflation and a correlation of -0.42 between real bond returns and inflation. See BEREC, WACC parameters Report 2024, BoR (24) 102, p. 60.

33. Based on the above considerations, the ERP should be increased relative to the 5.0% value selected in 2021. However, selecting the 2023 DMS ERP of 5.23% may be too high, because inflation rates have recently decreased from the very high levels recorded in 2022 and 2023. On balance, we find that a value of the ERP of 5.1% would adequately reflect the expected return of equity for investors over the next regulatory period. We apply this value in our calculation of the 2025-2027 WACC.

IV. Selection of Peers and Screening Tests

A. Potential Peers

34. The Dutch water distribution firms 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 water distribution firms. We can then estimate a beta value from these firms, which we call 'comparables' or 'peers'.

35. 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 drinking water companies, which would make 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.

36. In this report we begin with the 21 companies considered as potential peers in 2021.[10] We further check whether additional peers could be added to the sample by searching additional European and US water companies carrying out water treatment and distribution as their primary activity. As a result of this search, we end up adding one further US company as a candidate peer. Table 4 provides a list of the potential peers considered.

[10] See Brattle 2021 Report, Table 4.

TABLE 4: FIRMS SELECTED AS POTENTIAL PEERS

Potential peers		Country	Considered in 2021	Selected in 2021
European Water Companies				
Severn Trent PLC	[1]	United Kingdom	✓	✓
Pennon Group PLC	[2]	United Kingdom	✓	✓
United Utilities Group PLC	[3]	United Kingdom	✓	✓
Athens Water Supply & Sewerage	[4]	Greece	✓	✓
Tallinna Vesi	[5]	Estonia	✓	×
Thessaloniki Water and Sewerage Company SA	[6]	Greece	✓	×
Eaux de Royan SA	[7]	France	✓	×
US Water Companies				
California Water Service Group	[8]	United States	✓	✓
Essential Utilities Inc	[9]	United States	✓	✓
American Water Works Co Inc	[10]	United States	✓	✓
American States Water Co	[11]	United States	✓	✓
Middlesex Water Co	[12]	United States	✓	✓
SJW Group	[13]	United States	✓	✓
York Water Co	[14]	United States	✓	×
Artesian Resources Corp-Cl A	[15]	United States	×	×
European Network Companies				
Snam	[16]	Italy	✓	✓
Terna Rete Elettrica Nazionale	[17]	Italy	✓	✓
REN - Redes Energeticas Nacionais	[18]	Portugal	✓	✓
Red Electrica	[19]	Spain	✓	✓
Enagas	[20]	Spain	✓	✓
Elia Group SA/NV	[21]	Belgium	✓	✓
Fluxys Belgium	[22]	Belgium	✓	×

37. In the following sections, we describe how we test the potential peers for:

    a. Liquidity

    b. Minimum revenues from Regulated Activities

    c. No major Merger and Acquisition (M&A) activity over the estimation period

d. Minimum credit rating

B. Liquidity Tests

38. Illiquid stocks tend to underestimate the true industry beta.[11] Hence, for each of the potential peers in the initial sample, we test to see if the firms' shares are sufficiently liquid.

39. Since 2021, the ACM methodology requires to apply a bid-ask spread threshold of 1% as the primary liquidity criterion.[12] Accordingly, we calculate the average bid-ask spread as a percentage of the stock price over the reference period 1 June 2021 - 31 May 2024.[13] As illustrated in Figure 4, the 1% cut-off leads to the exclusion of Fluxys Belgium and Eaux de Royan.[14]

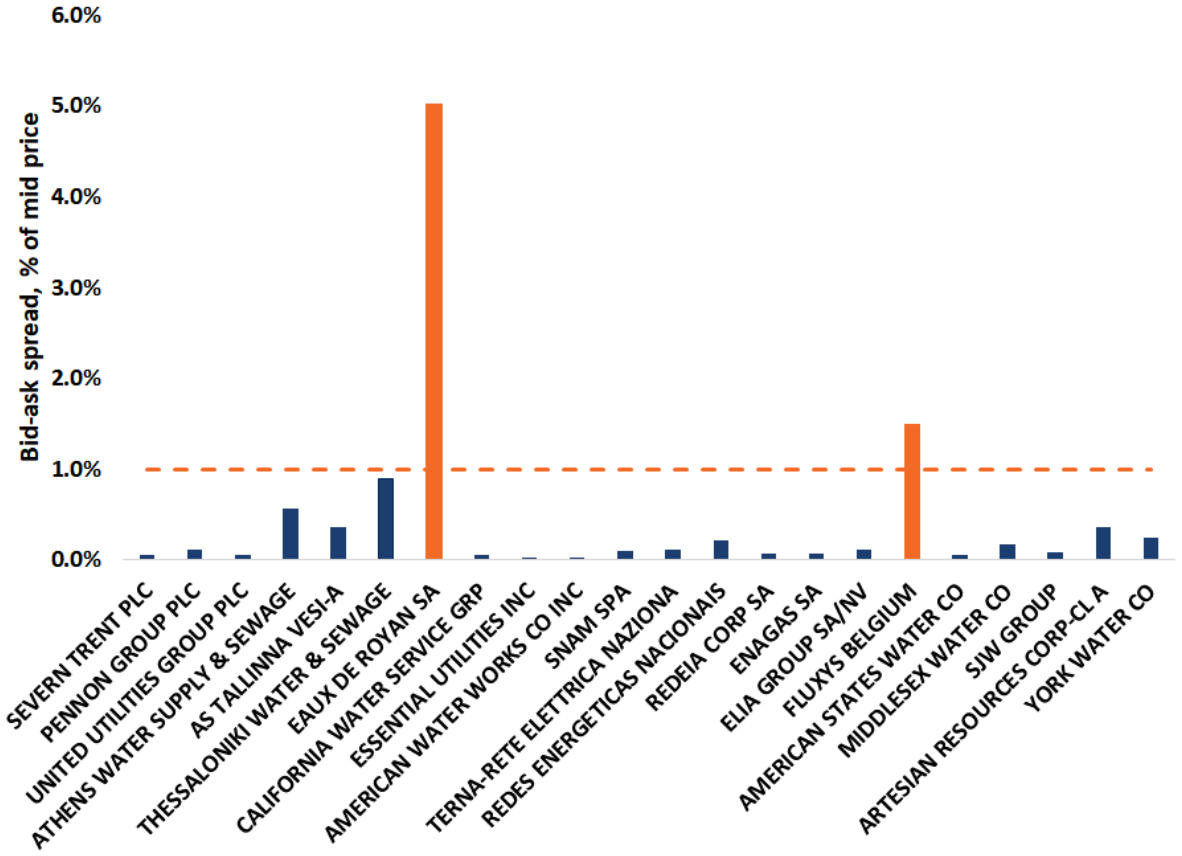
[11] To understand why this is true, for example, consider a firm with a true beta of 1.0, so that the firm's true value moves exactly in line with the market. Now suppose that the firm's shares are traded only every other day. In this case, the firm's actual share price will only react to news the day 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 the 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.

[12] 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.

[13] 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.

[14] We acknowledge a trade-off in using a lower cut-off point, which would potentially lead to exclude companies otherwise considered as sufficiently liquid. A cut-off of 0.5% would only lead to the exclusion of Thessaloniki water & Sewage and Athens Water Supply and Sewage.

FIGURE 4: BID-ASK SPREAD



40. We apply two further 'screens' related to liquidity. First, we test that each firm's shares trade frequently, the idea being that more frequent trading will give a more reliable beta estimate. We define a share as being sufficiently traded if it trades on more than 90% of days in which the relevant market index trades over the three-year period 1 June 2021 through 31 May 2024.[15] Second, we check that the peer companies have annual revenues exceeding €100 million in each of the last three years. This is because companies with low revenues may also be relatively illiquid. We have applied these criterions in previous reports for the ACM.[16]

41. Table 5 summarizes our results. Application of the two additional 'screens' leads to the exclusion of four additional companies: Thessaloniki Water and Sewerage Company Sa, Tallinna Vesi, Artesian Resources Corp and York Water Co.[17] We note that the exclusion of these additional companies has no material impact on beta.

[15] Specifically, we use the Euro Stoxx index for companies listed in countries in the Eurozone (Athens Water Supply & Sewerage, AS Tallinna Vesi, Thessaloniki Water & Sewage, Eaux de Royan, Snam Spa, Terna – Rete Elettrica, Redeia Corp Sa, Redes Energeticas Nacionais, Enagas Sa, Elia Group Sa and Fluxys Belgium), the FTSE All-Share index for companies listed in the UK (Severn Trent Plc, Pennon Group Plc, United Utilities Group Plc), the S&P 500 index for companies listed in the US (Essential Utilities Inc, California Water Service Group, American Water Works Co Inc, American States Water Co, SJW Group, York Water Co, Artesian Resources Corp and Middlesex Water Co).

[16] See footnote 1.

[17] Note that we already exclude Eaux de Royan Sa due to the high value of its bid-ask spread.

TABLE 5: TRADING FREQUENCY AND ANNUAL REVENUES

			% of days company traded	Total Revenues			Sense checks passed
				2021	2022	2023	
European and UK Water Companies							
Severn Trent PLC	EUR mln	[1]	99.34%	2,227	2,474	2,638	✓
Pennon Group PLC	EUR mln	[2]	99.34%	873	933	1,012	✓
United Utilities Group PLC	EUR mln	[3]	99.34%	2,151	2,151	2,205	✓
Athens Water Supply & Sewerage	EUR mln	[4]	97.02%	361	343	352	✓
Tallinna Vesi	EUR mln	[5]	98.32%	53	55	61	×
Thessaloniki Water and Sewerage Company SA	EUR mln	[6]	96.76%	74	71	73	×
Eaux de Royan SA	EUR mln	[7]	51.30%	22	n.a.	n.a.	×
US Water Companies							
California Water Service Group	EUR mln	[8]	100.00%	669	804	735	✓
Essential Utilities Inc	EUR mln	[9]	100.00%	1,588	2,173	1,899	✓
American Water Works Co Inc	EUR mln	[10]	100.00%	2,847	3,601	3,916	✓
American States Water Co	EUR mln	[11]	100.00%	422	467	551	✓
Middlesex Water Co	EUR mln	[12]	100.00%	121	154	154	✓
SJW Group	EUR mln	[13]	100.00%	485	589	n.a.	✓
Artesian Resources Corp-Cl A	EUR mln	[14]	100.00%	77	94	91	×
York Water Co	EUR mln	[15]	100.00%	47	57	66	×
European Network Companies							
Snam	EUR mln	[16]	99.48%	3,285	3,515	4,288	✓
Terna Rete Elettrica Nazionale	EUR mln	[17]	99.48%	2,535	2,898	3,123	✓
REN - Redes Energeticas Nacionais	EUR mln	[18]	100.00%	547	588	652	✓
Red Electrica	EUR mln	[19]	99.74%	1,953	2,015	2,064	✓
Enagas	EUR mln	[20]	99.74%	983	964	909	✓
Elia Group SA/NV	EUR mln	[21]	100.00%	2,725	3,854	3,848	✓
Fluxys Belgium	EUR mln	[22]	100.00%	573	913	593	✓

Notes and sources:
[4]-[22]: No data is available for 2024.
[7]: No public data is available for 2022-2024 period.

