



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

August 11, 2021

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. G-9, Sub 722 – Petition for Consolidated Construction/Redelivery Agreement; G-9, Sub 781 – Application for General Rate Increase; and G-9, Sub 786 – Application of Piedmont Natural Gas Company, Inc., for Modifications to Existing Energy Efficiency Program and Approval of New Energy Efficiency Programs

Dear Ms. Dunston:

Attached for filing in the above-referenced docket is the confidential testimony and exhibit(s) of John R. Hinton, Director, Economic Research Division.

By copy of this letter, I am forwarding a copy of the redacted version to all parties of record by electronic delivery. The confidential version will be provided to those parties that have entered into a confidentiality agreement.

Sincerely,

Electronically submitted
s/ Elizabeth D. Culpepper
Staff Attorney
elizabeth.culpepper@psncuc.nc.gov

s/ Megan Jost
Staff Attorney
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Attachment

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. G-9, SUB 722
DOCKET NO. G-9, SUB 781
DOCKET NO. G-9, SUB 786

DOCKET NO. G-9, SUB 722)

)
In the Matter of)
Consolidated Natural Gas Construction)
and Redelivery Services Agreement)
Between Piedmont Natural Gas)
Company, Inc., and Duke Energy)
Carolinas, LLC)

DOCKET NO. G-9, SUB 781)

)
In the Matter of)
Application of Piedmont Natural Gas)
Company, Inc., for an Adjustment of)
Rates, Charges, and Tariffs Applicable)
to Service in North Carolina)

TESTIMONY OF
JOHN R. HINTON
PUBLIC STAFF – NORTH
CAROLINA UTILITIES
COMMISSION

DOCKET NO. G-9, SUB 786)

)
In the Matter of)
Application of Piedmont Natural Gas)
Company, Inc., for Modification to)
Existing Energy Efficiency Program and)
Approval of New Energy Efficiency)
Programs)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. G-9, SUB 722

DOCKET NO. G-9, SUB 781

DOCKET NO. G-9, SUB 786

**TESTIMONY OF JOHN R. HINTON
ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION**

AUGUST 11, 2021

1 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS**
2 **ADDRESS FOR THE RECORD.**

3 A. My name is John R. Hinton and my business address is 430 North
4 Salisbury Street, Dobbs Building, Raleigh, North Carolina. I am the
5 Director of the Economic Research Division of the Public Staff –
6 North Carolina Utilities Commission (Public Staff). My qualifications
7 and experience are provided in Appendix A.

8 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
9 **PROCEEDING?**

10 A. The purpose of my testimony is to present to the North Carolina
11 Utilities Commission (Commission) the results of my analysis and
12 my recommendations as to the fair rate of return to be used in
13 establishing rates for natural gas distribution utility service
14 provided by Piedmont Natural Gas Company, Inc. (Piedmont or the
15 Company), and to discuss Piedmont's gas extension practices for

1 residential and commercial customers that involve customer
2 contribution in aid of construction (CIAC) costs.

3 **Q. WHAT IS THE CURRENTLY APPROVED COST OF CAPITAL**
4 **FOR PIEDMONT?**

5 A. In the last Piedmont general rate case (Docket No. G-9, Sub 743),
6 the Commission approved an overall cost of capital of 7.414%,
7 which is comprised of a capital structure ratio of 47.15% long-term
8 debt, 0.85% short-term debt, and 52.00% common equity. The
9 overall weighted cost rate includes 4.41% for long-term debt, 2.72%
10 for short-term debt, and 9.70% cost of common equity.

11 **Q. WHAT IS THE COST OF CAPITAL REQUESTED BY PIEDMONT**
12 **IN THIS PROCEEDING?**

13 A. Piedmont has requested an overall cost of capital or rate of return
14 of 7.27%. This rate of return is based on a capital structure
15 consisting of 47.45% long-term debt, 0.55% short-term debt, and
16 52.00% common equity as noted in the testimony of Company
17 witness Newlin. The overall weighted cost rate includes 4.08% for
18 long-term debt, 0.35% for short-term debt, and 10.25% cost of
19 common equity.

1 **Q. HOW DOES PIEDMONT WITNESS D’ASCENDIS**
2 **DEVELOP HIS RECOMMENDED 10.25% COST OF EQUITY?**

3 A. Company witness D’Ascendis utilizes three cost of equity methods:
4 (1) the Discounted Cash Flow (DCF) model; (2) the Risk Premium
5 method; and (3) the Capital Asset Pricing Model (CAPM). He
6 applies these three methodologies to a proxy group of eight publicly
7 traded natural gas distribution companies. Company witness
8 D’Ascendis also utilizes the cost of equity applied to a proxy group
9 of 47 domestic, non-price regulated companies (Non-Price
10 Regulated Companies). His first method relies on the DCF model
11 which produced a 9.46% cost rate of equity with individual company
12 estimates ranging from 7.22% to 12.39% as shown on page 1 of
13 Schedule DWD-2. The witness includes results from a Risk
14 Premium Model and a similar model that encompasses a “Total
15 Market Approach”. Both the Risk Premium Model and the Total
16 Market Approach rely on prospective and current interest rates. The
17 average result of these two models, using prospective interest
18 rates, is 10.11%, and the average result using current interest rates
19 is 9.64% as shown on page 1 of Schedule DWD-3. Company
20 witness D’Ascendis includes results from his CAPM analysis, using
21 prospective interest rates, which generated a cost rate of 12.05%,
22 and using current interest rates, which generated a cost rate of
23 11.83%, as shown on page 1 of Schedule DWD-4. With respect to

1 witness D'Ascendis' DCF, Risk Premium, and CAPM analyses for
2 Non-Price Regulated Companies, he concludes that a 12.18% cost
3 rate using projected interest rates was indicative of the cost of
4 common equity, as shown on page 1 of Schedule DWD-6 . He also
5 opines that the cost of equity should include a 12 basis point adder
6 for flotation costs and ultimately recommends a 10.25% cost rate
7 for common equity based on all of his analyses.

8 **Q. WHAT IS THE OVERALL RATE OF RETURN RECOMMENDED**
9 **BY THE PUBLIC STAFF?**

10 A. The Public Staff recommends an overall rate of return of 6.75%.
11 This is based on a capital structure consisting of 48.80% long-term
12 debt, 0.67% short-term debt, and 50.53% common equity. The
13 overall weighted cost rate includes a 4.08% cost of long-term debt,
14 0.20% for short-term debt, and 9.42% cost of common equity.

15 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY**
16 **STRUCTURED?**

17 A. The remainder of my testimony is structured as follows:
18 I. Legal and Economic Guidelines for Fair Rate of Return
19 II. Current Financial Market Conditions
20 III. Appropriate Capital Structure and Cost Debt
21 IV. Cost of Common Equity Capital
22 V. Review of D'Ascendis' Testimony

1 VI. Summary and Recommendations

2 VII. Revisions to the Gas Extension Feasibility Model

3 **I. LEGAL AND ECONOMIC GUIDELINES FOR FAIR RATE OF RETURN**

4 **Q. PLEASE BRIEFLY DESCRIBE THE ECONOMIC AND LEGAL**
5 **FRAMEWORK OF YOUR ANALYSIS.**

6 A. Public utilities possess certain characteristics of natural
7 monopolies. For instance, it is more efficient for a single firm to
8 provide a service such as natural gas utility service than for two or
9 more firms to offer the same service in the same area. Therefore,
10 regulatory bodies have assigned franchised territories to public
11 utilities to provide services more efficiently and at a lower cost to
12 consumers.

13 **Q. WHAT IS THE ECONOMIC RELATIONSHIP BETWEEN RISK**
14 **AND THE COST OF CAPITAL?**

15 A. The cost of equity capital to a firm is equal to the rate of return
16 investors expect to earn on the firm's securities given the securities'
17 level of risk. An investment with a greater risk will require a higher
18 expected return by investors. In *Federal Power Com. v. Hope*
19 *Natural Gas Co.*, 320 U.S. 591, 603, (1944) (*Hope*), the United
20 States Supreme Court stated:

21 [T]he return to the equity owner should be
22 commensurate with returns on investments in other
23 enterprises having corresponding risks. That return,
24 moreover, should be sufficient to assure confidence in

1 the financial integrity of the enterprise, so as to
2 maintain its credit and to attract capital.

3 In *Bluefield Waterworks & Improvement Co. v. Public Service*
4 *Comm'n*, 262 U.S. 679, 692-93, (1923) (*Bluefield*) the United States
5 Supreme Court stated:

6 A public utility is entitled to such rates as will permit it
7 to earn a return on the value of the property which it
8 employs for the convenience of the public equal to
9 that generally being made at the same time and in the
10 same general part of the country on investments in
11 other business undertakings which are attended by
12 corresponding risks and uncertainties, but it has no
13 constitutional right to profits such as are realized or
14 anticipated in highly profitable enterprises or
15 speculative ventures. The return should be
16 reasonably sufficient to assure confidence in the
17 financial soundness of the utility, and should be
18 adequate, under efficient and economical
19 management, to maintain and support its credit and
20 enable it to raise the money necessary for the proper
21 discharge of its public duties. A rate of return may be
22 reasonable at one time and become too high or too
23 low by changes affecting opportunities for investment,
24 the money market, and business conditions generally.

25 These two decisions recognize that utilities are competing for the
26 capital of investors and provide legal guidelines as to how the
27 allowed rate of return should be set. The decisions specifically
28 speak to the standards or criteria of capital attraction, financial
29 integrity, and comparable earnings. The *Hope* decision, in
30 particular, recognizes that the cost of common equity is
31 commensurate with risk relative to investments in other enterprises.
32 In competitive capital markets, the required return on common
33 equity will be the expected return foregone by not investing in

1 alternative stocks of comparable risk. Thus, in order for the utility to
2 attract capital, possess financial integrity, and exhibit comparable
3 earnings, the return allowed on a utility's common equity should be
4 that return required by investors for stocks with comparable risk. As
5 such, the return requirements of debt and equity investors, which is
6 shaped by expected risk and return, is paramount in attracting
7 capital.

8 It is widely recognized that a public utility should be allowed a rate
9 of return on capital that will allow the utility, under prudent
10 management, to attract capital under the criteria or standards
11 referenced by the *Hope* and *Bluefield* decisions. If the allowed rate
12 of return is set too high, consumers are burdened with excessive
13 costs, current investors receive a windfall, and the utility has an
14 incentive to overinvest. Likewise, customers will be charged prices
15 that are greater than the true economic costs of providing these
16 services. Consumers will consume too few of these services from a
17 point of view of efficient resource allocation. If the return is set too
18 low, then the utility stockholders will suffer because a declining
19 value of the underlying property will be reflected in a declining value
20 of the utility's equity shares. This could happen because the utility
21 would not be earning enough to maintain and expand its facilities to
22 meet customer demand for service, cover its operating costs, and
23 attract capital on reasonable terms. Lenders will shy away from the

1 company because of increased risk that the utility will default on its
2 debt obligations. Because a public utility is capital intensive, the
3 cost of capital is a very large part of its overall revenue requirement
4 and is a crucial issue for a company and its ratepayers.

5 The *Hope* and *Bluefield* standards are embodied in N.C. Gen. Stat.
6 § 62-133(b)(4), which requires that the allowed rate of return be
7 sufficient to enable a utility by sound management

8 to produce a fair return for its shareholders,
9 considering changing economic conditions and other
10 factors . . . to maintain its facilities and services in
11 accordance with the reasonable requirements of its
12 customers in the territory covered by its franchise, and
13 to compete in the market for capital funds on terms
14 that are reasonable and are fair to its customers and
15 to its existing investors.

16 In *State ex rel. Utils. Comm'n v. Cooper*, 366 N.C. 484, 739 S.E.2d
17 541 (2013) (*Cooper*), the North Carolina Supreme Court reversed
18 and remanded the Commission's Order in Docket No. E-7, Sub
19 989, approving a stipulated return on equity of 10.50% for Duke
20 Energy Carolinas, LLC. In its decision, the North Carolina Supreme
21 Court held that (1) the 10.50% return on equity was not supported
22 by the Commission's own independent findings and analysis as
23 required by *State ex rel. Utils. Comm'n v. Carolina Util. Customers*
24 *Ass'n*, 348 N.C. 452, 500 S.E.2d 693 (1988) (*CUCA I*), in cases
25 involving nonunanimous stipulations, and (2) the Commission must
26 make findings of fact regarding the impact of changing economic

1 conditions on consumers when determining the proper return on
2 equity for a public utility. In *Cooper*, however, the Court's holding
3 introduced a new factor to be considered by the Commission
4 regardless of whether there is a stipulation.

5 In considering this new element, the Commission is guided by
6 ratemaking principles laid down by statute and interpreted by a
7 body of North Carolina case law developed over many years.
8 According to these principles, the test of a fair rate of return is a
9 return on equity that will provide a utility, by sound management,
10 the opportunity to (1) produce a fair profit for its shareholders in
11 view of current economic conditions, (2) maintain its facilities and
12 service, and (3) compete in the marketplace for capital. *State ex rel.*
13 *Utils. Comm'n v. General Tel. Co.*, 281 N.C. 318, 370, 189 S.E.2d
14 705, 738 (1972). Rates should be set as low as reasonably
15 possible consistent with constitutional constraints. *State ex rel.*
16 *Utils. Comm'n v. Pub. Staff-North Carolina Utilities Com.*, 323 N.C.
17 481, 490, 374 S.E.2d 361, 366 (1988). The exercise of subjective
18 judgment is a necessary part of setting an appropriate return on
19 equity. *Id.* Thus, in a particular case, the Commission must strike a
20 balance that (1) avoids setting a return so low that it impairs the
21 utility's ability to attract capital, (2) avoids setting a return any
22 higher than needed to raise capital on reasonable terms, and (3)

1 considers the impact of changing economic conditions on
2 consumers.

3 **Q. WHAT IS A FAIR RATE OF RETURN?**

4 A. The fair rate of return is simply a percentage which, when multiplied
5 by a utility's rate base investment, will yield the dollars of net
6 operating income a utility should reasonably have the opportunity to
7 earn. This dollar amount of net operating income is available to pay
8 the interest cost on a utility's debt capital and a return to the
9 common equity investor. The fair rate of return multiplied by the
10 utility's rate base yields the dollars a utility needs to recover in order
11 to earn the investor-required rate of return or cost of capital.

12 **Q. HOW DID YOU DETERMINE THE FAIR RATE OF RETURN THAT**
13 **YOU RECOMMEND IN THIS PROCEEDING?**

14 A. To determine the fair rate of return, I performed a cost of capital
15 study consisting of three steps. First, I determined the appropriate
16 capital structure for ratemaking purposes (i.e., the proper
17 proportions of each form of capital). Utilities normally finance assets
18 with debt and common equity. Because each of these forms of
19 capital have different costs, especially after income tax
20 considerations, the relative amounts of each form employed to
21 finance the assets can have a significant influence on the overall
22 cost of capital, revenue requirements, and rates. Thus, the

1 determination of the appropriate capital structure for ratemaking
2 purposes is important to the utility and to ratepayers. Second, I
3 determined the cost rate of each form of capital. The individual debt
4 issues have contractual agreements explicitly stating the cost of
5 each issue. The embedded annual cost of debt is calculated by
6 considering these agreements and the utility's books and records
7 over the life of the bond. The cost of common equity is more difficult
8 to determine because it is based on the investor's opportunity cost
9 of capital, and there are no defined terms associated with the
10 investment. Various economic and financial models or methods are
11 available to measure the cost of common equity. Third, by
12 combining the appropriate capital structure ratios for ratemaking
13 purposes with the associated cost rates, I calculated an overall
14 weighted cost of capital or fair rate of return.

15 **II. CURRENT FINANCIAL MARKET CONDITIONS**

16 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**
17 **CONDITIONS?**

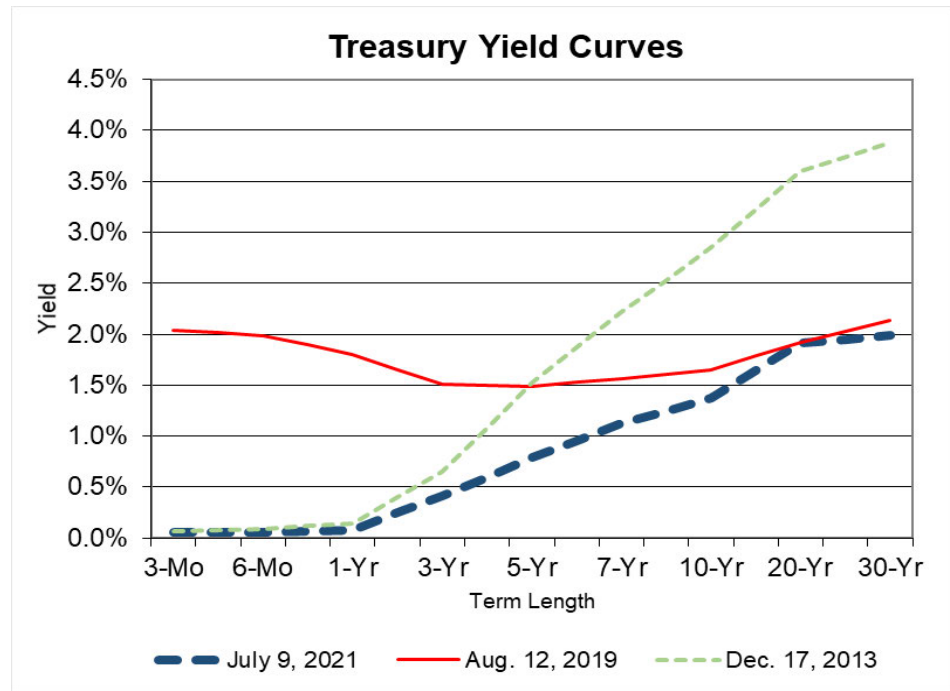
18 A. Yes. The cost of financing is much lower today than in the more
19 inflationary period of the 1990s and the cost of debt capital has
20 stayed approximately the same since Piedmont's last rate case in
21 2019. According to Moody's Bond Survey, the yield on long-term "A"
22 rated public utility bonds, as of July 2021, is 2.95% as compared to

1 3.69% observed for month-ending July 2019 (when the Public Staff
2 was in settlement discussions with Piedmont in Docket No. G-9, Sub
3 743). The month-ending yields on A-rated utility bonds dipped to
4 3.29% in August 2019, averaged 3.15% for the first quarter of 2021,
5 and averaged 3.26% for the second quarter of 2021. This suggests
6 that the cost of debt capital is slightly lower than it was at the time of
7 Piedmont's last general rate proceeding.

8 More recently, observed annual inflation rates have increased; the
9 overall PCE Index (Personal Consumption Expenditure Index)
10 jumped to 4.0% in June 2021 from 1.6 in February 2021. There have
11 been similar increases in the CPI-U (Consumer Price Index –
12 Urban). A key question today is whether these recent increases in
13 inflation are predictors of future inflationary trends or temporary price
14 changes caused by pent-up consumer demand and bottlenecks in
15 the supply chain.¹ At this time, contemporaneous increases have yet
16 to transpire in the utility bond market, as the increases in yields have
17 been moderated as illustrated in Hinton Exhibit I. A-rated utility bond
18 yields have fallen by 49 basis points from their high of 3.44% in
19 March to 2.95% in July. Since the Company's last general rate case
20 in 2019 and, especially since the Company's 2013 rate case, there

¹ Alan S. Binder, "Don't Worry Too Much About the Inflation Surge," Wall Street Journal, July 7, 2021.

1 have been declines in the long-end and short-end of the yield curve
 2 shown below.²



3

4 **Q. DID YOU RELY ON INTEREST RATE FORECASTS IN YOUR**
 5 **INVESTIGATION?**

6 A. No. While I believe forecasts of earnings and dividends influence
 7 investor behavior, I generally do not believe interest rate forecasts to
 8 be reliable in determining the cost of equity. Rather, I believe that
 9 current interest rates, especially in relation to yields on long-term
 10 bonds, are more appropriate for ratemaking. This is because it is
 11 reasonable to expect that as investors are pricing bonds they are
 12 basing their expected inflation-adjusted return on current interest

² Federal Reserve, H15 Selected Interest Rates. <https://www.federalreserve.gov/releases/h15/>

1 rates and future inflationary expectations among other factors. To
2 suggest the current bond yields do not reflect expectations of future
3 interest rate levels suggests that investors do not utilize projections
4 of future interest rates in their decision making or that the bond
5 market is not efficient. I do not think either position is true.

6 While I am confident in the market's ability to reasonably weight
7 forecasts of future interest rates, I am less confident in the use of
8 interest rate forecasts for utility rate cases because I have seen
9 numerous interest rate forecasts that do not materialize as expected.

10 An example of this is the reliance, in part, of cost of capital witness
11 Hevert in Duke Energy Carolinas' 2013 rate case, Docket No. E-7,
12 Sub 1026, relied upon predicted 30-year treasury yields published by
13 Blue Chip Financial Forecasts³ for his CAPM and Risk Premium
14 analyses. The December 1, 2012 Blue Chip Financial Forecasts
15 predicted that the average 30-year treasury yields would rise to 5.5%
16 by 2018. However, this long-term forecast was over 200 basis points
17 higher than the actual average 30-year treasury yields observed for
18 2018. In the 2017 rate case of Duke Energy Carolinas, Docket No.
19 E-7, Sub 1146, witness Hevert used projected 30-year treasuries
20 with a yield of 3.40%.⁴ However, while the forecast errors associated

³ Company response to Public Staff Data Request Number 36-13. The source of the forecast is noted Tr. vol. 2, 85, Docket No. E-7, Sub 1026, pp. 85-86.

⁴ See Order Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction, *Application of Duke Energy Carolinas, LLC, for Adjustment of Rates and Charges Applicable to Electric Utility Service in North Carolina*, Docket No. E-7, Sub

1 with these projected 30-year treasury securities were smaller, this
2 predicted yield for 2019 was still over 140 basis points larger than
3 the actual yields observed in 2019.

4 Another example is the interest rate prediction of Aqua North
5 Carolina, Inc.'s (Aqua) rate of return witness Pauline Ahern in the
6 2013 Aqua rate case, Docket No. W-218, Sub 363.⁵ Ms. Ahern
7 testified to several forecasts of 30-year Treasury bond yields that
8 were predicted to rise to 4.3% in 2015, 4.7% in 2016, 5.2% in 2017,
9 and 5.5% for 2020-2024.⁶ As illustrated in the graph below, these
10 forecasts significantly over-estimated the actual interest rates for 30-
11 year Treasury bonds.

1146, at 39, (N.C.U.C. June 22, 2018), reversed on other grounds, *State ex rel. Utils. Comm'n v. Stein*, 375 N.C. 870, 851 S.E.2d 237 (2020).

⁵ In 2013, Ms. Ahern was a Principal with AUS Consultants. She is currently Executive Advisor at ScottMadden, Inc., the same firm as Piedmont witness D'Ascendis.

⁶ T vol. 2, 13-14, Docket No. W-218, Sub 363.



1 In addition, the tendency of economists to make poor interest rate
 2 predictions in the last ten years was addressed in a December 14,
 3 2019 Wall Street Journal article entitled, “Economists Got the
 4 Decade All Wrong. They’re Trying to Figure Out Why”, and attached
 5 as Hinton Exhibit 2. The foregoing examples illustrate why I tend to
 6 place more weight in current market interest rates that are inherently
 7 forward looking as they reflect investor expectations of both current
 8 and future returns on bonds, and to an extent, future rates of
 9 inflation.

10 **III. APPROPRIATE CAPITAL STRUCTURE AND COST OF DEBT**

11 **Q. WHAT IS CAPITAL STRUCTURE AND HOW IS IT APPROVED**
 12 **FOR RATEMAKING PURPOSES AFFECTS RATES?**

1 A. Typically, a local distribution company (LDC) obtains external capital
2 from investors by borrowing debt and issuing common equity.
3 However, Piedmont obtains its equity capital from its parent
4 company Duke Energy Corporation (Duke Energy). The capital
5 structure is simply a representation of how a utility's assets are
6 financed. It is the relative proportions or ratios of debt and common
7 equity to the total of these forms of capital.

8 Debt and equity capital have different costs. Common equity is far
9 more expensive than debt for ratemaking purposes for two reasons.
10 First, as mentioned earlier, there are income tax considerations.
11 Interest on debt is deductible for purposes of calculating income
12 taxes. The cost of common equity, on the other hand, must be
13 "grossed up" to allow the utility sufficient revenue to pay income
14 taxes and to earn its cost of common equity on a net or after-tax
15 basis. Therefore, the amount of revenue the utility must collect from
16 ratepayers to meet income tax obligations is directly related to both
17 the common equity ratio in the capital structure and cost of
18 common equity. A second reason for this cost difference is that the
19 cost of common equity must be set at a marginal or current cost
20 rate. Conversely, the cost of long-term debt is set at an embedded
21 rate because the utility is incurring costs that are previously
22 established in contracts with security holders.

1 Because the Commission has the duty to promote economical
2 utility service, it must decide whether or not a utility's requested
3 capital structure is appropriate for ratemaking purposes. An
4 example of the cost difference between debt and equity can be
5 seen in the Company's filing. Based upon the Company's
6 requested capital cost rates, each dollar of its common equity and
7 each dollar of its long-term debt that supports the retail rate base
8 have the following approximate annual costs (including income tax
9 and regulatory fee expense) to ratepayers: each dollar of common
10 equity costs ratepayers approximately 12 cents; and each dollar of
11 long-term debt costs ratepayers approximately four cents.

12 Because of the capital cost differences, an appropriate capital
13 structure for ratemaking purposes should be fair to both ratepayers
14 and the utility's debt and equity investors. An appropriate capital
15 structure should contain balances of debt and equity that provide
16 capital cost and income tax savings without a corresponding
17 increase in the overall cost of capital due to the increased financial
18 risk. Therefore, a concern with the Company's capital structure is
19 that the debt and equity ratios adopted in determining the overall rate
20 of return on rate base investment should be no greater than required
21 to allow Piedmont to qualify for reasonable credit ratings and to
22 provide the ability to attract capital.

1 **Q. WHY IS THE APPROPRIATE CAPITAL STRUCTURE**
2 **IMPORTANT FOR RATEMAKING PURPOSES?**

3 A. For companies that do not have monopoly power, the price that an
4 individual company charges for its products or services is set in a
5 competitive market, and that price is generally not influenced by the
6 company's capital structure. However, the capital structure that is
7 determined to be appropriate for a regulated public utility, which has
8 a monopoly, has a direct bearing on the fair rate of return and
9 revenue requirement, and the prices charged to captive ratepayers.

10 **Q. WHAT CAPITAL STRUCTURE HAS THE COMPANY**
11 **REQUESTED IN THIS CASE?**

12 A. Company witness Newlin proposes the use of a hypothetical capital
13 structure of 47.45% long-term debt, 0.55% short-term debt, and
14 52.00% common equity as shown on Exhibit KWN-1 of the
15 Company's Application. Witness Newlin's proposal is derived by
16 averaging the actual capital structure as of December 31, 2020,
17 with three projected capital structures as of March 31, 2021,
18 December 31, 2021, and December 31, 2022.