C. Regulated Revenues

42. The peer companies used to estimate beta should have a similar systematic risk to the Dutch drinking water companies, meaning that, if the value of the drinking water companies were observable, it would react to changes in market conditions in the same way as the value of the peer firms.

43. Because revenues for water production, transport and supply are regulated, they are less sensitive to changes in economic conditions than a firm operating in the free market. Ideally, the firms we select as peers should earn most of their revenues from a mix of regulated production, network and supply activities which are similar to the drinking water companies.

44. In our 2021 report for the ACM, we excluded companies reporting less than 80% of revenues from regulated production, network, or supply activities.[18] In Table 6, below, we report the share of regulated revenues for the candidate peers. Apart from Eaux de Royan, all companies report revenues from regulated activities separately.

45. As shown in Table 6, with the exception of Snam and American States Water regulated activities represent at least 80% of total revenues for all peers. In the case of Snam, however, the decline in regulated revenues in 2022-2023 largely reflects the increase in revenues from biomethane, carbon capture and storage and hydrogen. These revenues are derived from subsidized tariffs that are subject to significant public incentives. Hence, while they are not strictly regulated revenues, they are not sensitive to economic cycles, and are therefore similar to regulated revenues in the context of a beta calculation. Accordingly, we have decided to keep Snam in the sample.[19] Similarly, in the case of American States Water, regulated revenues have increased to 80% in 2023. Non-regulated revenues largely reflect contracted services which are directed to military bases.[20] Therefore, we keep American States Water in the final sample. We note that the inclusion of American States Water has no material impact on beta.

[18] The threshold for regulated revenues represents a trade-off between the criteria for the companies to be 'pure play', so that they only perform regulated activities as far as possible, while avoiding a threshold that is so high that it reduces the sample size excessively. In recent reports, we determined that an 80% threshold provided the right compromise between sample size and having a sufficiently large percentage of revenues from regulated activities.

[19] SNAM, FY 2023 Consolidated Results, 14 March 2024, p. 4.

[20] American States Water, Form 10K for Annual and Transition Reports, dated 31 December 2023, p.7.

TABLE 6: PERCENTAGE OF REGULATED REVENUES

		% of Regulated Revenues			Test passed
		2021	2022	2023	
European and UK Water Companies					
Severn Trent PLC	[1]	93%	92%	92%	✓
Pennon Group PLC	[2]	100%	100%	100%	✓
United Utilities Group PLC	[3]	100%	100%	100%	✓
Athens Water Supply & Sewerage	[4]	93%	92%	92%	✓
Tallinna Vesi	[5]	85%	90%	91%	✓
Thessaloniki Water and Sewerage Company SA	[6]	100%	100%	100%	✓
Eaux de Royan SA	[7]	n.a.	n.a.	n.a.	n.a.
US Water Companies					
California Water Service Group	[8]	100%	100%	100%	✓
Essential Utilities Inc	[9]	98%	97%	98%	✓
American Water Works Co Inc	[10]	100%	100%	100%	✓
American States Water Co	[11]	77%	77%	80%	✓
Middlesex Water Co	[12]	91%	92%	92%	✓
SJW Group	[13]	97%	97%	n.a.	✓
Artesian Resources Corp-Cl A	[14]	94%	91%	93%	✓
York Water Co	[15]	94%	91%	89%	✓
European Network Companies					
Snam	[16]	88%	77%	74%	✓
Terna Rete Elettrica Nazionale	[17]	87%	86%	84%	✓
REN - Redes Energeticas Nacionais	[18]	90%	92%	99%	✓
Red Electrica	[19]	86%	84%	83%	✓
Enagas	[20]	99%	99%	100%	✓
Elia Group SA/NV	[21]	100%	99%	100%	✓
Fluxys Belgium	[22]	92%	95%	90%	✓

Notes and sources:

Bloomberg

[7]: No public data is available.

[18]: Percentages have been recalculated to isolate the effect of negative revenues for 'Other' category.

D. M&A Activity

46. 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 generally 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.

47. 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. Based on our analysis of M&A activity, we do not exclude any company from the sample.

E. Credit Rating

48. 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 drinking water companies. To avoid this issue, we select as comparable firms with an investment grade credit rating.

49. Table 7 shows the credit rating of our potential peers, as assigned by the credit-rating agency Standard & Poor's (S&P). According to S&P's credit-rating scale, an investment grade rating is BBB- or higher.[21] S&P has assigned a credit rating to 15 of the firms selected and all of them have a rating of BBB or higher.

50. S&P does not report a credit rating for several of the firms included in our group of potential comparables. We consider that Pennon Group would be investment grade, as its license conditions require it to maintain financial metrics consistent with an investment grade credit rating and according to the last monitoring report it reported an investment grade rating.[22] Moreover, in its last financial statement the company stated it plans to get investment grade rating from two credit rating agencies by March 2025.[23]

51. There is also no credit rating for Athens Water Supply. This is likely because, since its listing on the Athens Exchange in 2000 and until 2013, the Company held only a relatively small amount of short-term debt, which seemed to fund working capital. From 2014 onwards, the

[21] S&P actually states that BBB is investment grade. Since S&P adds pluses and minuses to its credit ratings, we interpret a BBB- rating to be investment grade.

[22] For details on the requirement for British water firms to maintain an investment grade rating see Ofwat, Monitoring Financial Resilience, December 2020, p. 35. For details on the last monitoring performance see Ofwat, Monitoring Financial Resilience Report 22-23, p. 13.

[23] Pennon Group PLC, Full Year Results 2023/24, 21 May 2024, p. 3.

company did not arrange any bank debt, either long-term or short-term. Accordingly, a credit rating does not seem relevant for Athens Water Supply.

52. We do not investigate further the credit ratings of Eaux de Royan, Tallina Vesi, Thessaloniki Water, Artesian Resources Corp, York Water Co, and Fluxys, as these firms do not pass our liquidity and revenue tests.

TABLE 7. CREDIT RATING

		Rating S&P
European Water Companies		
Severn Trent Plc	[1]	BBB
Pennon Group Plc	[2]	n.a.
United Utilities Group Plc	[3]	BBB
Athens Water Supply & Sewage	[4]	n.a.
As Tallinna Vesi-A Equity	[5]	n.a.
Thessaloniki Water & Sewage	[6]	n.a.
Eaux De Royan Sa	[7]	n.a.
US Water Companies		
California Water Service Grp	[8]	A+
Essential Utilities Inc	[9]	A-
American Water Works Co Inc	[10]	A
American States Water Co	[11]	A
Middlesex Water Co	[12]	A
Sjw Group	[13]	A-
York Water Co	[14]	A-
Artesian Resources Corp-Cl A	[15]	n.a.
European Network Companies		
Snam Spa	[16]	BBB+
Terna Spa	[17]	BBB+
Redes Energeticas Nacionais	[18]	BBB
Red Electrica Corporacion Sa	[19]	A-
Enagas Sa	[20]	BBB
Elia System Operator Sa/Nv	[21]	BBB
Fluxys Belgium	[22]	n.a.

Notes and sources:

Extracted from Bloomberg as of 31 May 2024.

[3]: S&P Global Ratings, RatingsDirect, United Utilities Ltd, dated 21 December 2023.

[8]: S&P Global Ratings, US Regulatory Disclosure, California Water Service Co.

[2], [4]: Do not report any accumulated bank loans or corporate bonds.

[5], [6], [7], [15], [22]: Already excluded from the list of comparables.

F. The Final Sample of Peers

53. In Table 8, below, we provide a summary of the results of the screening tests we applied to arrive at our final sample of peers.

TABLE 8: SCREENING TESTS SUMMARY

	B-A spread	% days traded	M&A activity	Regulated Revenues	Revenues	Final sample
European Water Companies						
Severn Trent PLC	✓	✓	✓	✓	✓	✓
Pennon Group PLC	✓	✓	✓	✓	✓	✓
United Utilities Group PLC	✓	✓	✓	✓	✓	✓
Athens Water Supply & Sewerage	✓	✓	✓	✓	✓	✓
Tallinna Vesi	✓	✓	✓	✓	×	×
Thessaloniki Water and Sewerage Company SA	✓	✓	✓	✓	×	×
Eaux de Royan SA	×	×	✓	n.a.	×	×
US Water Companies						
California Water Service Group	✓	✓	✓	✓	✓	✓
Essential Utilities Inc	✓	✓	✓	✓	✓	✓
American Water Works Co Inc	✓	✓	✓	✓	✓	✓
American States Water Co	✓	✓	✓	✓	✓	✓
Middlesex Water Co	✓	✓	✓	✓	✓	✓
SJW Group	✓	✓	✓	✓	✓	✓
Artesian Resources Corp-Cl A	✓	✓	✓	✓	×	×
York Water Co	✓	✓	✓	✓	×	×
European Network Companies						
Snam	✓	✓	✓	✓	✓	✓
Terna Rete Elettrica Nazionale	✓	✓	✓	✓	✓	✓
REN - Redes Energeticas Nacionais	✓	✓	✓	✓	✓	✓
Red Electrica	✓	✓	✓	✓	✓	✓
Enagas	✓	✓	✓	✓	✓	✓
Elia Group SA/NV	✓	✓	✓	✓	✓	✓
Fluxys Belgium	×	✓	✓	✓	✓	×

Notes and sources:

✓ : The peer passes the test criteria.

× : The peer does not pass the test criteria.

V. Asset Beta

54. ACM's methodology specifies that the cost of equity will be estimated by applying the Capital Asset Pricing Model, which expresses the cost of equity for a business activity as the sum of a risk-free rate and a risk premium. The size of the risk premium depends on ERP and the systematic risk of the underlying asset, a parameter referred to as 'beta'.[24] Beta is commonly estimated as the covariance of a firm's equity value relative to the market as a whole.

55. As explained above, the Dutch water distribution firms are not listed. Accordingly, we estimate the systematic risk for Dutch water distribution using our peer group of firms which are publicly traded and derive the majority of their profits either from water distribution, or from a regulated network activity which appears to face similar systematic risk to water distribution.

A. Peer Group Equity Betas

56. 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.[25]

57. The relative risk of each peer, as summarized in its beta parameter, must be measured against an index representing the overall market. A hypothetical investor in a Dutch water firm would likely diversify its portfolio within a single currency zone so as to avoid exchange rate risk. Accordingly, to calculate market returns we use a broad Eurozone index (the Stoxx Europe 600 (SXXP Index)) for companies operating in the Eurozone. We use national indices for companies operating in the UK (the FTSE All-Share index (ASX Index)) and the US (the S&P 500 index (SPX Index)). Using indices from the relevant country or currency zone avoids exchange

[24] Further information on assumptions and theory underlying the CAPM can be found in most financial textbooks; see Brealey, Myers, Allen, *"Principles of Corporate Finance".*

[25] As mentioned above, we use the three-year period 1 June 2021 through 31 May 2024 as our estimation window for the beta of all firms on the peer group.

rate movements depressing the betas and should result in a higher beta estimate than if we estimated betas against an index derived in a different currency.[26]

58. 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 of autocorrelation.[27] We test for the presence of heteroskedasticity using the White's test and use White's-Huber robust standard errors.

59. 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.

60. 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.

61. We have performed this test for the firms in our peer groups. The test is significant only for one of the firms in the final sample. Hence for that firm we take the weekly beta.[28] For the remaining firms we take the daily beta. Table 9 shows our results.

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[26] For example, suppose we calculate the beta of a UK firm traded and earning profits in Pounds sterling (GBP) against an index denominated in Euros. Large changes in GBP-EUR exchange rates would reduce the beta. This is because, in Euro terms, the depreciation of the Euro would cause the returns of the UK firm to increase, while the Euro-denominated index has not changed. This reduces the covariance between the returns on the index and the return on the UK firm, which results in a lower estimate of beta. From the perspective of a Eurozone investor, the lower beta represents the diversification benefits of investing in another currency. However, it would not be correct to then apply this beta for a Eurozone investor investing in a firm in the Eurozone, which does not have the same diversification benefit, or for a UK investor investing in a UK firm. Hence, the reference index should be in the same currency as the listed shares of the firm for which we are estimating beta.

[27] We test for autocorrelation up to three 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.

[28] The weekly and daily betas for Elias Group SA were 0.64 and 0.55 respectively.

TABLE 9: EQUITY BETAS

	Beta [A]	Robust standard error [B]	Beta chosen [C]
European Water Companies			
Severn Trent PLC	0.53	0.06	Daily
Pennon Group PLC	0.66	0.09	Daily
United Utilities Group PLC	0.53	0.07	Daily
Athens Water Supply & Sewerage	0.45	0.06	Daily
US Companies			
California Water Service Group	0.57	0.05	Daily
SJW Group	0.45	0.05	Daily
American Water Works	0.68	0.04	Daily
Middlesex Water Co	0.58	0.06	Daily
Essential Utilities Inc	0.65	0.04	Daily
American States Water Co	0.52	0.05	Daily
European Network Companies			
Snam	0.64	0.05	Daily
Terna Rete Elettrica Nazionale	0.58	0.06	Daily
Red Electrica	0.39	0.05	Daily
REN - Redes Energeticas Nacionais	0.24	0.03	Daily
Enagas	0.42	0.05	Daily
Elia Group SA/NV	0.64	0.17	Weekly

B. Peer Group Asset Betas

62. 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 exactly the same activity, but one firm has more debt, that firm will have a higher equity beta than the firm with less debt.

63. 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.[29]

64. 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.

65. Table 10 illustrates both the equity betas and the asset betas for each firm. Overall, the asset betas range between 0.12 (REN - Redes Energeticas Nacionais) and 0.52 (American Water Works).

[29] 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 10: EQUITY AND ASSET BETAS

			Equity beta [A]	Gearing (D/E) [B]	Tax rate [C]	Asset beta [D]
European Water Companies						
Severn Trent PLC	United Kingdom		0.53	98.7%	23.0%	0.30
Pennon Group PLC	United Kingdom		0.66	107.2%	23.0%	0.36
United Utilities Group PLC	United Kingdom		0.53	112.1%	23.0%	0.28
Athens Water Supply & Sewerage	Greece		0.45	0.0%	22.0%	0.45
Median		[1]				0.33
US Companies						
California Water Service Group	United States		0.57	35.4%	27.0%	0.45
SJW Group	United States		0.45	78.4%	27.0%	0.28
American Water Works	United States		0.68	41.2%	27.0%	0.52
Middlesex Water Co	United States		0.58	24.8%	27.0%	0.49
Essential Utilities Inc	United States		0.65	56.8%	27.0%	0.46
American States Water Co	United States		0.52	22.6%	27.0%	0.44
Median		[2]				0.46
European Network Companies						
Snam	Italy		0.64	84.0%	24.0%	0.39
Terna Rete Elettrica Nazionale	Italy		0.58	63.9%	24.0%	0.39
Red Electrica	Spain		0.39	66.9%	25.0%	0.26
REN - Redes Energeticas Nacionais	Portugal		0.24	133.8%	21.0%	0.12
Enagas	Spain		0.42	83.4%	25.0%	0.26
Elia Group SA/NV	Belgium		0.64	64.1%	25.0%	0.43
Median		[3]				0.32

Notes and sources:
[B]: Calculated from Bloomberg data. Average values from Q2 2021 to 31 May 2024.
[C]: KPMG.
[D]: [A]/(1+(1-[C])x[B]).

C. Asset Beta for Dutch Water Distribution

66. Table 10 illustrates a range of asset betas. The median asset beta for European water companies is 0.33, the median asset beta for US water companies is 0.46, and the median asset beta for European network companies is 0.32. From this range, we must derive a single estimate for the asset beta for Dutch drinking water distribution.

67. There are several reasons to believe that the US water companies have structurally higher betas because of differences in regulation and the US water industry more generally. US firms have a price cap, rather than a revenue control. Firms with a price cap tend to have higher betas, because they face volume risk, which itself tends to be correlated to economic activity. In other words, a downturn in economic activity could cause a reduction in transported volumes, which in turn leads to reduced revenues and profits for the network. Hence price-cap regulation increases the correlation between the firm's share price and the market index, giving a higher beta. In the US, water companies change their tariffs or rates when either the water company or its customers asks for the tariff to be changed via a 'rate case'. Since rate cases are expensive and risky – in that tariffs could change in unpredictable ways – they tend to be only brought when a large change in the market has occurred. Accordingly, there is a qualitative case that the revenues for US water companies will tend to be more highly correlated with the market, since it is more likely that, for example, the water companies' customers will ask for lower rates when there is a decrease in economic activity. This does not occur in Europe, where tariff reviews or price controls take place at regular fixed intervals, independent of macroeconomic activity. Therefore, we conclude that the betas for US water companies are likely to overestimate the true beta for a Dutch water distribution firm.

68. European network firms, on the other hand, have similar regulation to Dutch water distribution firms, in that they are subject to a regulated revenue control. However, they are not water companies. In general, we expect that water demand may be less sensitive to macroeconomic conditions than demand for electricity or gas. To the extent that water demand may be less sensitive to macroeconomic conditions than demand for electricity or gas, the beta for European network firms may be higher than the beta for a Dutch water distribution firm. In practice, however, we observe that the asset betas of the European network firms in our sample are in line with the asset betas of the European water companies and that the median asset betas for the network companies is actually lower than the median asset beta for the water companies (see Table 10 above).

69. Based on the considerations above, we estimate the asset beta for the Dutch drinking water distribution by giving more weight to the European water companies and less weight to the US water companies and the European network. Specifically, we give the European water companies a 50% weight, and the US water companies and the European network firms a 25% weight each. Table 11 shows that this results in an asset beta of 0.36.

TABLE 11: ASSET BETA FOR DUTCH WATER DISTRIBUTION

		Median Beta [A]	Weight [B]
European Water Companies	[1]	0.33	50%
US Water Companies	[2]	0.46	25%
European Network Companies	[3]	0.32	25%
Weighted average	[4]	0.36	

Notes and sources:
[1] to [3]:
[A]: Table 10: Equity and Asset Betas.
[B]: Assumed.
[4][A]: [1][A]x[1][B]+[2][A]x[2][B]+[3][A]x[3][B].

D. Planned Investments and the Risk Profile of the Dutch Drinking Water Companies

70. The ACM has further asked us to evaluate whether expected developments and required investments in the drinking water sector could affect the cost of capital for the Dutch drinking water companies, in a way that the current method for determining the cost of capital does not reflect. In other words, we should determine if any additional adjustment is needed to the WACC generated by the current methodology, to account for required investments in the drinking water sector.

71. We start by noting that commitments to make 'large' investments may affect the cost of capital – and specifically the firm's beta. The issue is analogous to what financial analysts refer to with the notion of operating leverage. Operating leverage broadly refers to the ratio of fixed to variable costs. All else equal, high fixed costs mean that a variation in revenues will have a larger impact on profits. This is because only a smaller fraction of variable costs can be reduced in a case of a reduction in quantities or increased in case of an increase. Hence, firms with higher operating leverage will have profits that are more volatile and, therefore, tend to have higher betas.