19 **Q. DO YOU SUPPORT THE HYPOTHETICAL CAPITAL**
20 **STRUCTURE PROPOSED BY COMPANY WITNESS NEWLIN?**

21 A. No. I have concerns with the heavy reliance on projected balances
22 of debt and equity capital, as compared to the traditional use of a

1 historical test year capital structure. Furthermore, I am concerned
 2 that the use of a 52.00% common equity ratio and 48.00% debt
 3 ratio (combined long-term debt and short-term debt ratios) provides
 4 an excessive percentage of equity that is not necessary to maintain
 5 the Company's credit ratings, and is not reflective of Piedmont's
 6 historical capitalization ratio. As of March 31, 2021, Moody's
 7 creditworthiness metric, Cash Flow from Operations (pre-working
 8 capital) divided by Piedmont's Debt yielded a **[BEGIN**
 9 **CONFIDENTIAL]** [REDACTED] **[END CONFIDENTIAL]** times, which is in
 10 alignment with Moody's expectations. Shown below are Moody's
 11 calculations of the Cash Flow metric and the Debt to Book
 12 Capitalization metric for Piedmont, both of which include the
 13 Company's long-term and short-term debt balances.

14 **[BEGIN CONFIDENTIAL]**

Moody's Financial Scorecard	Cash Flow from Operations / Debt	Debt / Book Capitalization
Mar. 31, 2021	[REDACTED] times	[REDACTED]%
Dec. 31, 2020	[REDACTED] times	[REDACTED]%
Dec. 31, 2019	[REDACTED] times	[REDACTED]%
Dec. 31, 2018	[REDACTED] times	[REDACTED]%

15

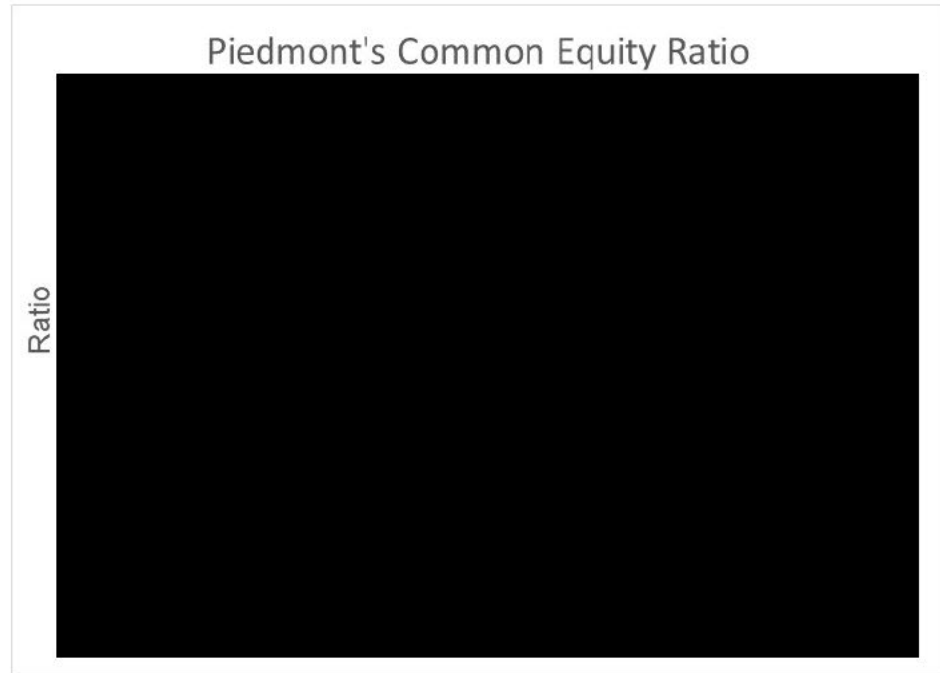
16 **[END CONFIDENTIAL]**

1 The fact that Piedmont's average Cash Flow metric is above
2 **[BEGIN CONFIDENTIAL] ■ ■■■ [END CONFIDENTIAL]**
3 suggests that Piedmont does not require a 52.00% common equity
4 ratio in order to maintain its "A3" credit rating with a "Stable" outlook
5 as indicated by Hinton Exhibit 3, the most current Moody's
6 Investors Service report for Piedmont. Included in Exhibit 3, is a
7 February 9, 2021 credit ratings report by S&P Global Ratings on the
8 Company, which assigns an Issuer Credit Rating of BBB+.

9 Shown below is a graph of Piedmont's common equity ratio since
10 its merger with Duke Energy in October 2016. The graph illustrates
11 that the Company's average balance of equity has hovered around
12 **[BEGIN CONFIDENTIAL] ■■■ [END CONFIDENTIAL]** which is
13 very close to the 13-month test year average common equity ratio.

1

[BEGIN CONFIDENTIAL]



2

3

[END CONFIDENTIAL]

4 **Q. WHAT APPROACH DO YOU RECOMMEND TO DETERMINE A**
5 **REPRESENTATIVE AND REASONABLE CAPITAL**
6 **STRUCTURE?**

7 A. I recommend a capital structure for ratemaking purposes based on
8 a 13-month historical average of long-term debt, short-term debt,
9 and common equity, as opposed to using projected capital structure
10 as proposed by Company witness Newlin. More specifically, to
11 determine the capital structure, I averaged common equity, long-
12 term debt, and short-term debt balances as of May 31, 2020,
13 through May 31, 2021.

1 Q. WHAT CAPITAL STRUCTURE DO YOU RECOMMEND THE
2 COMMISSION EMPLOY FOR RATE MAKING PURPOSES?

3 A. As shown on Page 1 of Hinton Exhibit 4, I recommend that the
4 following capital structure be employed for ratemaking purposes in
5 this proceeding:

6 Piedmont Natural Gas Capital Structure
7 Thirteen-Month Average as of May 31, 2021
8 (\$1,000)

9	Capital Item	Amount	Ratios
10	Long-Term Debt	\$ 2,707,488	48.81%
11	Short-Term Debt	37,199	0.65%
12	<u>Common Equity</u>	<u>2,803,794</u>	<u>50.54%</u>
13	Total Capital	\$ 4,248,617	100.00%

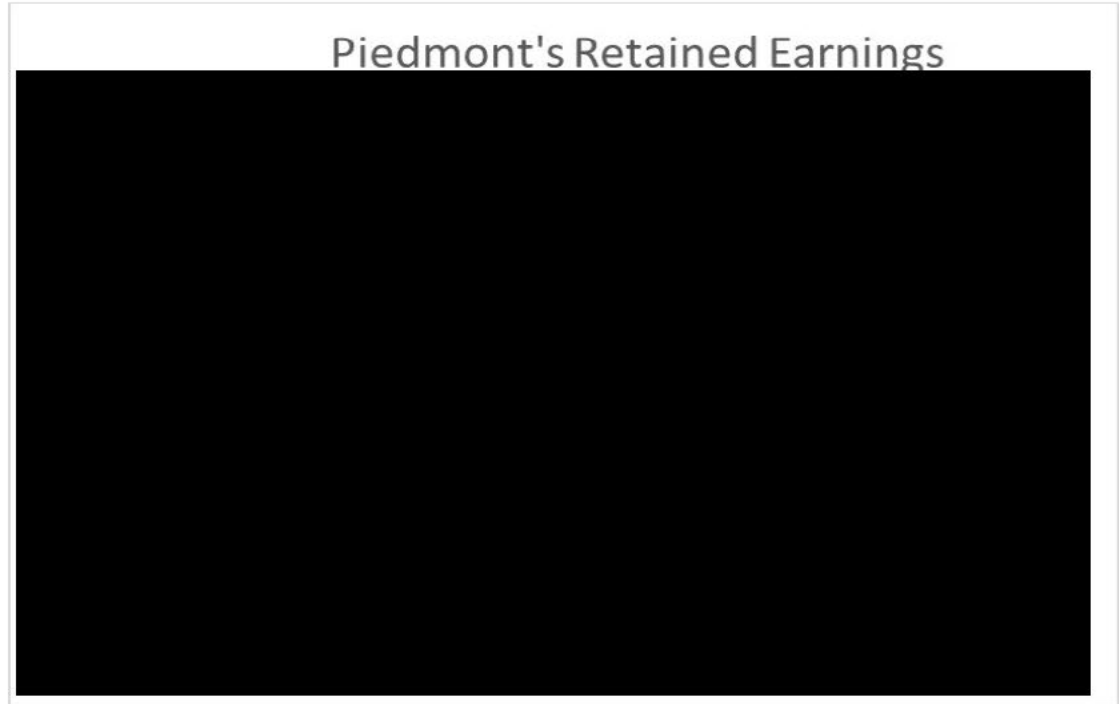
14 Confidential Page 2 of Exhibit 4 presents the underlying capital
15 account balances, the test year balance of long-term debt which is
16 comprised of the outstanding long-term debt of **[BEGIN**
17 **CONFIDENTIAL]** [REDACTED] **[END CONFIDENTIAL]** minus
18 the balance for the unamortized debt issuance expense throughout
19 the 13-month period from May 31, 2020, through May 31, 2021. It is
20 noteworthy that the balance of long-term debt includes an
21 additional **[BEGIN CONFIDENTIAL]** [REDACTED]
22 [REDACTED] **[END CONFIDENTIAL]**.

23 Hinton Exhibit 4 presents the account balances that comprise
24 common equity. The Commission should note the **[BEGIN**
25 **CONFIDENTIAL]** [REDACTED] **[END CONFIDENTIAL]** of the

1 Company's retained earnings: from [BEGIN CONFIDENTIAL]
2 [REDACTED] [END CONFIDENTIAL] for month-ending May
3 2020, [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL]
4 to [BEGIN CONFIDENTIAL] [REDACTED] [END
5 CONFIDENTIAL] for May 2021. The Company's compound annual
6 average growth in retained earnings over the past four years (Dec.
7 2016-Dec. 2020) has been approximately [BEGIN
8 CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL] as compared to a
9 pre-merger growth rate of [BEGIN CONFIDENTIAL] [REDACTED] [END
10 CONFIDENTIAL] over the four years (Dec. 2011-Dec. 2015) prior
11 to the merger as shown below. It should be noted that the growth in
12 retained earnings is partially explained by the absence of any
13 dividends being paid to Duke Energy.

1

[BEGIN CONFIDENTIAL]



2

3

[END CONFIDENTIAL]

4

Piedmont's other comprehensive income played a relatively small role in the test year balance of common equity. The balance of the Company's paid in capital of includes a [BEGIN CONFIDENTIAL]

5

6

[REDACTED] [END

7

CONFIDENTIAL]. Piedmont's capital structure is similar to that observed in the 2019 rate case, Docket No. G-9, Sub 743, where an issuance of long-term debt included a contemporaneous infusion of common equity.

8

9

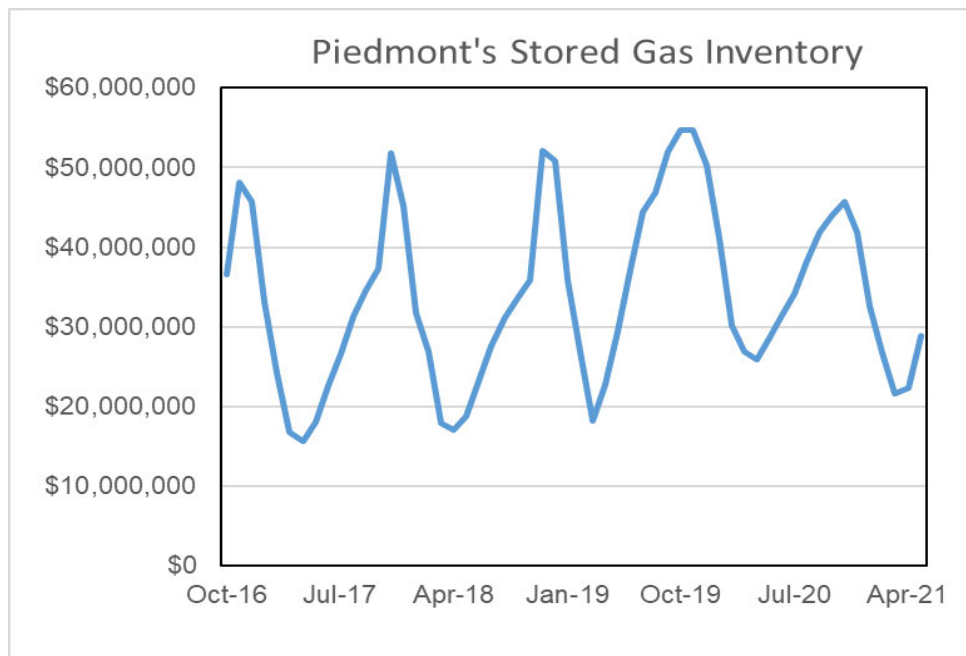
10

To determine the appropriate balance of short-term debt, I

11

recommend it be set at the Public Staff's recommended dollar value

1 of stored gas inventory⁷ to be included in rate base of
 2 \$36,227,098.⁸ The graph below shows the seasonality of
 3 Piedmont's gas inventory. Since short-term debt finances gas
 4 inventory, matching the amount of short-term debt included in the
 5 capital structure to the gas inventory in the rate base establishes a
 6 reasonable amount of short-term debt for ratemaking purposes.
 7 Furthermore, this approach better aligns the actual financing cost of
 8 the gas inventory in rate base.



9

⁷ This use of gas inventory as a proxy for short-term debt was upheld by the North Carolina Supreme Court in *State ex rel. Utilities Comm'n v. Carolina Util. Customers Ass'n*, 351 N.C. 223, 524 S.E.2d 10 (2000).

⁸ As recommended by Public Staff witness Feasel, Exhibit I, Schedule 2-2.

1 **Q. WHAT ARE YOUR RECOMMENDED COST RATES OF**
2 **LONG-TERM AND SHORT-TERM DEBT?**

3 A. I recommend the use of the Company's updated 4.08% cost rate of
4 long-term debt as of May 31, 2021, and a 0.20% cost rate of short-
5 term debt. The short-term cost is based on the 13-month average
6 spread between the prime rate and the Company's cost of short-
7 term debt over the 13 months ending May 31, 2021, producing an
8 average spread of 305 basis points. I then deducted 305 basis
9 points from the current 3.25% prime rate to produce the 0.20% cost
10 rate of short-term debt.