72. For example, consider two firms in the same line of business. The two firms use different technologies. One firm has high fixed costs that do not vary with output and revenue and low variable costs. The other firm has high variable costs that do vary with output and revenue, and low fixed costs. Suppose that both firms experience a drop in revenue and output. The

firm with the high variable costs will also experience a drop in its costs, which will help maintain its profits. The firm with the high fixed costs will not be able to reduce its costs, so that as output falls profits will be 'squeezed' between falling revenues and the high fixed costs. The firm with the high fixed costs will experience a much larger drop in profits than the firm with high variable costs. Conversely, the firm with the high fixed costs will experience a larger increase in profits if output and revenue increase. This means that the profits of the firm with the high fixed costs will be more sensitive to changes in output and revenue.

73. The firm with the higher fixed costs will also have a higher beta. This is because, in essence, beta measures the relationship between changes in the value of the firm and changes in the value of the market index. The value of the firm is the present value of the future cash flows. Hence, as revenues decrease, assuming that the decrease is not short-lived, the value of the firm will also decrease. As forecast revenues decrease, the firm with the high fixed costs will experience a larger drop in value than the firm with the high variable costs. Suppose that the factors that led to the decrease in the firms' revenues also decrease the value of the market index. The value of the firm with the high fixed costs could drop by more than the market index, while the value of the firm with the high variable will increase by less than the market index. This means that the firm with the high fixed costs will have a higher beta than the firm with the high variable costs.

74. A similar effect applies when a firm commits to make large investments. This is because, from an *ex-ante* perspective, the volatility of future profits relative to current assets will increase.

75. To understand why, suppose that two regulated firms, A and B, both have a market value of 100 today, based on their current assets or RAB. Further, assume that the two firms face the same systematic risk on the assets. In a 'good state' of the economy, the firms' value will increase by 10%, and in a 'bad state' of the economy the firms' value will decrease by 10%. Hence, the value will vary between 90 and 110.

76. Now suppose that firm B plans to increase its assets by 100, and the new assets face the same risks as the old assets. Because the new investments will be remunerated at the firm's cost of capital, the expected value of firm B is still equal to 100. This is because the firm will create additional assets with a value of 100 but needs to spend 100 to create these assets. That is, the new assets have a net present value of zero. However, the expected value of the new assets will also vary by plus or minus 10%, depending on the state of the economy. That is, the net present value of the new assets varies from -10 (in the case that the assets cost 100 but have a value of only 90) and +10 (in the case that the assets cost 100 but have a value of 110). Hence, the value of Firm B now varies between 80 (being 90 for the existing assets and -10 from the new assets) and 120 (being 110 from the existing assets and +10 from the new assets). This is a variation of ±20%. The value of firm A, which has no new investments planned, varies from 90 to 110, or ±10%. Hence, the higher investment commitment of firm B increases the volatility of the firm's value. As a result, firm B will have a higher beta than firm A.

77. As with higher operating leverage, therefore, firms with higher investment requirements will have higher betas. Hence, increased future investment requirements for the Dutch drinking water companies could potentially increase their asset beta, relative to historic asset betas.

78. The effect of large investment commitments on a firm's beta is independent of how the firm finances the investments. That is, in the example above, the firm making the large investments could finance the new investments with the same mix of debt and equity as for their existing assets, and the firm's beta would still increase. Of course, if the firm also increased its gearing at the same time, then the effects would compound and the firm's equity beta would increase even further. But that is an effect that the current cost of capital method already accounts for.

79. We note that the effect of investments on beta that we discuss above only lasts while the firm is constructing the new assets. Once the firm constructs the new assets, and assuming the new assets have the same systematic risk and operating leverage as the original assets, and no other changes have occurred, beta will return to its original value. Returning to the example above, firm B will have doubled its RAB to 200, and the variation of the asset value with different states of the economy will be ±10%.

80. If the other water firms that we use to estimate beta have similar future investment commitments to the Dutch drinking water companies, then the beta of the comparable firms will already reflect the effect of future investments on beta. However, estimating the asset beta for Dutch drinking water companies based on firms with lower investment commitments could result in an underestimation of beta.

81. We note that some other regulators have accounted for the effect of future investments on beta. A prominent example comes from the airport sector, with the construction of Heathrow Terminal 5. In 2003, the UK Civil Aviation Authority (CAA) selected a WACC at the top of the range selected to remunerate the BAA's investments in Heathrow Terminal 5.[30] In that circumstance, the CAA found that BAA's investments in Heathrow Terminal 5 would increase Heathrow's RAB by over 70% over the following regulatory period, and that the construction of the new terminal would increase BAA's risks, not only with respect to regulatory and construction risk, but with respect to uncertain demand.[31] Other examples come from the telecommunication sector, in which premia for investments in new generation access (NGA)

[30] Note that the CAA decision made a separate determination on the WACC of each one of the three London airports owned by the BAA – that is, Heathrow, Gatwick, and Stanstead. Although the CAA decision is not explicit about the level of the uplift, we understand that the CAA ultimately set a real pre-tax WACC of 7.75%, 51 bps higher than the midpoint estimate presented by the Competition Commission. Economic Regulation of BAA London Airports (Heathrow, Gatwick, and Stansted) 2003 – 2008, CAA Decision (February 2003): paragraphs 4.35–4.80.

[31] More detail on the Heathrow Terminal 5 example is included in our report on the WACC for the Dutch Energy Networks. See Dan Harris and Lucrezio Figurelli, "The WACC for the Dutch Electricity TSO and Electricity and Gas DSOs" (April 2021), Box 1, page 27.

networks have been recognized to telecom operators to account, among other things, for the higher risk of a commitment to make large investments.[32]

82. The key factor to determining the effect on beta is not the absolute level of future investments, but their size relative to the current RAB. Accordingly, to determine whether and to what extent an adjustment to the beta of the Dutch drinking water companies is warranted, we have analysed the historical and expected evolution of the Dutch drinking water companies' capital expenditure and RAB.

83. The ACM has provided us with historical data on the RAB of the Dutch drinking water companies over the period 2016-2022, along with provisional data on expected capital expenditure and depreciation over the period 2022-2028. We estimate the evolution of the RAB over the period 2023-2028 by updating the 2022 RAB to account for (i) planned investments and (ii) depreciation.

84. In Table 12, below, we compare the evolution of the RAB over the period 2020-2024 with the expected evolution over the period 2024-2028. Overall, we estimate that over the period 2020-2024, the RAB of the Dutch Drinking water companies has increased by 21.78% on average, corresponding to an average annual compound growth rate (CAGR) of about 4.87%. Over the period 2024-2028, the RAB of the Dutch Drinking water companies is expected to increase by 36.28% on average, corresponding to an average CAGR of about 7.9%.

[32] In the case of telecoms, however, the provision of a risk premium for investments in NGA networks has been primarily justified by the high levels of build-out and take-up risks involved in the development of a fibre network when an existing copper network already allows operators to offer similar services to end-users.

TABLE 12: HISTORICAL AND EXPECTED EVOLUTION OF THE RAB FOR THE DUTCH DRINKING WATER COMPANIES

	2020-2024		2024-2028	
	Expected change [A]	CAGR [B]	Expected change [C]	CAGR [D]
Water Companies				
Brabant Water	2.22%	0.55%	34.36%	7.66%
Dunea	7.92%	1.92%	24.88%	5.71%
Evides	36.58%	8.10%	78.47%	15.58%
Oasen	39.59%	8.70%	36.23%	8.04%
PWN	18.78%	4.40%	21.52%	4.99%
Vitens	21.97%	5.09%	44.62%	9.66%
Waternet	20.87%	4.85%	36.16%	8.02%
WBG	24.31%	5.59%	44.92%	9.72%
WMD	51.26%	10.90%	30.21%	6.82%
WML	-5.68%	-1.45%	11.46%	2.75%
Average	21.78%	**4.87%**	36.28%	**7.90%**

Notes and sources:
Data provided by ACM.

85. The evidence above indicates that planned investments of the Dutch drinking water companies are expected to increase. The magnitude of the increase, however, is not large. Accordingly, the speed at which the RAB of the Dutch drinking water companies is expected to grow does not warrant an uplift to the beta. In the report on the WACC for the Dutch Electricity TSO and Electricity and Gas DSOs,[33] for example, we explained that a beta uplift is only warranted in case of an extraordinary increase in the RAB. In that report, we determined that TenneT's offshore transmission business met this criterion, with an expected annual RAB increase of 55.0% over the period 2019-2024. In contrast, we determined that annual RAB increases between 5% and 10% a year were not out of the ordinary and required no adjustment to the beta.

[33] See Dan Harris and Lucrezio Figurelli, "The WACC for the Dutch Electricity TSO and Electricity and Gas DSOs", 7 April 2021.

VI. Gearing

86. The ACM has asked us to evaluate a reasonable level of gearing (D/D+E) for the Dutch drinking water companies, also assessing whether this level is consistent with a single-A rating.

87. The relevant decree states that the financing structure used for calculating the WACC should be that which is considered reasonable for drinking water companies given the situation on the financial markets. The explanatory notes to the decree also state that this value may deviate from the actual equity capital of the Dutch drinking water companies. We also understand that there is a requirement that Dutch water distribution firms are financed by no more than 70% equity, so in other words that they have at least 30% debt. This places a minimum or floor on the gearing for Dutch water distribution firms.

88. In line with the ACM general WACC methodology and with the prescriptions of the applicable legislation, we calculate the gearing of the Dutch drinking water companies by reference to the median gearing of the peer group of European water distribution firms and European energy networks, bearing in mind the constraint to have at least 30% debt financing. Relative to the calculation of beta, we exclude US water companies from the peer group for selecting the gearing. As mentioned above, there are significant differences in regulation between European and US water companies, and these differences are likely to affect the efficient level of gearing.

89. We do not limit the sample to companies with an A-rating. This is reasonable, because many factors may affect the taking of water utilities in addition to gearing. For example, to get an A rating absent public ownership, and in a country with a lower sovereign credit rating than the Netherlands, a water company would need a much lower level of debt than a publicly owned water company in the Netherlands. Hence, Dutch water companies can sustain a higher level of debt and maintain an A rating than privately-owned water companies in other countries. In other words, there is no good reason to assume that A-rated companies with different ownership in other countries provide a good guide for the efficient level of gearing for a Dutch water company.

90. Consistent with the three-year reference period used to estimate the beta, we calculate the gearing (D/E) of each comparator as the three-year average of quarterly gearing ratios, obtained dividing quarterly net debt over quarterly market capitalization.

91. In Table 13, below, we report the gearing (D/A) for the peer group of European water companies and European Network companies. Overall, the gearing (D/A) for the entire group ranges between 0% (Athens Water) and 57% (REN). The median gearing is equal to 45.47%.

TABLE 13: GEARING FOR LISTED EUROPEAN PEERS

	Country	Rating [A] Table E5	D/A, Net [B] Table E7
European Water Companies			
Severn Trent PLC	United Kingdom	BBB	50%
Pennon Group PLC	United Kingdom	n.a.	46%
United Utilities Group PLC	United Kingdom	BBB	53%
Athens Water Supply & Sewerage	Greece	n.a.	0%
European Network Companies			
Snam	Italy	BBB+	46%
Terna Rete Elettrica Nazionale	Italy	BBB+	39%
Red Electrica	Spain	A-	40%
REN - Redes Energeticas Nacionais	Portugal	BBB	57%
Enagas	Spain	BBB	45%
Elia Group SA/NV	Belgium	BBB	38%
Average			**41.29%**
Median			**45.47%**

92. We next evaluate whether a 45.47% gearing is reasonable for the Dutch drinking water companies and whether it would also be consistent with a single-A credit rating.

93. In line with our 2021 report, we estimate the likely credit rating that the Dutch drinking water companies would get based on their actual gearing and their current financial position. In order to do so we apply Moody's rating methodology for regulated water utilities and rely on data provided by the ACM and Moody's credit rating decisions for TenneT and other rated energy networks in the Netherlands.[34]

94. In Table 14, below, we report the actual gearing (D/A) and likely rating of the Dutch drinking water companies based on Moody's rating methodology for regulated water utilities. The table reports both a baseline credit rating (column [E]), and a rating including a two-notch uplift to account for the public ownership and the strategic importance of the regulated business (column [F]). As we further explain in Appendix A, in rating regulated water utilities Moody's considers may apply an **uplift to the baseline rating** up to three notches for issuers that benefit from structural enhancements in their corporate structure, their regulatory license or their financing arrangements. We believe that applying a two-notch uplift to the

[34] See Moody's Investor Services, "Rating Methodology: Regulated Water Utilities", August 2023. See also, Moody's Investor Services, "TenneT Holding B.V.: Update to credit analysis" (June 2024), "N.V. Nederlandse Gasunie: Update to credit analysis" (July 2023), "Alliander N.V.: Update following publication of 2023 results" (April 2024), "Enexis Holding N.V.: Update to credit analysis" (February 2024).

baseline rating of the Dutch drinking water companies is reasonable. Dutch Energy Networks benefit from the stability of the Dutch regulatory framework and from the higher rating of the Dutch government debt (AAA). In rating the Dutch energy networks Gasunie and TenneT, for example, the rating agency Moody's applies two-notch uplift to the networks' baseline ratings to account for the Dutch government's ownership interest and the strategic importance of the business to national energy policy in the Netherlands. Similarly, Moody's has applied two-notch uplifts also to the baseline ratings of the Dutch DSOs Alliander and Enexis, reflecting a strong probability of support from their public owners, the importance of the networks' operations for the regional economy, and the strong governance framework in the Netherlands with oversight by the national government.

95. In Table 14, below, we report the actual gearing of the Dutch water companies as of 2023, with the exception of WBG and WML, for which we report the 2022 value. Overall, we find that the actual gearing of the Dutch water companies ranges between 31.5% (Brabant Water) and 75.0% (WMD), for an average gearing (D/A) of 60.4%. By applying Moody's rating methodology, we find that all Dutch water companies, based on their actual gearing and current financial position, would likely get a rating equal or above A- when including a two-notch uplift on their baseline rating.

96. Table 14 (row [11]) further reports the likely rating for a representative Dutch drinking water company, which was calculated based on the average gearing and financial position for the group. Overall, we find that a representative water company operating in the Netherlands would likely get a baseline credit rating of A-, which increases to A+ when we apply the two-notch uplift. We detail our analysis of the credit rating of the Dutch water companies in Appendix A.

TABLE 14: ACTUAL GEARING AND LIKELY RATING OF THE DUTCH DRINKING WATER COMPANIES

Company name		Year	D/A, Net	Overall score	Baseline rating	Rating with uplift
[A]		[B]	[C]	[D]	[E]	[F]
Brabant Water	[1]	2023	31.5%	5.46	A+	AA
Dunea	[2]	2023	56.0%	7.17	A-	A+
Evides	[3]	2023	62.2%	6.59	A-	A+
Oasen	[4]	2023	63.4%	8.35	BBB+	A
PWN	[5]	2023	63.0%	7.50	A-	A+
Vitens	[6]	2023	65.5%	7.50	A-	A+
Waternet	[7]	n.a.	n.a.	n.a.	n.a.	n.a.
WBG	[8]	2022	68.2%	8.05	BBB+	A
WMD	[9]	2023	75.0%	8.83	BBB	A-
WML	[10]	2022	59.0%	7.17	A-	A+
Mean	[11]		**60.4%**	**7.40**	A-	A+

Notes and sources:
[C]: Appendix A, Table 16.
[D]-[F]: Appendix Table 17 through Table 26.

97. Our analysis indicates that a single-A rating is consistent with a gearing of 60.4% for Dutch water companies. This level of gearing is higher than the assumed gearing of 45.47%. Accordingly, we conclude that a 45.47% would also be consistent with at least a single-A rating.

98. Determining the gearing based on a sample of European network firms is more likely to yield an efficient level of gearing than using the actual gearing of the Dutch water companies. If the ACM's WACC decision was based on the Dutch water companies actual gearing, in effect the companies would be able to pass through an inefficient capital structure to Dutch consumers. Looking at the gearing of other water companies and utilities is a reasonable way to determine the efficient capital structure for water distribution.

99. Finally, we note that the final WACC results are not sensitive to the choice of gearing, as long as the firms maintain an A credit rating. As gearing increases, the proportion of relatively cheap debt in the WACC formula increases. However, increased debt means more risk for equity holders, which results in a higher equity beta and a higher cost of equity. The cost of debt will also start to increase. These two effects – more relatively cheap debt versus increasing equity and eventually debt costs – largely offset one another.[35] For example, we estimate that the WACC 2025-2027 would increase by only 0.04 percentage points as the

[35] The insensitivity of the WACC to the financing choices under certain assumptions is known as the Modigliani–Miller theorem.

gearing increases from 45.47% to 60.4%. As long as the target level of debt and the credit rating assumed are consistent with one another, and the credit rating is reasonable given the country in which the firms operate, then the resulting WACC should be reasonable.

100. Given the observed gearing for European water and network companies, the need to maintain an A credit rating and the relative insensitivity of the WACC to the final choice of gearing (as long as it is consistent with an A rating), a gearing (D/A) level of 45.47% is reasonable and likely to reflect an efficient level of gearing for regulated water companies operating in the Netherlands.

VII. Cost of Debt

101. ACM's methodology for the drinking water sector specifies that the allowed cost of debt is set equal to the RFR for the cost of debt plus an average interest spread, or debt premium, and a 15-basis points allowance to account for the cost of issuing debt.

102. In section II, we calculated the RFR to be included in the cost of debt under the current and amended methodologies:

    a. **Under the current methodology**, the RFR is calculated based on the ten-year average yield on 10-year Dutch government bonds, resulting in a RFR of 0.75%.

    b. **Under the amended methodology**, the RFR is calculated based on the three-year average instead of the ten-year average, resulting in a RFR of 1.76%.

103. With respect to the debt premium, the methodology for the Dutch water sector requires to consider the spread on bonds issued by firms that engage in activities which are comparable to that of drinking water companies, and which have a rating of A, A+ or A- and a maturity of around 10-years.

104. In line with our 2021 report, to calculate the debt premium we consider the spread over the contemporaneous risk-free rate for a broad set of comparable bonds issued by firms engaged in similar activities to drinking water distribution.

105. In more detail, we first identify a 'long-list' of bonds issued by companies deriving most of their revenues from regulated activities in the energy or water sectors. To increase the sample size, we consider firms from around the world, and not only Europe, though we limit the currencies to Euros, GB Pounds, and US and Canadian Dollars.

106. We then screen the long-list to only include 'at maturity' bonds[36] with a rating of A- to A+ according to Standard & Poors' rating, and a maturity of between 9 to 11 years at any point in time over the 10-year period 1 June 2014 to 31 May 2024. Applying these criteria, we end up with a sample of 47 comparable bonds issued by 26 firms.

107. For each comparable bond, we collect weekly data[37] on each individual bond yields and on the contemporaneous yields of a relevant government bond. As the relevant government bond for each comparable bond, we consider the 10-year government bond of the country where the issuer predominantly operates. For example, for a bond issued by Elia we use the 10-year Belgian government bond. For each comparable bond, we then calculate the weekly spread over the relevant government bond during the period in which the bond had a 9 to 11 years maturity.