11 **IV. COST OF COMMON EQUITY CAPITAL**

12 **Q. HOW DO YOU DEFINE THE COST OF COMMON EQUITY**
13 **CAPITAL?**

14 A. The cost of equity capital for a firm is the expected rate of return on
15 common equity that investors require in order to induce them to
16 purchase shares of the firm's common stock. The return is
17 expected or forward-looking because the investor buys a share of
18 the firm's common stock and does not know with certainty what his
19 returns will be in the future. Furthermore, the cost of capital reflects
20 opportunity costs; in that the investor foregoes the opportunity to
21 invest in other comparable risk investments.

1 Q. HOW DID YOU DETERMINE THE COST OF COMMON EQUITY
2 CAPITAL FOR THE COMPANY?

3 A. I used the DCF model and a regression analysis of approved returns
4 for LDCs and diversified gas companies with local distribution
5 utilities to determine the cost of equity. As a check method, I
6 performed a Comparable Earnings Analysis on my group of
7 comparable companies.

8 A. DCF METHOD

9 Q. PLEASE DESCRIBE YOUR DCF ANALYSIS.

10 A. The DCF model is a method of evaluating the expected cash flows
11 from an investment by giving appropriate consideration to the time
12 value of money. The DCF model is based on the theory that the
13 price of the investment will equal the discounted cash flows of
14 returns. The model provides an estimate of the rate of return
15 required to attract common equity financing as a function of the
16 market price of a stock, the company's dividends, and investors'
17 growth expectations. The return to an equity investor comes in the
18 form of expected future dividends and price appreciation. However,
19 as the new price will again be the sum of the discounted cash
20 flows, price appreciation is ignored and attention is instead focused
21 on the expected stream of dividends. Mathematically, this
22 relationship may be expressed as follows:

1 Let D_1 = expected dividends per share over the next twelve
 2 months;

3 g = expected growth rate of dividends;

4 k = cost of equity capital; and

5 P = price of stock or present value of the future income
 6 stream.

7 Then,

$$8 \quad P = \frac{D_1}{1+k} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{t-1}}{(1+k)^t}$$

11 This equation represents the amount an investor would be willing to
 12 pay for a share of common stock with a dividend stream over the
 13 future periods. Using the formula for a sum of an infinite geometric
 14 series, this equation may be reduced to:

$$15 \quad P = \frac{D_1}{k-g}$$

18 Solving for k yields the DCF equation:

$$19 \quad k = \frac{D_1 + g}{P}$$

22 Therefore, the rate of return on equity capital required by investors
 23 is the sum of the dividend yield (D_1/P) plus the expected long-term
 24 growth rate in dividends (g).

1 **Q. HOW DID YOU APPLY THE DCF MODEL TO DETERMINE**
2 **THE COST OF EQUITY?**

3 A. Since Piedmont is a wholly owned subsidiary of Duke Energy, the
4 Company does not have any publicly traded stock. Therefore, there
5 is no explicit market information to show what investors would pay
6 for the stock. For this reason, I could not apply the DCF method
7 directly to Piedmont. However, the cost of equity capital is not
8 unique to any particular firm. Rather, it is a cost shared by firms
9 whose equity shares are considered by investors to be risk-
10 comparable investments. In order to estimate the required rate of
11 return, I have identified a group of comparable companies whose
12 market information indicates the required investor return for
13 Piedmont.

14 **Q. HOW DID YOU IDENTIFY COMPANIES COMPARABLE IN RISK**
15 **TO PIEDMONT?**

16 A. I began my analysis by reviewing ten companies that are identified by
17 the Value Line Investment Survey Standard Edition (Value Line) as
18 the Natural Gas Company industry group. From this group of
19 companies, I eliminated Nisource, Inc., due to a dividend cut in 2015. I
20 then reviewed the diversified natural gas companies followed by
21 Value Line and found two companies that had were identified as
22 having distribution operations.

1 Q. WHAT MEASURES OF RISK DID YOU REVIEW TO
2 DETERMINE THE COMPARABILITY OF INVESTING IN
3 PIEDMONT WITH INVESTING IN OTHER NATURAL GAS
4 DISTRIBUTION UTILITIES?

5 A. I reviewed standard risk measures that are widely available to
6 investors that are considered by most investors when making
7 investment decisions. The beta coefficient is a measure of the
8 sensitivity of a stock's price to overall fluctuations in the market.
9 The Value Line beta coefficient describes the relationship of a
10 company's stock price with the New York Stock Exchange
11 Composite. A beta value of less than 1.0 means that the stock's
12 price is less volatile than the movement in the market;
13 conversely, a beta value greater than 1.0 indicates that the
14 stock price is more volatile than the market.

15 I reviewed the Value Line Safety Rank, which measures the
16 total risk of a stock. The Safety Rank is calculated by averaging
17 two variables: (1) the stock's index of price stability, and (2) the
18 Financial Strength rating of the company.

19 I also reviewed the S&P and Moody's bond ratings, which are
20 assessments of the creditworthiness of a company. Credit rating
21 agencies focus on the creditworthiness of the particular bond
22 issuer, which includes a detailed and thorough review of the

1 potential areas of business risk and financial risk of the
2 company. These and other risk measures I reviewed are shown
3 in Hinton Exhibit 5, and are further explained in Appendix B to
4 my testimony.

5 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD**
6 **COMPONENT OF THE DCF?**

7 A. I calculated the dividend yield by using the Value Line estimate of
8 dividends to be declared over the next 12 months, divided by the
9 price of the stock as reported in the Value Line Summary and Index
10 for each week of the 13-week period from April 30, 2021, through
11 July 23, 2021. A 13-week averaging period tends to smooth out
12 short-term variations in the stock prices. This process resulted in an
13 average dividend yield of 3.2% for the comparable group of LDCs.

14 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**
15 **COMPONENT OF THE DCF?**

16 A. I employed the growth rates of the comparable group in earnings
17 per share (EPS), dividend per share (DPS), and book value per
18 share (BPS) as reported in Value Line over the past five and ten
19 years. I also employed forecasts of future growth rates as reported
20 in Value Line. The historical and forecasted growth rates are
21 prepared by analysts of an independent advisory service widely
22 available to investors and they should also provide an estimate of

1 investor expectations. I included both historical, known growth rates
2 and forecasted growth rates, because it is reasonable to expect
3 that investors consider both sets of data in determining their
4 expectations. I should note that, in calculating an average or
5 median growth rate, I did not include negative historical growth
6 rates in EPS, DPS, and BPS. This is because that while negative
7 growth rates are possible, they are generally not the basis for
8 investor expectations with utility investing.

9 Finally, I incorporated the consensus of various analysts' forecasts
10 of five-year EPS growth rate projections as reported in Yahoo
11 Finance. The dividend yields and growth rates for each of the
12 companies and for the average for the comparable group are
13 shown in Hinton Exhibit 6.

14 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COST OF**
15 **COMMON EQUITY TO THE COMPANY BASED ON THE DCF**
16 **METHOD?**

17 A. Based on my DCF analysis, I determined that a reasonable
18 expected dividend yield is 3.2% with an expected growth rate of
19 5.9% to 6.5%. As such, the analysis produces a cost of common
20 equity for the comparable group of LDCs of 9.1% to 9.7%.

1

B. REGRESSION ANALYSIS METHOD

2

Q. PLEASE DESCRIBE YOUR REGRESSION ANALYSIS METHOD.

3

A. I used a regression analysis to analyze the relationship between approved returns on equity for LDCs and Moody's Bond Yields for A-rated utility bonds, which is a form of the equity risk premium method that examines the risk premium associated with higher-risk investments. The differential between the two rates of return is indicative of the return investors require in order to compensate them for the additional risk. This method considers the return premium associated with an investment in a company's common stock over an investment in a company's bonds.

12

A strength of this approach is that authorized returns on equity are generally arrived at through lengthy investigations by various parties with opposing views on the rate of return required by investors. Thus, it is reasonable to conclude that the approved returns are good estimates for the cost of equity. The next step is to incorporate a contemporaneous cost of debt. I then use an ordinary least-squares regression model⁹ that can be performed with spreadsheets that have basic statistical functionality.

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⁹ The least squares model is a form of mathematical regression analysis that finds the line of best fit that quantifies the relationship between an independent variable(s) and a dependent variable.

1 Q. PLEASE DESCRIBE HOW YOU APPLIED A REGRESSION
2 ANALYSIS TO APPROVED RETURNS ON EQUITY WITH
3 NATURAL GAS UTILITY RATE CASES.

4 A. The method I used relies on approved returns on common equity
5 for natural gas utility companies from various public utility
6 commissions that are published by the Regulatory Research
7 Associates, Inc. (RRA), with S&P Global Market Intelligence and
8 Moody's "A" rated Utility Bond Yields as shown on Page 1 of Hinton
9 Exhibit 7. The Commission relied on this method in Docket No. G-5,
10 Sub 327, a 1994 general rate case of Public Service Company of
11 North Carolina, Inc.¹⁰ The results from the regression analysis in this
12 study and in other studies indicate that there is a high correlation
13 between the cost of equity and utility bond yields.¹¹

14 Q. WHAT WERE THE RESULTS OF YOUR REGRESSION
15 ANALYSIS?

16 A. The results of the regression analysis indicate that the predicted
17 cost of equity is 9.50% as shown on Page 2 of Hinton Exhibit 7. As
18 noted, a statistical regression was performed in order to quantify
19 the relationship of allowed equity returns and bond costs. The

¹⁰ The regression analysis method is also used in the formula rate plans for LDCs regulated by the Mississippi Public Service Commission. See Mississippi Public Service Commission, Mississippi Gas Co., Docket No. 18-UN-0139, Atmos Energy Corporation, Docket No. 05-UN-0503.

¹¹ See Brigham, E., Shome, D., and Vinson, S., 1985. "The Risk Premium Approach to Measuring a Utility's Cost of Equity." Financial Management, Spring 14: 33-45.

1 results of the regression analysis indicate a significant statistical
2 relationship between the approved equity returns and bond costs
3 such that a reduction of 10 basis points in yields corresponds to a
4 decrease of three basis points in return on equity (ROE).¹²
5 Therefore, the regression analysis allows the historical relationship
6 of approved returns on equity and bond yields from 2007 through
7 2021 to be quantified, and then combined with six months of recent
8 yields to derive a predicted 9.50% cost rate for common equity.

9 **C. COMPARABLE EARNINGS METHOD**

10 **Q. PLEASE DESCRIBE YOUR COMPARABLE EARNINGS**
11 **ANALYSIS THAT YOU USE AS A CHECK.**

12 A. My comparable earnings method analysis involves reviewing earned
13 returns on equity for my comparable group of natural gas utilities.
14 This approach is based on the decision in the *Hope* case cited earlier
15 in my testimony, which maintains that an investor should be able to
16 earn a return comparable to the returns available on alternative
17 investments with similar risks.

¹² The regression equation $ROE = 0.079857 + 0.40336$, indicates a significant statistical relationship between Moody's utility bond yields and approved ROEs with an adjusted $R^2 = 0.90860$.

1 **Q. WHAT ARE SOME OF THE STRENGTHS AND**
2 **WEAKNESSES INHERENT IN THE COMPARABLE EARNINGS**
3 **METHOD?**

4 A. A strength of this method is that information on earned returns on
5 common equity is widely available to investors and it is believed that
6 investors use actual earned returns as a guide in determining their
7 expected return on an investment. A weakness is that the earned
8 return on equity may include non-utility income and increased
9 earnings resulting from deferred income taxes. Furthermore, actual
10 earned rates of return on equity can be impacted by factors outside a
11 company's control, such as with weather and inflation. These
12 unforeseen developments can cause a company's earned rate of
13 return on equity to exceed or fall short of its cost of capital during any
14 certain period, which tends to make this method less reliable than
15 other cost of capital methods. For this reason, I use the results of this
16 method as a check on the results of my DCF analysis and Regression
17 Method.

18 **Q. HOW DID YOU APPLY THE COMPARABLE EARNINGS**
19 **METHOD?**

20 A. I examined the historical earned returns and near-term predicted
21 returns of my comparable group of LDCs as reported in Value Line,
22 as shown in Hinton Exhibit 8.

1 Q. WHAT DID YOU CONCLUDE FROM YOUR COMPARABLE
2 EARNINGS ANALYSIS OF THE GROUP OF COMPARABLE
3 NATURAL GAS UTILITIES?

4 A. Based on the earned rates of return, I conclude that the cost of
5 equity using the Comparable Earnings analysis provides a
6 reasonable check on my DCF and Regression Analysis results.
7 Under the Comparable Earnings method, I calculated an average
8 historical earned return of 10.0%, and a median earned return of
9 9.5%. In my opinion, the median calculation is a better measure of
10 central tendency due to the 20.2% earned return by National Fuel
11 Gas and other excessively high earned returns that exceed the
12 Company's cost of common equity. As such, I believe the median
13 earned return of 9.5% is more reflective of investors' expected
14 required returns on equity.

15 Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY BASED ON
16 YOUR OVERALL STUDY?

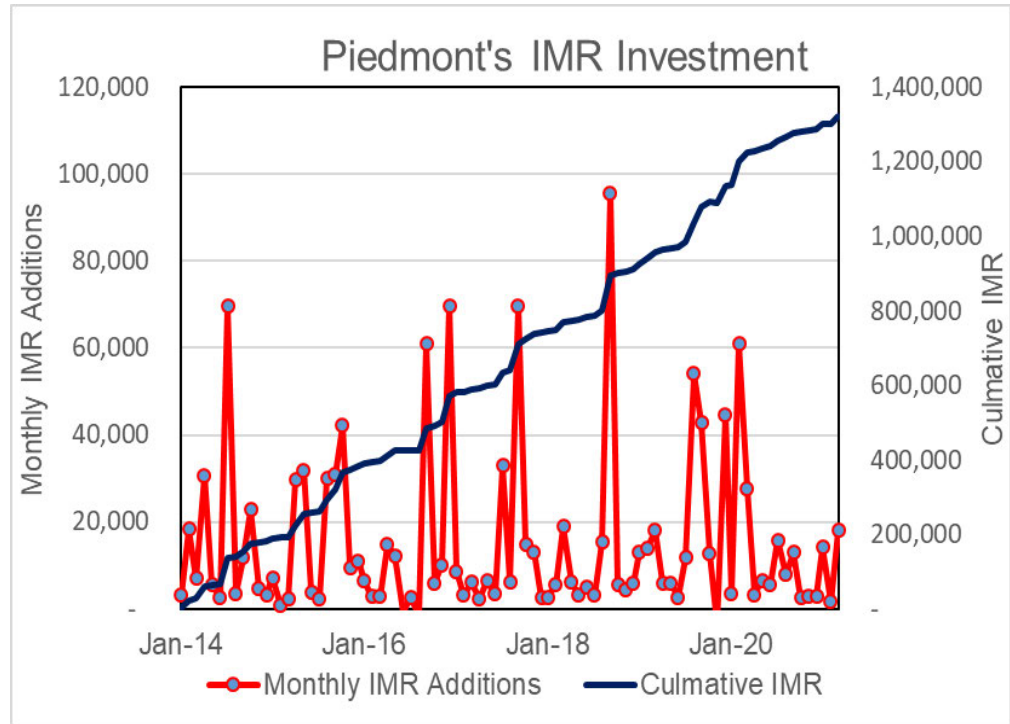
17 A. I recommend a 9.42% cost rate for common equity, as shown in
18 Hinton Exhibit 9, where I average the four results of my two
19 methods. The results of my DCF model produce a cost of equity of
20 9.10% using historical growth rates. If I assume that investors
21 equally weigh historical growth and forecasts, the DCF model
22 produces a 9.35% cost rate of equity. If I assume investors use only
23 predicted growth rates of earnings, dividends, and book value, the

1 DCF model produces a 9.73% cost rate. I combined these results
2 with my Regression Analysis result, a cost of equity of 9.50%, to
3 yield an average cost of equity of 9.42%, which is my
4 recommended cost of common equity for the Company.

5 **Q. WHAT OTHER EVIDENCE DID YOU CONSIDER IN YOUR**
6 **ASSESSMENT OF THE REASONABLENESS OF YOUR**
7 **RECOMMENDED RETURN?**

8 A. In assessing the reasonableness of my recommendation, I
9 considered the pre-tax interest coverage ratio produced by my cost
10 of capital recommendation. Based on the recommended capital
11 structure, cost of debt, and cost of equity, the pre-tax interest
12 coverage ratio is approximately 4.1. This indicator of credit quality
13 suggests that Piedmont has an adequate opportunity to continue to
14 qualify for a single "A" bond rating.

15 My reasonableness assessment also includes acknowledging the
16 continued role that the Integrity Management Rider (IMR) has in
17 reducing regulatory lag, which is seen as a supportive regulatory
18 policy by investors. The graph below shows the additional monthly
19 plant additions associated with the Company's IMR mechanism,
20 which as of March 31, 2021, amounted to approximately \$1.3 billion
21 of additional capital investment since its inception in January 2014.



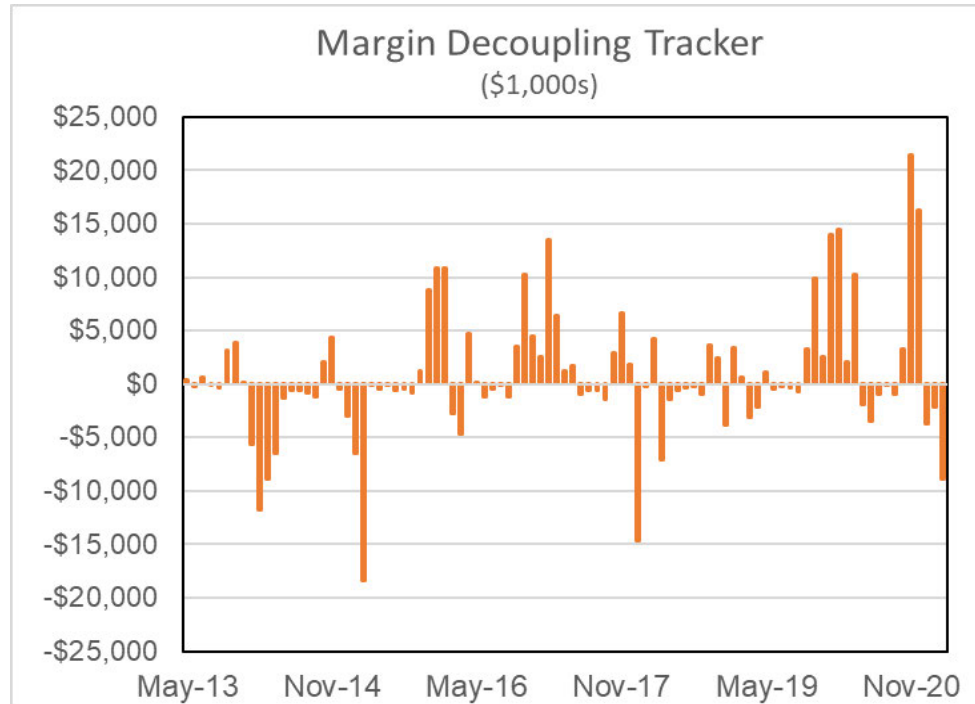
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In addition, I also considered the stabilizing impact on residential and small commercial customers' revenue and on the Company's earnings of the Margin Decoupling Tracker (MDT) that was approved by the Commission in 2008 in Docket No. G-9, Sub 550.^{13,14} In large part, the tracker was approved in light of declining customer usage and as a way to eliminate the Company's disincentive to promote conservation. The Commission's Order noted that the MDT would stabilize the Company's margin recovery and reduce the risk to Piedmont and its customers arising from

¹³ Order Approving Partial Rate Increase and Requiring Conservation Program Filing and Reporting, *In the Matter of Application of Piedmont Natural Gas Company, Inc., for a General Increase in its Rates and Charges*, Docket No. G-9, Sub 550 (N.C.U.C. Oct. 24, 2008) (Sub 550 Order).

¹⁴ The Company had a similar mechanism called the Customer Utilization Tracker (CUT) approved in Docket No. G-9, Sub 499.

1 potential variations in usage patterns.¹⁵ The graph below shows the
 2 historical impact of the revenue adjustments associated with the
 3 MDT. The IMR leads to less regulatory lag, which lessens
 4 Piedmont's financial risk, while the MDT significantly reduces
 5 Piedmont's business risks.



6

7 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
 8 **RETURN ON EQUITY TAKE INTO CONSIDERATION THE**
 9 **IMPACT OF CHANGING ECONOMIC CONDITIONS ON**
 10 **PIEDMONT'S CUSTOMERS?**

11 A. I am aware of no clear numerical basis for quantifying the impact of
 12 changing economic conditions on customers in determining an

¹⁵ See Sub 550 Order, Finding of Fact No. 24, at 18-19. The MDT affects rate schedules 101, 102, and 152.

1 appropriate return on equity in setting rates for a public utility.
2 Rather, the impact of changing economic conditions nationwide is
3 inherent in the methods and data used in my study to determine the
4 cost of equity for utilities that are comparable to Piedmont. I have
5 reviewed certain information on the economic conditions in the
6 areas served by Piedmont, specifically data on the per capita
7 personal income from the Bureau of Economic Analysis (BEA) and
8 the Development Tier Designations published by the North Carolina
9 Department of Commerce for Piedmont's service territory. The BEA
10 data indicates that from 2017 to 2019, per capita total personal
11 income grew at an annual growth rate of 3.3%, which is slightly
12 lower than 3.7% for the whole state. While more current income
13 data by county is not available, the statewide total personal income
14 grew at an 18% annual growth rate as of the first quarter of 2021.¹⁶
15 In addition, North Carolina's unemployment rate has fallen for the
16 ninth consecutive month to 4.6%¹⁷ in June 2021.

17 The North Carolina Department of Commerce annually ranks the
18 State's 100 counties based on economic well-being and assigns
19 each a Tier designation. The most distressed counties are rated a
20 "1," and the most prosperous counties are rated a "3." The rankings
21 examine several economic measures such as household income,

¹⁶ Bureau of Economic Analysis, Table 1, Personal Income by State and Region, 2019: Q4-2021:Q1.

¹⁷ Bureau of Labor Statistics, Economy at a Glance, <https://www.bls.gov/eag/eag.nc.htm#>

1 poverty rates, unemployment rates, population growth, and per
2 capita property tax base. For 2021, the average Tier ranking for
3 North Carolina counties in Piedmont's service territory was 1.7.
4 However, the Tier ranking is in excess of "2" when the counties are
5 weighted by the Company's regional resource centers; such as with
6 the Charlotte Resource Center that serves over one third of the
7 Company's customers.

8 As discussed previously, the Commission's duty is to set rates as
9 low as reasonably possible consistent with constitutional
10 constraints. This duty exists regardless of the customers' ability to
11 pay. Moreover, the rate of return on common equity is only one
12 component of the rates established by the Commission. General
13 Statute § 62-133 sets out an intricate formula for the Commission to
14 follow in determining a utility's overall revenue requirement. It is the
15 combination of rate base, expenses, capital structure, and cost
16 rates for debt and equity capital, that determines how much
17 customers pay for utility service and investors receive in return for
18 their investment. The Commission must exercise its best judgment
19 in balancing the interests of both groups. My analysis of the income
20 data and the tier rankings indicates that economic conditions are
21 not unduly burdensome for Piedmont's customers. As shown in the
22 income and unemployment data, overall economic conditions have
23 significantly improved from the height of the pandemic. While this is

1 applicable to most of the State and Piedmont's customers, it is true
2 that the economic wellbeing of certain customers and related
3 businesses will take years to recover from the COVID-19 pandemic.
4 Nonetheless, I maintain that the recommended rate of return on
5 equity will allow the Company to properly maintain its facilities,
6 provide adequate service to its customers, attract capital on terms
7 that are fair and reasonable to its customers and investors, and
8 result in rates that are just and reasonable.

9 **V. REVIEW OF D'ASCENDIS TESTIMONY**

10 **Q. HAVE YOU REVIEWED COMPANY WITNESS D'ACENDIS'S**
11 **TESTIMONY?**

12 A. Yes. My review indicates that his analyses include several inputs
13 with which I take issue, and which I believe lead to his higher than
14 appropriate recommended rate of return. In particular, I disagree
15 with his exclusive use of forecasted EPS in the DCF model, his
16 estimate of the expected market return, and the market premium
17 used in his CAPM.

18 **Q. WHY DO YOU DISAGREE WITH COMPANY WITNESS**
19 **D'ASCENDIS'S EXCLUSIVE USE OF FORECASTED EPS IN HIS**
20 **DCF ANALYSIS?**

21 A. Company witness D'Ascendis has focused entirely on five-year
22 EPS forecasted growth rates in estimating the long-term expected

1 growth rate in DPS for purposes of his DCF model. He has not
2 given any weight to historical EPS growth rates nor to historical and
3 forecasted DPS and BPS growth rates. While I have given primary
4 weight to forecasted growth rates of EPS, DPS, and BPS, I have
5 also accorded some weight to actual historical performance in my
6 recommendation. Consideration of DPS and BPS, along with EPS,
7 provides a variety of indicative growth measures, as opposed to Mr.
8 D'Ascendis's reliance on only one measure. Given that at least one
9 study has found that analysts' long-term earnings growth forecasts
10 are no more accurate at forecasting future earnings than random
11 walk forecasts of future earnings,¹⁸ and that other studies have
12 found that analyst's earnings forecasts tend to have an upward bias
13 in their projections, I find the premise that investors limit their
14 investment decisions to forecasted growth rates in EPS to be quite
15 questionable. Company witness D'Ascendis's DCF analysis is
16 flawed because investors do not simply ignore the historical
17 performance of stocks. While forecasts are generally based, in part,
18 on a company's historical performance, it is quite a different
19 argument to state that investors rely solely on forecasts of EPS and
20 ignore past performance of dividends and book value.

¹⁸ See Louis K.C. Chan, Jason Karceski, and Josef Lakonishok, "The Level and Persistence of Growth Rates," *Journal of Finance*, April 2003.

1 In prior orders, this Commission has not been persuaded by rate of
2 return witnesses who relied exclusively on forecasted growth rates
3 in their use of the DCF model. In its Order in Docket No. E-22, Sub
4 532, the Commission said, "as stated in previous Commission general
5 rate case orders, [the Commission] does not approve of witness
6 Hevert's sole use of analysts' predicted earnings per share to
7 determine the DCF growth rate.¹⁹ Similarly, in its Order issued on
8 December 30, 2003, in Docket No. P-100, Sub 133d, the
9 Commission said, "The Commission is persuaded that investors
10 consider a company's historical performance along with its
11 forecasts when assessing its long-run growth potential."²⁰ In that
12 proceeding, BellSouth's witness Billingsley gave exclusive weight to
13 security analysts' EPS forecasts compiled by Zacks Investment
14 Research and the Institutional Brokers Estimate System, which is
15 comparable to witness D'Ascendis's use of earnings forecasts. This
16 reliance on only forecasted growth is incorporated into his DCF
17 model and his CAPM's use of a market risk premium that relies on
18 results from his DCF model applied to the companies in the S&P
19 500.