108. For each week over the ten-year period June 2014-May 2024, we then calculate the average weekly spread across bonds with a 9 to 11 years maturity. On average, in each week we consider about 5.86 bonds with an average maturity of 10 years.[38]

109. Figure 5, below, illustrates the evolution of the average weekly spread of the comparable bonds over the past ten years. Overall, we observe that the average spread of the comparable bonds has cyclically fluctuated from values below 1% to values around and even above 1.5%. The ten-year average spread for comparable bonds is 1.12%, whereas the three-year average

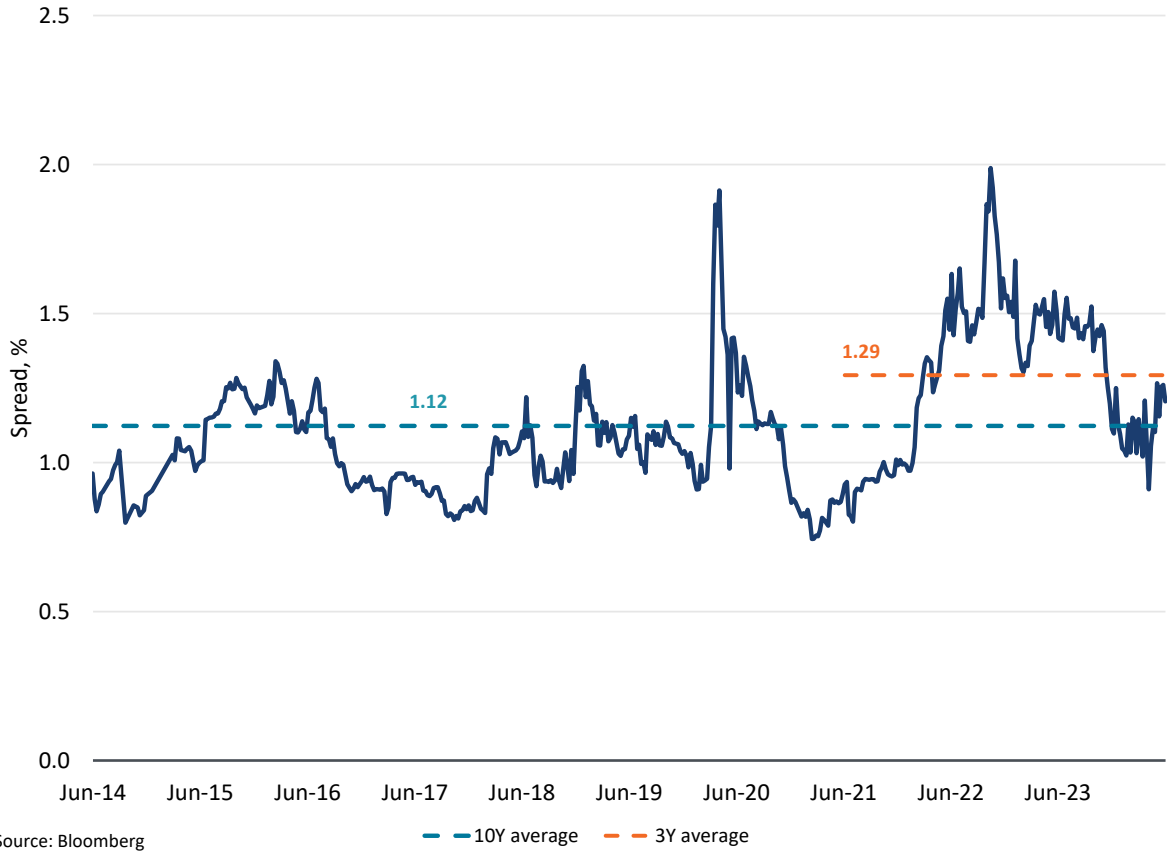
[36] In particular, we exclude from the list the so-called 'callable', 'putable', 'convertible' and 'sinkable' bonds as well as bonds linked to inflation. **Callable bonds** can be redeemed by the issuer prior to maturity and generally attract a higher yield than bonds that mature on a fixed date. Callable bonds cannot be compared on a like-for-like basis with Government bonds that have a fixed maturity, which is why we do not use them in our analysis. Callable bonds generally attract a higher yield because bonds are more valuable if interest rates fall, but in this scenario the callable bond may be re-deemed. Hence the bond holder has an asymmetric pay-off. **Putable bonds** give bond holders options to sell back bonds to issuers at one or several specific dates before maturity. When interest rates rise, investors could exercise such option and use the proceeds in higher-yield investments. Bond holders are generally willing to accept a lower yield to have such option. **Convertible bonds** are a type of bond that can be converted into equity at certain dates during their life. Convertible bonds usually attract a lower yield because investors could convert them into stocks and receive a higher yield when stock price arise. Sinkable bonds are bond issues backed by sinking funds, which set aside money on a regular basis to ensure that repayments will be made. Sinkable bonds have less risk to investor and allow the issuers to offer a lower interest rate to bond holders.

[37] More specifically, in order to limit the required amount of data and to make the analysis manageable, we collect yields of the comparable bonds and relevant government bonds every Friday over the period June 2014-May 2024.

[38] We exclude from the analysis observations in which only one, two or no bonds were available due to bank holidays in one or more countries. This led us to exclude 34 out of a total of 523 observations. Including these 34 observations would reduce the ten-year average spread by about 0.016%, from 1.123% to 1.107%.

spread is 1.29%.[39] We apply these values in the cost of debt calculation for current and amended methodologies, respectively.[40]

FIGURE 5: SPREAD OF A-RATED BONDS OVER RELEVANT GOVERNMENT BONDS



Source: Bloomberg

110. To make the calculation of the debt premium consistent with the calculation of the RFR, we consider the ten-year average spread under the current methodology and the three-year average spread under the amended methodology.

[39] We note that the approach we use in this report is slightly different from the approach we used in our 2021 report. In that report we first calculated the average spread for each individual bond over the period in which the bond had a 9-11 year maturity. We then considered the average of the average spreads of the individual bonds, thus assigning the same weight to each individual bond. Our proposed approach instead considers an average over time instead of across bonds, so that an equal weight is assigned to each year. To the extent that debt premia fluctuate over time, averaging over time is preferrable to averaging across bonds. In practice, however, our analysis considers a relatively stable number of bonds over the ten-year period, so that the two alternative approaches produce very similar results.

[40] As a further check to the reasonableness of our result, we have also analysed the evolution of the spread over the Dutch government bond of a 10-year utility index of bonds with a rating of A (IGEEUA10 BVLI. Index). Overall, the spread for the utility index follows a similar pattern as the spread for the comparable bonds, though at a lower level. The ten-year average spread for the utility index was 0.74%. As we explained in our 2021 report, however, the lower spread of the utility index is largely attributable to the higher liquidity of the larger bond issuances typically considered in this type of indices. Because Dutch water distribution firms are relatively small, they would likely command a higher spread than observed for utility index. Accordingly, we find that the spread observed for comparable bonds better reflects the cost of debt of the Dutch drinking water companies.

a. **Under the current methodology**, by adding a debt premium of 1.12% to a RFR of 0.75%, plus 15 basis points to account for the cost of issuing debt, we obtain a pre-tax cost of debt of 2.03% which we apply to the WACC for the regulatory period 2025-2027.

b. **Under the amended methodology**, by adding a debt premium of 1.29% to a RFR of 1.76%, plus 15 basis points to account for the cost of issuing debt, we obtain a pre-tax cost of debt of 3.20% which we apply to the WACC for the regulatory period 2025-2027.

VIII. WACC

111. Based on the preceding calculations and discussions, Table 15 illustrates the overall calculation of the nominal WACC for the Dutch drinking water companies for the next regulatory period 2025-2027.[41]

TABLE 15: WACC 2025-2027

			Current Method	Amended Method
Gearing (D/A)	[1]	Section VI	45.47%	45.47%
Gearing (D/E)	[2]	[1]/(1-[1])	83.37%	83.37%
Tax rate	[3]	Assumed	0.00%	0.00%
Risk free rate - Equity	[4]	Section II	1.74%	1.89%
Asset beta	[5]	Section V	0.36	0.36
Equity beta	[6]	[5]x(1+(1-[3])x[2])	0.66	0.66
Equity Risk Premium	[7]	Section III	5.10%	5.10%
After-tax cost of equity	[8]	[4]+[6]x[7]	5.11%	5.26%
Risk free rate - Debt	[9]	Section II	0.75%	1.76%
Debt premium	[10]	Section VII	1.12%	1.29%
Non-interest fees	[11]	Assumed	0.15%	0.15%
Pre-tax cost of debt	[12]	[9]+[10]+[11]	2.03%	3.20%
Nominal after-tax WACC	[13]	((1-[1])x[8])+([1]x(1-[3])x[12])	3.71%	4.32%
Nominal pre-tax WACC	[14]	[13]/(1-[3])	3.71%	4.32%

[41] The method assumes that since the water companies are publicly held and do not pay taxes, a tax rate of zero should be applied.

Appendix A: Rating Analysis for the Dutch Drinking Water Companies

112. In this appendix we first analyse Moody's rating methodology for regulated water utilities[42] and then apply it to estimate the likely credit rating of the Dutch drinking water companies using data from their annual accounts and information derived from Moody's credit rating decisions for TenneT and other rated energy networks in the Netherlands.

A.1 Moody's Credit Rating Methodology for Regulated Water Utilities

113. Moody's considers a broad number of factors to determine the credit rating of regulated water utilities, broadly related to the regulatory environment in which they operate and their current financial position and attitude towards risk. Figure 6, below, illustrates the different factors considered by Moody's along with the weight they carry for determining the over credit score.

114. The **Business Profile** of the regulated water utility accounts for 50% of the credit rating. This factor is divided in a number of sub-factors, relating to the stability and predictability of the regulatory environment (15%), asset ownership (5%), the ability to recover costs and investments (15%), revenue risk (5%), and the complexity of the investment program (10%). In rating these factors, Moody's makes qualitative considerations about the regulatory environment in which the firms operate. For example, in rating the "stability and predictability of the regulatory environment", Moody's would assign the highest scores to "*Issuers operating under regulatory regimes that have a very long track record of having clearly defined risk allocation principles that have been consistently applied and transparently disclosed to the public*", and the lowest scores to "*Issuers operating in a jurisdiction that has not implemented a defined regulatory framework or has implemented a framework that is extremely unpredictable or politically driven*".[43] Additional detail on the rating of these sub-factors can be found in Moody's Rating Methodology.

115. **Leverage and coverage ratios** account for another 40% of the credit rating. These financial ratios measure the ability of the regulated company to repay its debt. In particular, Moody's considers four (4) ratios:

[42] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023

[43] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.9.

a. The interest coverage ratio (**FFO Interest Coverage**) is sought to measure the capacity of the issuer to service its debt from its cash flows, or funds from operations (FFO).

b. Leverage (measured as **Net Debt over RAB**) measures the overall capacity of the issuer to repay its debt, as regulated water utilities service their debt principally through the return they earn on the capital invested.

c. The **FFO to Net Debt** ratio is a measure of "dynamic leverage". This measure can be a useful indicator of a company's ability to generate cash flows over a period of time.

d. The Retained Cash Flows or **RCF to Net Debt** ratio is also an indicator for financial leverage. However, in contrast to FFO to Net Debt, it considers the strength of a water utility's cash flow after dividend payments are made.

116. Figure 10, below, details the ratings that Moody's assigns for different values of these ratios. Additional detail on the calculation of these ratios can be found in Moody's Rating Methodology.