¹⁹ *In the Matter of Application of Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina, Order Accepting Public Staff Stipulation in Part, Accepting CIGFUR Stipulation Deciding Contested Issues, and Granting Partial Rate Increase, (N.C.U.C. February 24, 2020) (appeal filed on other grounds) at 40.*

²⁰ *In the Matter of General Proceeding to Determine Permanent Pricing for Unbundled Network Elements, Order Adopting Permanent Unbundled Network Element Rates for Bellsouth Telecommunications, Inc., Docket No. P-100, Sub 133d (N.C.U.C. Dec. 30, 2003) at 73.*

1 Q. PLEASE EXPLAIN YOUR CONCERNS WITH COMPANY
2 WITNESS D'ASCENDIS'S ESTIMATE OF THE EXPECTED
3 MARKET RISK RETURN AND MARKET PREMIUM
4 INCORPORATED IN HIS CAPM.

5 A. Company witness D'Ascendis's CAPM model based on his Total
6 Market Approach assumes that investors are currently requiring an
7 expected risk premium of 15.47% that is based on an investor
8 expected return on the return of 17.78%, as shown on page 2 of
9 Schedule DWD-4. The 17.78% market estimate is derived using a
10 DCF model applied to each the 500 companies within the S&P 500
11 index. The DCF results are derived with expected dividend yields
12 earnings forecasts from Bloomberg Professional. Then Mr.
13 D'Ascendis weights each of the 500 DCF results by the Company's
14 market capitalization to arrive at 17.78% return on the market. His
15 unweighted mean DCF result for the 500 companies is 13.84% and
16 the median DCF result is 11.03%. A concern relates to the disparity
17 between his weighted average result of 17.78% and the lower
18 unweighted DCF results as well as whether investor expectations
19 are so dramatically influenced by a relative small handful of
20 companies. The DCF results of Tesla Inc., Amazon.com Inc.,
21 Microsoft Corp., Apple, Inc., and Facebook, Inc. account for over
22 41% of his weighted average DCF of 17.78%. If the witness had
23 simply taken the average of the mean and median DCF results as

1 performed in other calculations, his estimated return on the market
2 would generate a 12.43% expected return on the market for his
3 CAPM and ECAPM studies, which is far more reasonable than his
4 weighted DCF based estimate of 17.78%.

5 In my opinion, Company witness D'Ascendis's estimates of the
6 expected returns on the S&P 500 are unrealistic for investors over
7 the long run, which inflates his market premium and his CAPM and
8 ECAPM cost of equity estimates. It is highly unlikely that the growth
9 of the S&P 500 would over the long run exceed the growth of the
10 general economy.²¹ As such, I maintain that Mr. D'Ascendis's
11 expected growth rates for the S&P 500 are unsustainable and his
12 CAPM and ECAPM results that rely on a 17.78% expected return
13 on the market are overstated.

14 **Q. WHAT DO WELL KNOWN INVESTMENT ADVISORS BELIEVE**
15 **THE FUTURE RATES OF RETURNS WILL BE FOR THE S&P**
16 **500?**

17 A. As shown in Hinton Exhibit 10, Christine Benz of Morningstar has
18 collected forecasts of long-term rate of returns on stocks and bonds
19 by BlackRock Investment Institute, as well as investment
20 professionals John Bogle with Vanguard and J.P. Morgan. In
21 general, they expect a departure from history with lower future

²¹ *Id.* at 649.

1 market returns on equity of 5% to 8%. In a recent article shown as
2 Hinton Exhibit 11, Veeru Perianan, Director, Multi-Asset Research,
3 Charles Schwab Investment Advisory, Inc., predicts that the
4 annualized returns on large capitalized stocks over the next ten
5 years will be 6.6% as compared to the 10.8% historical return
6 experienced since 1970.

7 **VI. SUMMARY AND RECOMENDATIONS**

8 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS**
9 **CONCERNING THE COST OF CAPITAL.**

10 A. Based on the results of my analysis and study, I recommend that
11 the appropriate overall cost of capital in this case be set at 6.75%
12 as shown on Hinton Exhibit 12. This recommendation is derived
13 based on a capital structure consisting of 48.80% long-term debt,
14 0.67% short-term debt, and 50.53% common equity, with a
15 recommended cost of long-term debt of 4.08%, a recommended
16 cost of short-term debt of 0.20%, and a recommended cost of
17 common equity of 9.42%.

18 **VII: REVISIONS TO THE GAS EXTENSION FEASIBILTY MODEL**

19 **Q. PLEASE DISCUSS THE COMPANY'S MODEL USED TO**
20 **CALCULATE THE FEASIBILITY OF EXTENDING NATURAL GAS**
21 **SERVICE TO ITS RESIDENTIAL AND COMMERCIAL**
22 **CUSTOMERS.**

1 A, The Company calculates the economic feasibility of providing new
2 gas service by estimating the costs for the connection beyond the
3 allowed 100 feet of main line and 100 feet of service line, offset by
4 the cash flows generated by the expected gas margins associated
5 with the customer's expected gas usage. The feasibility study
6 follows capital budgeting practice involving the projection of the
7 after tax cash flows over the next 20 years from this customer
8 discounted to arrive at a net present value (NPV) and an internal
9 rate of return (IRR). If the project has a positive present value, then
10 the customer does not have to make a contribution in aid of
11 construction (CIAC); however, where the costs to connect are
12 greater than the NPV, there is a CIAC requirement.

13 **Q. PLEASE ADDRESS YOUR CONCERNS WITH THE COMPANY'S**
14 **MODEL.**

15 A. I have three concerns based on the lack of adherence to the
16 Commission's NPV Guidelines approved on August 4, 1999, in
17 Docket No. G-100, Sub 75. These Guidelines were applied to
18 projects to extend natural gas service to various unserved counties
19 such as McDowell County in Docket No. G-5, Sub 337, Alexander
20 County in Docket No. G-5, Sub 391, and Onslow County in Docket
21 G-21, Sub 330. Under the Guidelines, the appropriate investment
22 horizon is 40 years. Thus in this case, I recommend the use of 40
23 years or an appropriate length of time that matches the book lives

1 of the gas plant. Second, the Guidelines directed the use of the
2 approved net of tax discount rate employed for the NPV analysis.
3 Third, the Guidelines required that all future cash flows be adjusted
4 by a forecasted long-term inflation rate. The Company's current
5 feasibility model assumes that the margins remain static over the
6 20-year investment horizon. As such, I recommend that the gas
7 margins associated with the customer's gas usage be adjusted for
8 expected inflation. At this time, I recommend the use of a 2.0%
9 long-term inflation rate for all gas flows that generally include gas
10 margins and O&M expense.

11 **Q. WHAT IS THE BASIS FOR A 2% LONG-TERM INFLATION**
12 **RATE?**

13 A. While the rate is slightly below the long-term inflation rates that
14 have been employed in recent nuclear decommissioning filings and
15 recent electric utility integrated resource planning (IRP)
16 proceedings, I believe it is a reasonable rate for this application
17 where future operating and maintenance (O&M) expanses and
18 margins are inflated over the next 40 years. Furthermore, it is my
19 understanding that a **[BEGIN CONFIDENTIAL]** [REDACTED] **[END**
20 **CONFIDENTIAL]** inflation rate has been applied to O&M expenses
21 for the provision of gas service to Duke Energy Carolina, LLC's

1 combustion turbine in Lincoln County, North Carolina and other gas
2 expansion models reviewed by the Public Staff.²²

3 The Public Staff has discussed its proposed changes to the gas
4 extension model with the Company, and it supports these three
5 adjustments. In my opinion, these revisions will lead to a more
6 accurate assessment of the economic value of new customers.

7 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

8 **A. Yes.**

²² Docket Nos. G-9, Sub 750 and G-9, Sub 720.

APPENDIX A

QUALIFICATIONS AND EXPERIENCE

JOHN ROBERT HINTON

I received a Bachelor of Science degree in Economics from the University of North Carolina at Wilmington in 1980 and a Master of Economics degree from North Carolina State University in 1983. I joined the Public Staff in May of 1985. I filed testimony on the long-range electrical forecast in Docket No. E-100, Sub 50. In 1986, 1989, and 1992, I developed the long-range forecasts of peak demand for electricity in North Carolina. I filed testimony on electricity weather normalization in Docket Nos. E-7, Sub 620, E-2, Sub 833, and E-7, Sub 989. I filed testimony on customer growth and the level of funding for nuclear decommissioning costs in Docket No. E-2, Sub 1023, Docket No. E-2, Sub 1219, and similar proceedings on the level of funding for nuclear decommissioning costs in Docket Nos. E-7, Sub 1026, and E-7, Sub 1146. I have filed testimony on the Integrated Resource Plans (IRPs) filed in Docket No. E-100, Subs 114 and 125, and I have reviewed numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual IRPs or IRP updates.

I have been the lead analyst for the Public Staff in numerous avoided cost proceedings, filing testimony in Docket No. E-100, Subs 106, 136, 140,

148, and 158. I have filed a Statement of Position in the arbitration case involving EPCOR and Progress Energy Carolinas in Docket No. E-2, Sub 966.

I have filed testimony on the issuance of certificates of public convenience and necessity (CPCN) in Docket Nos. E-2, Sub 669, SP-132, Sub 0, E-7, Sub 790, E-7, Sub 791, and E-7, Sub 1134.

I have filed testimony on the issue of fair rate of return for electric utilities in Docket Nos. E-22, Sub 333; E-22, Sub 412; and E-22, Sub 532. I have filed testimony on credit metrics and the risk of a downgrade in Docket No. E-7, Sub 1146; the rate of return for telephone utilities in P-26, Sub 93; P-12, Sub 89; P-100, Sub 133b; and P-100, Sub 133d (1997 and 2002); the rate of return for natural gas utilities in G-21, Sub 293; P-31, Sub 125; G-5, Sub 327; G-5, Sub 386; G-9, Sub 351; and G-21, Sub 442; and the rate of return for water utilities in W-778, Sub 31; W-218, Sub 319; W-354, Sub 360, and in several smaller water utility rate cases.

I have filed testimony on the hedging of natural gas prices in Docket No. E-2, Subs 1001 and 1018. I have filed testimony on the expansion of natural gas in Docket No. G-5, Subs 337 and 372. I performed the financial analysis in the two audit reports on Mid-South Water Systems, Inc., Docket No. W-100, Sub 21. I testified in the application to transfer of the CPCN from North Topsail Water and Sewer, Inc. to Utilities, Inc., in Docket No. W-

1000, Sub 5. I have filed testimony on weather normalization of water sales in Docket No. W-274, Sub 160.

With regard to the 1996 Safe Drinking Water Act, I was a member of the Small Systems Working Group that reported to the National Drinking Water Advisory Council of the U.S. Environmental Protection Agency. I have published an article in the National Regulatory Research Institute's Quarterly Bulletin entitled Evaluating Water Utility Financial Capacity.

RISK MEASURES

SAFETY RANK¹

Value Line's Safety Rank is a measure of the total risk of a stock. It includes factors unique to the company's business such as its financial condition, management competence, etc. The Safety Rank is derived by averaging two variables: the stock's Price Stability Index, and the Financial Strength Rating of the company. The Safety Rank ranges from 1 (Highest) to 5 (Lowest).

BETA¹ (β)

The Value Line Beta is derived from a regression analysis between weekly percent changes in the price of a stock and weekly percent price changes in the New York Stock Exchange Composite Index over a period of five years.

There has been a tendency over the years for high Beta stocks to become lower and for low Beta stocks to become higher. This tendency can be measured by studying Betas of stocks in five consecutive intervals. The Betas published in the Value Line Investment Survey are adjusted for this tendency and hence are likely to be better predictors of future Betas than those based exclusively on the experience of the past five years.

The New York Stock Exchange Composite Index is used as the basis for calculating the Beta because this index is a good proxy for the complete equity portfolio. Since Beta's significance derives primarily from its usefulness in portfolios rather than individual stocks, it is best constructed by relating to an overall market portfolio. The Value Line Index, because it weights all stocks equally, would not serve as well.

The security's return is regressed against the return on the New York Stock Exchange Composite Index over the past five years, so that 259 observations of weekly price changes are used. Value Line adjusts its estimate of Beta (β_i) for regression described by Blume (1971). The estimated Beta is adjusted as follows:

$$\text{Adjusted } \beta_i = 0.35 + 0.67\beta$$

FINANCIAL STRENGTH RATING¹

Value Line's Financial Strength Ratings are primarily a measure of the relative financial strength of a company. The rating considers key variables such as coverage of debt, variability of return, stock price stability, and company size. The Financial Strength Ratings range from the highest at A++ to the lowest at C.

PRICE STABILITY INDEX¹

Value Line's Price Stability Index is based upon a ranking of the standard deviation of weekly percent changes in the price of a stock over the last five years. The top 5% carry a Price Stability Index of 100; the next 5%, 95; and so on down to an Index of 5.

EARNINGS PREDICTABILITY INDEX¹

Value Line's Earnings Predictability Index is a measure of the reliability of an earnings forecast. The most reliable forecasts tend to be those with the highest rating (100); the least reliable (5).

S&P BETA² (β)

The S&P Beta is derived from a regression analysis between 60 months of price changes in a company's stock price (plus corresponding dividend yield) and the monthly price changes in the S&P 500 Index (plus corresponding dividend yield). Prices and dividends are adjusted for all subsequent stock splits and stock dividends.

S&P BOND RATING²

The S&P Bond Ratings is an appraisal of the credit quality based on relevant risk factors. S&P reviews both the company's financial and business profiles. Shown below are the ratings:

- AAA An extremely strong capacity to pay interest and repay principal.
- AA+ A very strong capacity to pay interest and repay principal.
- AA There is only a small degree of difference between "AAA" and "AA"
- AA- Debt issues.
- A+ A strong capacity to pay interest and repay principal.

These A ratings indicate the obligor is more susceptible to changes in economic conditions than AAA" or "AA" debt issues.

BBB+ An adequate capacity to pay interest and repay principal.
BBB Economic conditions or changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal.
BB+ "BB" indicates less near-term vulnerability to default than other BB speculative issues.

However, these bonds face major ongoing BB uncertainties or exposure to adverse conditions that could lead to inadequate capacity to meet timely interest and principal payments.

S&P STOCK RANKING²

The S&P Stock Rankings is an appraisal of the growth and stability of the company's earnings and dividends over the past 10 years. The final score for each stock is measured against a scoring matrix determined by an analysis of the scores of a large and representative sample of stocks. Shown below are the rankings:

A+	Highest
A	High
A-	Above average
B+	Average
B	Below Average
B-	Lower
C	Lowest
D	In Reorganization
NR	Not rated

Moody's Bond Rating³

Moody's Bond Ratings is an appraisal of the credit quality based on relevant risk factors. Shown below are the ratings:

Aaa Obligations judged to be the highest quality and are subject to the very lowest level of credit risk

Aa Obligations judged to be the high quality and are subject to low level credit risk

A Obligations judged to be the upper medium grade and are subject to low credit risk

Baa Obligations judged to be the medium grade and are subject to moderate credit risk and may possess certain speculative characteristics

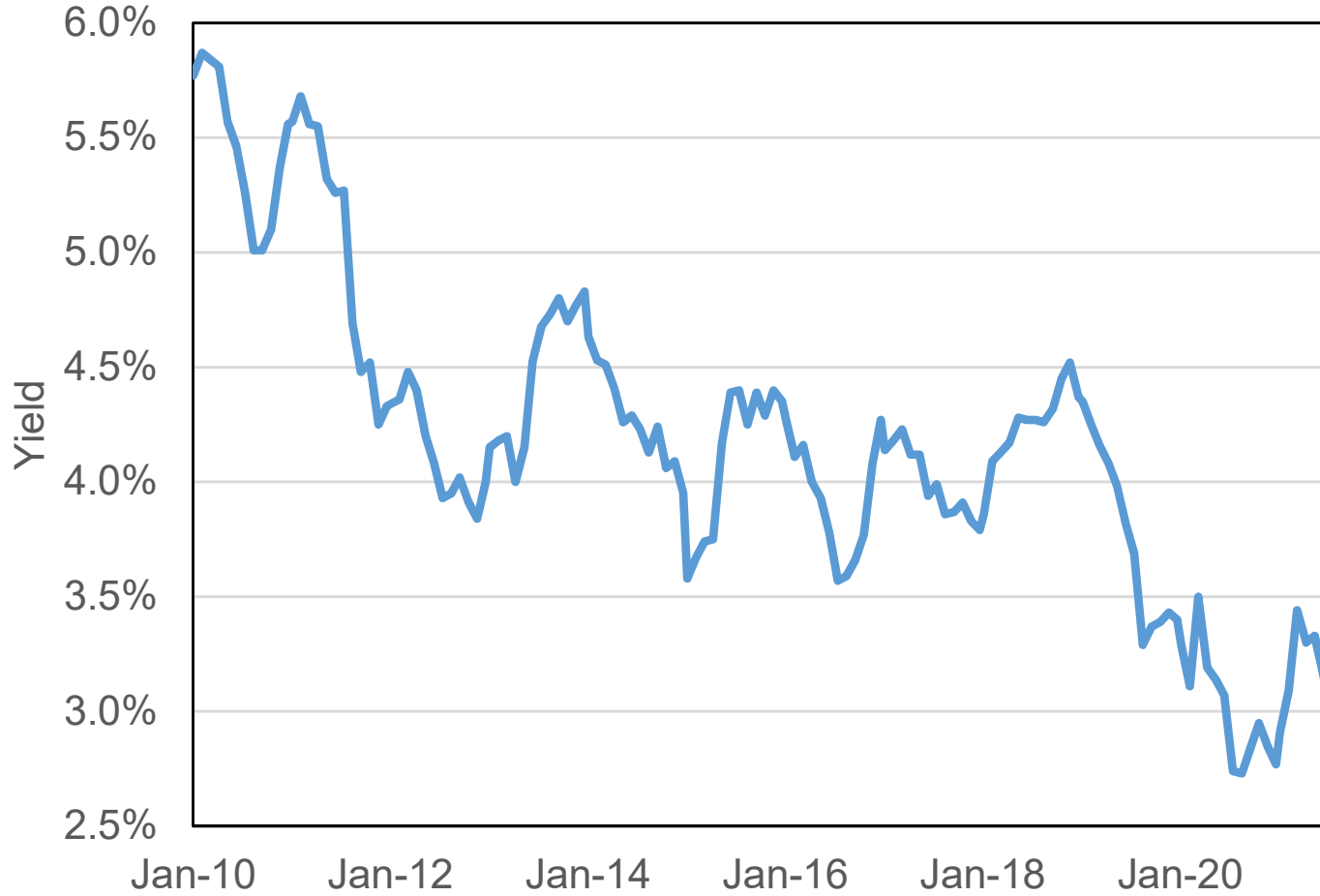
Ba Obligations judged to be speculative and subject to substantial credit risk

B Obligations are considered speculative and subject to high credit risk.

Sources:

1. Value Line Investment Analyzer, Version 3.3, New York, NY.
2. S&P Net Advantage and S&P Global Market Intelligence, July, 2019
3. Moody's Investor Service, Rating Symbols and Definitions, February, 2019

Moody's A-Rated Utility Bond Yields



Public Staff
Hinton Exhibit 1

THE WALL STREET JOURNAL.

Economists Got the Decade All Wrong. They're Trying to Figure Out Why.

The U.S. has enjoyed its longest economic expansion on record without triggering inflation as interest rates remain historically low

by Greg Ip

Dec. 14, 2019 1:00 pm ET



In the fall of 2009, the global financial crisis had only just ended, and interest rates were a mere 0.1%. Peering ahead, economists assumed the recovery would resemble previous recoveries, though a tad slower, and thus rates would start rising the next year and plateau at 4.2% by 2015.

But by the fall of 2010, rates hadn't budged. Like Charlie Brown taking another run at the football, economists gamely made the same forecast that year, and the year after that and the year after that. Rates remained stuck near zero until 2015, a stretch of free money unseen since the 1940s.

When rates started to rise, they didn't come close to levels once considered normal, ending the decade between 1.5% and 1.75%. Private-sector economists now expect them to average 2.4% over the long term, according to Blue Chip Economic Indicators. Judging by the bond market, they might have guessed high again: Ten-year Treasury note yields are just 1.8%—roughly zero, adjusted for inflation.

How could economists have gotten something so basic so spectacularly wrong? What was it about this past decade that made all their predictions go awry?



Fed Chairman Jerome Powell and former chairmen Janet Yellen and Ben Bernanke. The financial crisis was followed by a stretch of free money

Economists have been casting around for the answer, a theory to explain their inability to peer accurately into the months ahead, let alone the years. Such a theory must do more than say “The Federal Reserve did it.” It must explain why growth was the most subdued of any expansion since the 1940s and inflation consistently ran below the Fed’s 2% target, the reasons the Fed kept rates so low.

And, no less difficult, it would have to explain why, in spite of that subdued growth, the U.S. has enjoyed its longest economic expansion on record, one marked by a record-breaking bull market in stocks and unemployment falling to a 50-year low.

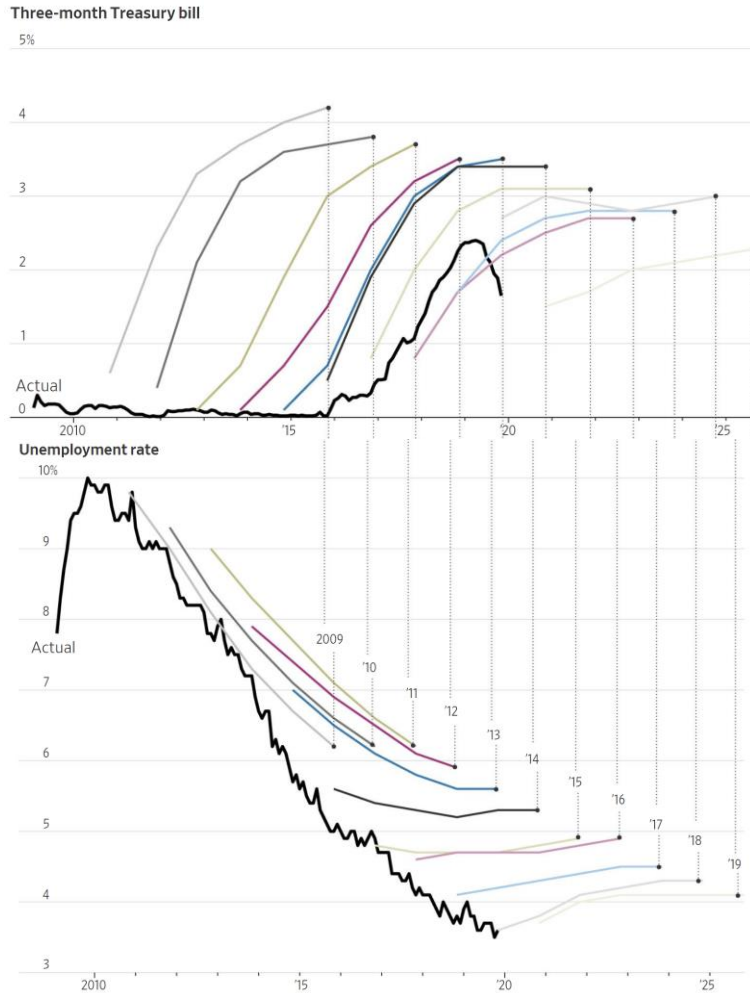
One explanation is the “debt hangover” theory popularized by Carmen Reinhart and Kenneth Rogoff, whose history of financial crises, “This Time Is Different: Eight Centuries of Financial Folly,” was a sleeper hit in 2009. They found that in the wake of financial crises, households, banks, businesses and sometimes governments are fixated on paying down debts and wary that another crisis is around the corner, so they avoid borrowing and investing. This holds down growth, inflation and interest rates.

The U.S. initially tracked this model. It had barely exited its own crisis when another erupted in the eurozone, pushing Greece into default and others to the brink of it.

But as those crises faded from view, low growth, inflation and rates persisted.

A Confounding Decade

Since 2009 economists’ projections of interest rates and unemployment (shown with year made) have consistently proved too high.



Sources: Blue Chip Economic Indicators (forecasts); Federal Reserve Bank of St. Louis (actual T-bill, unemployment rates)

So in 2013 Larry Summers, a former top adviser to Presidents Bill Clinton and Barack Obama and now an economist at Harvard University, advanced an alternative explanation: [“secular stagnation.”](#) He borrowed the phrase from an earlier Harvard economist, Alvin Hansen who used it in 1938 to describe the Great Depression’s persistently weak growth and high unemployment. Mr. Hansen tied it to weak investment due to slow population growth: Businesses had less need to invest when there were fewer new workers and customers and when aging households bought fewer big-ticket products like houses.

Slow population growth is once again weighing on growth and interest rates, Mr. Summers noted, and he added several other factors: the fastest-growing businesses, such as social-media platforms, invest little of their rich profits. Higher inequality meant more income flows to the high-saving, low-spending rich.

Though initially skeptical of Mr. Summers’s thesis, many economists have since warmed to it, at least for other parts of the world, if not the U.S. In some countries like Germany a persistent

excess of savings manifests itself as a trade surplus which flows into other countries' bonds, holding down interest rates around the world.

Secular stagnation has several profound implications. First, with interest rates closer to zero, central banks are less able to combat future recessions. Second, a structural shortage of private borrowing means governments can run big deficits without pushing up interest rates. Indeed, given central banks' lack of ammunition, governments should run deficits, or the economy will stagnate. Reducing entitlements such as future Social Security benefits in the name of fiscal prudence may worsen the problem by encouraging households to save more.

Secular stagnation also increases the risk of protectionism. Any country with too little domestic demand to achieve full employment and 2% inflation will be tempted to foist the problem on its neighbors by cheapening its currency or erecting tariffs so as to export more and import less.

Yet in key respects the past decade doesn't conform to the gloomy prognosis of secular stagnation: The stock market has romped to one record after another, and job growth has remained consistently strong.

As with interest rates, economists have been surprised by unemployment, which peaked at almost 10% in 2010. Year after year, they expected it to bottom out around 5%. It's now down to 3.5%, a 50-year low, and likely headed lower.

The expansion is now the longest since records begin in the mid-1800s. It bears little resemblance to the 1930s, which Mr. Hansen described as "sick recoveries which die in their infancy and...leave a hard and seemingly immovable core of unemployment."



Job seekers and recruiters at a fair in Los Angeles. Economists have been surprised by the continued decline of unemployment.

This points to a third possible theory. The so-called natural rate of unemployment, the lowest the U.S. can sustain without running out of workers or pushing up inflation (called u^* or "u-star" in economists' equations) is much lower than previously thought. So the recovery has had more ground to cover than many realized, and as a result the economy has spent much of the past decade operating well below capacity.

Jan Hatzius, chief economist at Goldman Sachs, says there isn't a lot of mystery about the behavior of inflation and interest rates: "We fell into a deep hole so we had a lot of spare capacity, and it took a long time to climb out."

The U.S. may have finally climbed out, but until Europe has as well, interest rates may remain low, he says. "How secular is it? How cyclical? Until you've seen economies really normalize from a cyclical perspective it's going to be hard to fully distinguish between those two things."

In other words, it might take the next decade to answer what really happened in the last.

Mr. Ip is The Wall Street Journal's chief economics commentator, in Washington. He can be reached at greg.ip@wsj.com.



CREDIT OPINION

16 July 2021

Update

✓ Rate this Research

RATINGS

Piedmont Natural Gas Company, Inc.

Domicile	North Carolina, United States
Long Term Rating	A3
Type	Senior Unsecured - Dom Curr
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Piedmont Natural Gas Company, Inc.