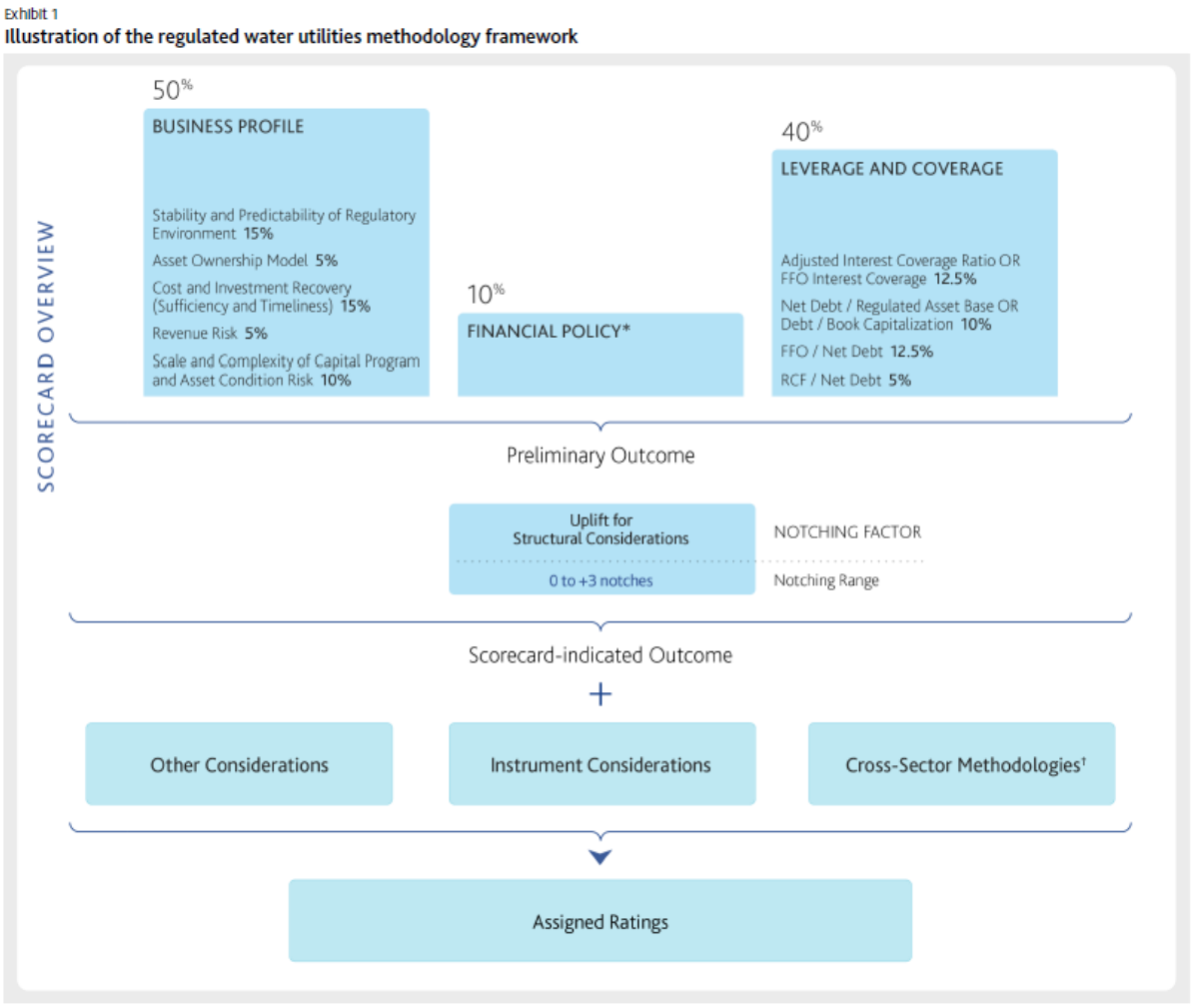
117. **Financial policy** accounts for the remaining 10% of the credit rating. This factor relates to "management and shareholder tolerance for financial risk". In rating this factor, Moody's aims to "*consider the likelihood that financial policy decisions, in their totality, could add uncertainty to future cash flow levels and divert resources away from creditors. In this regard, management's track record and their public commitment to maintaining the issuer's credit quality are key considerations.*" [44]

118. Finally, in addition to the factors above, which contribute to the determination of a baseline rating, Moody's considers whether to apply an **uplift for structural considerations**,[45] which can result in an uplift of up to three notches for issuers that benefit from structural enhancements in their corporate structure, their regulatory license, or their financing arrangements. Additional details on the applicability of a two-notch uplift to the baseline rating of regulated utilities in the Netherlands is provided in the following section.

[44] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.12.

[45] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.14.

FIGURE 6: MOODY'S SCORECARD FOR RATING REGULATED WATER UTILITIES[46]



* This factor has no sub-factors.
† Some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section
Source: Moody's Investors Service

119. Moody's determines the credit rating of regulated water utilities in a number of steps:

a. First, it assigns a rating and score to each sub-factor (see Figure 7).

b. Second, it determines an overall score as a weighted sum of the sub-factor scores. The sub-factor weight is calculated as the product of the sub-factor weight reported in Figure 6 times a further weight for the sub-factor rating reported in Figure 8 (which assigns a larger weight to sub-factors that receive a lower rating).

c. Based on the overall score determined in step 2, Moody's determines a baseline rating according to the correspondence reported in Figure 9.

d. Finally, Moody's evaluates whether the baseline rating should be adjusted to incorporate an uplift from structural considerations.

[46] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.3.

FIGURE 7: MOODY'S SCORE BY RATING[47]

Exhibit 4

Aaa	Aa	A	Baa	Ba	B	Caa
1	3	6	9	12	15	18

Source: Moody's Investors Service

FIGURE 8: MOODY'S FACTOR WEIGHTING BY RATING[48]

Exhibit 5

Aaa	Aa	A	Baa	Ba	B	Caa
1	1	1	1.15	2	3	5

Source: Moody's Investors Service

FIGURE 9: MOODY'S BASELINE RATING BY OVERALL SCORE[49]

Exhibit 6

Scorecard-indicated outcome

Scorecard-indicated outcome	Aggregate numeric score
Aaa	x < 1.50
Aa1	1.50 ≤ x < 2.50
Aa2	2.50 ≤ x < 3.50
Aa3	3.50 ≤ x < 4.50
A1	4.50 ≤ x < 5.50
A2	5.50 ≤ x < 6.50
A3	6.50 ≤ x < 7.50
Baa1	7.50 ≤ x < 8.50
Baa2	8.50 ≤ x < 9.50
Baa3	9.50 ≤ x < 10.50
Ba1	10.50 ≤ x < 11.50
Ba2	11.50 ≤ x < 12.50
Ba3	12.50 ≤ x < 13.50
B1	13.50 ≤ x < 14.50
B2	14.50 ≤ x < 15.50
B3	15.50 ≤ x < 16.50
Caa1	16.50 ≤ x < 17.50
Caa2	17.50 ≤ x < 18.50
Caa3	18.50 ≤ x < 19.50

Source: Moody's Investors Service

[47] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.19.

[48] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.20.

[49] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.20

FIGURE 10: MOODY'S RATING OF LEVERAGE AND COVERAGE FINANCIAL RATIOS[50]

Factor: Leverage and Coverage (Factor 3 — 40%)								
Adjusted Interest Coverage Ratio [1] OR FFO Interest Coverage [2]	12.5%	≥ 8x OR ≥ 10x	4.5x - 8x OR 7x - 10x	2.5x - 4.5x OR 4.5x - 7x	1.5x - 2.5x OR 2.5x - 4.5x	1.2x - 1.5x OR 1.8x - 2.5x	1.0x - 1.2x OR 1.5x - 1.8x	< 1.0x OR < 1.5x
Net Debt / Regulated Asset Base [3] OR Debt / Book Capitalization	10%	< 25%	25% - 40%	40% - 55%	55% - 70%	70% - 85%	85% - 100%	≥ 100%
FFO / Net Debt	12.5%	≥ 40%	25% - 40%	15% - 25%	10% - 15%	6% - 10%	4% - 6%	< 4%
RCF / Net Debt	5%	≥ 30%	20% - 30%	10% - 20%	6% - 10%	4% - 6%	2% - 4%	< 2%
Preliminary outcome								
Notching factor								
Uplift for Structural Considerations								
Rating uplift of up to 3 notches provided by structural features to scorecard-indicated outcome from Factors 1-3 above.								
Scorecard-indicated outcome								

A.2 Rating the Dutch Drinking Water Companies

120. The Dutch drinking water companies are not rated. Accordingly, to determine whether a target level of gearing would be consistent with a single-A rating, we have collected information on the actual gearing and current financial position of the Dutch drinking water companies and reviewed recent Moody's rating decisions for TenneT and other rated energy networks in the Netherlands.

121. We have applied Moody's rating methodology to estimate a rating for each of the Dutch drinking water companies as follows:

a. We calculate the leverage and coverage ratios and apply Moody's rating guidelines to assign a credit score on these sub-factors.

b. We set the credit score that each water company would get on the other rating sub-factors equal to the score that Moody's has assigned to TenneT in its latest rating decision.[51]

c. We apply Moody's methodology to convert the credit scores to a 'baseline' credit rating.

d. We then apply a two-notch uplift to the baseline rating to reflect the Dutch drinking water companies' public ownership, in line with two-notch rating uplift that Moody's applies to TenneT, Gasunie, Alliander and Enexis.[52]

122. Table 16, below, reports our calculation of the four leverage and coverage ratios considered by Moody's for Dutch Drinking Water companies, as of 2022 and 2023. At the top of the table, we report the range of values of each metric for which Moody's would assign a BBB-rating.

a. **FFO Interest Coverage**: Moody's assigns a BBB-rating for this sub-factor for a value of the ratio between 2.5 and 4.5. The ratio is calculated as FFO plus Interest Expense divided by

[50] See Moody's Investors Service, "Rating Methodology: Regulated Water Utilities", dated 18 August 2023, p.6

[51] See Moody's Investor Services, "TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.

[52] See Moody's Investor Services, "N.V. Nederlandse Gasunie: Update to credit analysis", dated 17 July 2023; Moody's Investor Services, "TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024; Moody's Investor Services, "Alliander N.V.: Update following publication of 2023 results", dated 25 April 2024; and Moody's Investor Services, "Enexis Holding N.V.: Update to credit analysis", dated 12 February 2024.

Interest Expense. Higher values of the ratio indicate higher availability of funds relative to interest, and thus higher ratings. All Dutch drinking water companies have a value of this ratio above the BBB-threshold, consistent with a rating equal or higher than A.

b. **Net Debt over RAB**: Moody's assigns a BBB-rating to leverage or gearing (D/A) levels in the range 55%-70%. As the table indicates, most Dutch drinking water companies – with the exception of Brabant Water – are highly levered, with an average gearing of 60.5%, consistent for a BBB-rating on this sub-factor.

c. **FFO over Net Debt**: Moody's assigns a BBB-rating for this sub-factor for a value of the ratio between 10% and 15%. Higher values of this ratio lead to a higher rating. As the table indicates, most Dutch drinking water companies – with the exception of Brabant Water and Evides – have a value of the FFO/Net Debt Ratio within or in close proximity of the BBB range.

D. **RCF over Net Debt**: The RCF/Net Debt Ratio is similar to the FFO/Net Debt Ratio, but nets dividends out of the calculation. RCF are in fact calculated as FFO minus Dividends. Moody's assigns a BBB-rating for this sub-factor for a value of the ratio between 6% and 10%. Higher values of this ratio lead to a higher rating. As the table indicates, all Dutch drinking water companies except for Oasen, WBG, and WMD have an RCF/Net Debt Ratio consistent with a rating equal or higher than A.

TABLE 16: LEVERAGE AND COVERAGE OF THE DUTCH WATER COMPANIES

		FFO Interest Coverage	Net Debt/RAB	FFO/Net Debt	RCF/Net Debt
BBB Range		**2.5-4.5x**	**55%-70%**	**10%-15%**	**6-10%**
		[A]	[B]	[C]	[D]
Dutch Water Companies					
Brabant Water	[1]	15.42	31.5%	33.5%	33.5%
Dunea	[2]	8.01	56.0%	11.9%	11.9%
Evides	[3]	12.95	62.2%	19.2%	16.2%
Oasen	[4]	5.29	63.4%	8.8%	8.8%
PWN	[5]	6.40	63.0%	12.3%	12.3%
Vitens	[6]	6.04	65.5%	12.5%	12.5%
Waternet	[7]	n.a.	n.a.	n.a.	n.a.
WBG	[8]	7.39	68.2%	9.4%	9.4%
WMD	[9]	6.07	75.0%	8.2%	8.2%
WML	[10]	7.24	59.0%	13.7%	13.7%
Mean	**[11]**	**8.31**	**60.4%**	**14.4%**	**14.1%**

Notes and sources:

[A]: (FFO + Interest Expense) / Interest Expense. FFO are calculated as: Cash from Operations - Changes in Non-Cash Working Capital.

[B]: Net Debt/RAB for Dutch water companies.

[C]: FFO/Net Debt.

[D]: RCF/Net Debt. RCF are calculated as: FFO - Dividends.

[1]-[10]: Data from companies' annual reports.

[8], [10]: Since data for 2023 is not available I use the financial ratios calculated for the year 2022.

123. In Table 17, below, we estimate the likely rating of the representative Dutch drinking water company based on the methodology discussed above and applying the average leverage and coverage ratios of the Dutch drinking water companies. Overall, we estimate that a representative Dutch drinking water company would likely get a baseline credit rating of A-, which increases to A+ when we apply a two-notch uplift.

124. We believe that applying a two-notch uplift to the baseline rating of the drinking water companies is reasonable. Dutch Energy Networks benefit from the stability of the Dutch regulatory framework and from the higher rating of the Dutch government debt (AAA). In rating the Dutch energy networks Gasunie and TenneT, for example, the rating agency Moody's applies two-notch uplift to the networks' baseline ratings to account for the Dutch government's ownership interest and the strategic importance of the business to national

energy policy in the Netherlands.[53] Similarly, Moody's has applied two-notch uplifts also to the baseline ratings of the Dutch DSOs Alliander and Enexis, reflecting a strong probability of support from their public owners, the importance of the networks' operations for the regional economy, and the strong governance framework in the Netherlands with oversight by the national government.[54]

[53] See Moody's Investor Services, "N.V. Nederlandse Gasunie: Update to credit analysis", dated 17 July 2023; Moody's Investor Services, "TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.

[54] See Moody's Investor Services, "Alliander N.V.: Update following publication of 2023 results", dated 25 April 2024; and Moody's Investor Services, "Enexis Holding N.V.: Update to credit analysis", dated 12 February 2024.

TABLE 17: LIKELY RATING OF THE REPRESENTATIVE DUTCH DRINKING WATER COMPANY

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	8.31	AA	3.00	1.00	0.13
Net Debt/RAB	[10]	10%	60.4%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	14.4%	BBB	9.00	1.15	0.14
RCF/Net Debt	[12]	5%	14.1%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**7.17**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

125. In section VI, we determined that a target gearing (D/A) level of 45.47%, calculated as the median gearing (D/A) among European water and network companies. The analysis above indicates that such a level of gearing is consistent with a single-A rating. In fact, Table 17 demonstrates that a representative Dutch drinking water company with a gearing of 60.4%

would be able to obtain a single-A rating. A lower gearing of 45.47% would, if anything, improve the companies' ratings on all four leverage and coverage ratios. Put simply, if a Dutch drinking water company is able to obtain a single-A rating with a gearing of 60.4%, then it will obtain a rating equal or higher that single-A with a 45.47% gearing.

126. Table 18 through Table 26 detail our calculation of the likely credit rating of the individual Dutch Water companies.

TABLE 18: RATING OF BRABANT WATER

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	15.42	AAA	1.00	1.00	0.13
Net Debt/RAB	[10]	10%	31.5%	AA	3.00	1.00	0.10
FFO/Net Debt	[11]	13%	33.5%	AA	3.00	1.00	0.13
RCF/Net Debt	[12]	5%	33.5%	AAA	1.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**5.46**					
Baseline Rating	**[15]**	**A+**					
Rating with uplift	**[16]**	**AA**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 19: RATING OF DUNEA

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	8.01	AA	3.00	1.00	0.13
Net Debt/RAB	[10]	10%	56.0%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	11.9%	BBB	9.00	1.15	0.14
RCF/Net Debt	[12]	5%	11.9%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**7.17**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 20: RATING OF EVIDES

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	12.95	AAA	1.00	1.00	0.13
Net Debt/RAB	[10]	10%	62.2%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	19.2%	A	6.00	1.00	0.13
RCF/Net Debt	[12]	5%	16.2%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**6.59**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 21: RATING OF OASEN

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	5.29	A	6.00	1.00	0.13
Net Debt/RAB	[10]	10%	63.4%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	8.8%	BB	12.00	2.00	0.25
RCF/Net Debt	[12]	5%	8.8%	BBB	9.00	1.15	0.06
Total	**[13]**	**100%**					
Overall Score	**[14]**	**8.35**					
Baseline Rating	**[15]**	**BBB+**					
Rating with uplift	**[16]**	**A**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 22: RATING OF PWN

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	6.40	A	6.00	1.00	0.13
Net Debt/RAB	[10]	10%	63.0%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	12.3%	BBB	9.00	1.15	0.14
RCF/Net Debt	[12]	5%	12.3%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**7.50**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 23: RATING OF VITENS

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	6.04	A	6.00	1.00	0.13
Net Debt/RAB	[10]	10%	65.5%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	12.5%	BBB	9.00	1.15	0.14
RCF/Net Debt	[12]	5%	12.5%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**7.50**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 24: RATING OF WBG

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	7.39	AA	3.00	1.00	0.13
Net Debt/RAB	[10]	10%	68.2%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	9.4%	BB	12.00	2.00	0.25
RCF/Net Debt	[12]	5%	9.4%	BBB	9.00	1.15	0.06
Total	**[13]**	**100%**					
Overall Score	**[14]**	**8.05**					
Baseline Rating	**[15]**	**BBB+**					
Rating with uplift	**[16]**	**A**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 25: RATING OF WMD

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	6.07	A	6.00	1.00	0.13
Net Debt/RAB	[10]	10%	75.0%	BB	12.00	2.00	0.20
FFO/Net Debt	[11]	13%	8.2%	BB	12.00	2.00	0.25
RCF/Net Debt	[12]	5%	8.2%	BBB	9.00	1.15	0.06
Total	**[13]**	**100%**					
Overall Score	**[14]**	**8.83**					
Baseline Rating	**[15]**	**BBB**					
Rating with uplift	**[16]**	**A-**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.

TABLE 26: RATING OF WML

Factor		Factor Weighting	Estimate	Rating	Score	Rating factor	Adjusted Weight
Business Profile	**[1]**	**50%**					
Stability and Predictability of Regulatory Environment	[2]	15%		AA	3.00	1.00	0.15
Asset Ownership Model	[3]	5%		AA	3.00	1.00	0.05
Cost and Investment Recovery (Sufficiency & Timeliness)	[4]	15%		A	6.00	1.00	0.15
Revenue Risk	[5]	5%		A	6.00	1.00	0.05
Scale and Complexity of Capital Programme & Asset Condition Risk	[6]	10%		BB	12.00	2.00	0.20
Financial Policy	**[7]**	**10%**		BBB	9.00	1.15	0.12
Leverage and Coverage	**[8]**	**40%**					
FFO Interest Coverage	[9]	13%	7.24	AA	3.00	1.00	0.13
Net Debt/RAB	[10]	10%	59.0%	BBB	9.00	1.15	0.12
FFO/Net Debt	[11]	13%	13.7%	BBB	9.00	1.15	0.14
RCF/Net Debt	[12]	5%	13.7%	A	6.00	1.00	0.05
Total	**[13]**	**100%**					
Overall Score	**[14]**	**7.17**					
Baseline Rating	**[15]**	**A-**					
Rating with uplift	**[16]**	**A+**					

[1]: SUM([2]-[6])
[2]-[7]: See Moody's, TenneT Holding B.V.: Update to credit analysis", dated 4 June 2024.
[8]: SUM([9]-[12])
[9]-[12]: See Table 16.
[13]: [1]+[7]+[8]
[14]: Scores weighted average.
[15]: See Figure 9.