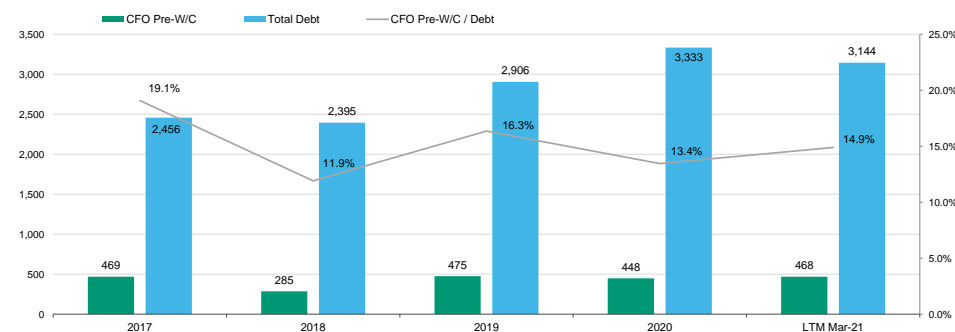
Update to credit analysis

Summary

Piedmont Natural Gas Company, Inc.'s (Piedmont) credit profile reflects its low business risk as a regulated natural gas local distribution company (LDC) operating in supportive regulatory jurisdictions in North Carolina, South Carolina and Tennessee. Our opinion recognizes that credit metrics have been impacted by the negative cash flow impact of federal tax reform and a large capital program and therefore will not return to pre-tax reform highs. We expect the company's average ratio of cash flow from operations excluding changes in working capital (CFO pre-WC) to debt will be maintained at around 15%-16% over the next two years.

Exhibit 1

Historical CFO Pre-WC, Total Debt and CFO Pre-WC to Debt (\$ MM) [1]



[1] CFO pre-WC is defined as cash flow from operations excluding changes in working capital
Source: Moody's Financial Metrics

Credit strengths

- » Credit supportive regulatory environments in North Carolina, South Carolina and Tennessee
- » Utility growth driven by customer additions and system integrity investment
- » Position as part of the Duke corporate family

Credit challenges

- » Elevated capital expenditure program
- » Increased leverage
- » Weak credit metrics for an A3 rated LDC

Rating outlook

Piedmont's stable outlook reflects our expectation that the company will continue to receive credit supportive regulatory treatment across each of its jurisdictions. The outlook also incorporates our expectation that credit metrics, which are weak and have been adversely affected by the negative cash flow impact of federal tax reform and increased leverage due to a large capital program, will remain below pre-tax reform highs. Going forward, on average, we expect Piedmont's ratio of CFO pre-WC to debt to be between 15% and 16%.

Factors that could lead to an upgrade

- » An increase in cash flow or reduction in leverage leading to a ratio of CFO pre-WC to debt that remains above 18% could put upward pressure on credit quality

Factors that could lead to a downgrade

- » Piedmont's credit profile could weaken if there is a significant deterioration in the company's regulatory environments
- » Or, if we expect the CFO pre-WC to debt ratio to be below 14% for an extended period, there could also be downward pressure

Key indicators

Piedmont Natural Gas Company, Inc. [1]

	Dec-17	Dec-18	Dec-19	Dec-20	LTM Mar-21
CFO Pre-W/C + Interest / Interest	6.1x	3.9x	5.2x	4.5x	4.6x
CFO Pre-W/C / Debt	19.1%	11.9%	16.3%	13.4%	14.9%
CFO Pre-W/C – Dividends / Debt	19.1%	11.9%	16.3%	13.4%	14.9%
Debt / Capitalization	52.7%	47.8%	48.3%	48.6%	43.6%

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Source: Moody's Financial Metrics

Profile

Headquartered in Charlotte, North Carolina, Piedmont is a local natural gas distribution company subsidiary of Duke Energy Corporation (Duke Energy, Baa2 stable) with 1.1 million customers in the southeastern U.S. Piedmont has operations in three states, North Carolina (73% of rate base), Tennessee (19%), and South Carolina (8% of rate base).

Piedmont holds indirect equity stakes in several energy related joint ventures including: Hardy Storage Company (50% ownership) in West Virginia, the Pine Needle LNG Company LLC (45% ownership) and the intrastate Cardinal Pipeline (21.5% ownership) servicing North Carolina. Piedmont also subscribes to the services of these entities.

Detailed credit considerations

Credit supportive regulatory environments

Piedmont's operations are subject to the regulatory overview of the North Carolina Utilities Commission (NCUC), the Public Service Commission of South Carolina (PSCSC), and the Tennessee Public Utility Commission (TPUC). We consider the regulatory environments to be credit supportive. The three states all provide cost recovery mechanisms and frameworks that lead to shorter regulatory lag and reasonable returns on utility investments.

Piedmont recovers its natural gas costs through a purchased gas adjustment mechanism in all three of its operating jurisdictions. In North Carolina (73% of rate base at the end of 2020), Piedmont has a full margin decoupling mechanism for residential and commercial customers, allowing the LDC to true up any over/under collection of margin regardless of customer demand through semi-

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moody's.com for the most updated credit rating action information and rating history.

annual rate adjustments. This enhances cash flow predictability, a credit positive. The company also has a specific rider to recover bad debt expense.

In March 2021, Piedmont filed a general rate case in North Carolina requesting a 10.4%, or approximately \$109 million, increase in retail revenues. The rate case filing request is premised on an ROE of 10.25% and a 52% equity component of the capital structure. The filing is based on a North Carolina rate base of \$4.8 billion as of December 31, 2020, as adjusted for known and measurable changes through June 30, 2021. The request includes approximately \$1.7 billion of plant additions related to system growth, pipeline integrity management, infrastructure investments, and safety and security upgrades. Approximately 70% of the plant additions are categories of plant investment not covered under the Integrity Management Rider (IMR) mechanism, such as Piedmont's new liquefied natural gas storage facility located in Robeson County, NC and enhancements to an existing storage facility in Huntersville, NC.

Piedmont's last North Carolina rate case was decided in November 2019 when the company was authorized a \$109 million increase (before consideration of decrease riders associated with federal and state tax reform) based on a 9.7% ROE and a 52% equity layer.

In Tennessee (19% of rate base at the end of 2020), the TPUC allows Piedmont to benefit from a Weather Normalization Adjustments (WNA) clause but not from a decoupling mechanism. However, Piedmont is allowed to use a forward test year with its rate filings. Piedmont also benefits from an Integrity Management Rider (IMR) that allows the LDC to recover investments related to federal and state mandated safety and integrity programs. Piedmont has successfully implemented rate adjustments under the IMR each year since the program began. The company also has a specific rider to recover bad debt expense.

In July 2020, Piedmont filed its first general rate case in Tennessee in nine years, requesting an approximate 15%, \$30 million (subsequently reduced to \$26 million), increase in annual revenue. The request was driven by significant infrastructure upgrades, approximately half of which are not covered by the company's 2013 approved pipeline integrity management rider mechanism. As authorized by Tennessee, interim rates were implemented on January 2, 2021. In February 2021, the TPUC accepted a settlement granting the company a \$16 million increase based on a 9.8% ROE. Rates were made effective January 2, 2021, with Piedmont to refund the difference between the interim and settled rates.

In South Carolina (8% of rate base at the end of 2020), Piedmont benefits from rate stabilization tariffs. Under the South Carolina Rate Stabilization Act, tariffs are subject to annual true-ups to support the company's allowed ROE (10.2%). In addition, a WNA mechanism offsets volume fluctuations in the winter season. The company also has a specific rider to recover bad debt expense.

In North Carolina and South Carolina, rates are set based on historical test years, which exposes the LDC to a lag in its investment cost recovery. However, similar to Tennessee, in North Carolina the NCUC has authorized the use of an IMR which allows the company to recover integrity related capital expenditures outside of general rate cases, a credit positive. Rate adjustments are now made semiannually each December and June.

Utility growth driven by customer additions and system integrity investments

Between 2015 and 2019, Piedmont's total capital expenditures increased steadily as the company invested in system integrity and to support customer growth. Annual expenditures grew from \$455 million in 2015 to over \$1 billion in 2019, slightly declining to \$901 million in 2020. Spending is expected to decline somewhat to an average of about \$800 million per year for the 2021-2025 period.

For the 2021-2025 period, Piedmont expects to deploy a total of about \$4 billion of capital of which approximately 80% has been identified as growth capital. Of this, close to 60% is expected to be recovered via integrity management riders, which assures recovery will begin with minimal lag, a credit positive. Although recovery is expected to begin quickly, given the long-lived nature of these assets (which lowers the amount of depreciation included in the revenue requirement) and the loss of bonus depreciation that occurred following the enactment of federal tax reform in December of 2017, we expect credit metrics will remain below the highs demonstrated prior to 2018.

Weak credit metrics for an A3 rated LDC

Prior to 2018, Piedmont's cash flow and credit metrics were relatively strong, with the ratio of CFO pre-W/C to debt in the range of 20%. More recently, given the impact of federal tax reform, the utility's robust capital expenditure program and the associated leverage to fund these investments, credit metrics have declined significantly and are now weak for an A3 rated LDC. Going forward, in light of the company's relatively constructive regulatory environments, numerous rate adjustment mechanisms and planned rate case activity,

we believe the company will demonstrate an average ratio of CFO pre-WC to debt around 15% to 16%. We note that Piedmont has not paid a dividend to parent Duke Energy since 2016 and has received capital contributions from Duke totaling \$775 million since 2018, helping to limit the extent of the deterioration in credit metrics and support the utility through a period of elevated capital expenditures.

ESG considerations

Environmental considerations incorporated into our credit analysis for Piedmont are primarily related to air pollution and regulations around carbon, methane and other greenhouse gas emissions. These gases are emitted during the natural gas life cycle, including through the production of the energy that the company delivers through its own gas infrastructure.

Social risks are primarily related to health and safety, demographic and societal trends, as well as customer relations as the company works to provide reliable and affordable service to customers and safe working conditions to employees.

From a governance perspective, financial and risk management policies including a strong financial profile are important characteristics for managing environmental and social risks.

Liquidity analysis

Given its large capital expenditure program, Piedmont will continue to rely on external financing sources to maintain an adequate liquidity profile. For the last twelve months ended March 31, 2021, Piedmont generated \$516 million of cash from operations (CFO), invested \$870 million in capital expenditures and made no distributions to the parent which resulted in negative free cash flow (FCF) of \$354 million. In 2020, Piedmont generated \$481 million of CFO, invested approximately \$901 million in capital expenditures and made no distributions to parent Duke Energy which resulted in negative FCF of \$420 million. The shortfalls were partially funded with equity infusions from Duke Energy. We expect Piedmont to be cash flow negative for the next few years as capital expenditures remain elevated as the company spends for customer growth and system integrity. We expect shortfalls will primarily be funded with a combination of long-term and short-term debt financing.

Piedmont's additional liquidity sources include access to funding from the parent company's commercial paper program through the Duke Energy system money pool, and direct borrowings from the money pool. As of March 31, 2021, the utility had \$700 million of borrowing capacity under Duke Energy's \$8 billion multi-year (March 2026 termination) master credit facility. Duke Energy has unilateral ability to increase Piedmont's borrowing capacity, up to \$850 million, which could provide significant additional liquidity as needed. As of March 31, 2021, the utility had no commercial paper outstanding, leaving \$700 million available under the parent credit facility. The facility does not contain a material adverse change clause for new borrowings and has a single financial covenant requiring that Duke Energy and its utility subsidiaries each maintain a consolidated debt to capitalization ratio of no more than 65%, except for Piedmont. The debt to capital covenant for Piedmont is a maximum of 70%. As of March 31, 2021, we estimate Piedmont's ratio to be about 49%.

Piedmont's nearest long-term debt maturity is \$45 million of unsecured notes due October 2023.

Rating methodology and scorecard factors

Methodology Scorecard Factors
Piedmont Natural Gas Company, Inc.

Regulated Electric and Gas Utilities Industry Scorecard [1][2]	Current LTM 3/31/2021		Moody's 12-18 Month Forward View As of Date Published [3]	
	Measure	Score	Measure	Score
Factor 1 : Regulatory Framework (25%)				
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	Aa	Aa	Aa	Aa
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	A	A	A	A
b) Sufficiency of Rates and Returns	A	A	A	A
Factor 3 : Diversification (10%)				
a) Market Position	A	A	A	A
b) Generation and Fuel Diversity	N/A	N/A	N/A	N/A
Factor 4 : Financial Strength (40%)				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	4.7x	A	4.9x - 5.4x	A
b) CFO pre-WC / Debt (3 Year Avg)	15.1%	Baa	14% - 16%	Baa
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	15.1%	A	14% - 16%	A
d) Debt / Capitalization (3 Year Avg)	45.4%	A	43% - 47%	A
Rating:				
Scorecard-Indicated Outcome Before Notching Adjustment		A2		A2
HoldCo Structural Subordination Notching		0		0
a) Scorecard-Indicated Outcome		A2		A2
b) Actual Rating Assigned		A3		A3

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

[2] As of 3/31/2021 (LTM)

[3] This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures.

Source: Moody's Financial Metrics

Appendix

Exhibit 4

Peer Comparison Table [1]

(In US millions)	Piedmont Natural Gas Company, Inc. A3 (Stable)			Public Service Co. of North Carolina, Inc. Baa1 (Stable)			DTE Gas Company A3 (Stable)			Spire Alabama Inc. A2 (Stable)		
	FYE	FYE	LTM	FYE	FYE	LTM	FYE	FYE	LTM	FYE	FYE	LTM
	Dec-19	Dec-20	Mar-21	Dec-19	Dec-20	Mar-21	Dec-19	Dec-20	Mar-21	Dec-19	Sep-20	Mar-21
Revenue	1,381	1,297	1,391	545	525	552	1,462	1,396	1,468	466	455	480
EBITDA	498	587	623	203	227	231	469	483	530	169	177	186
Total Debt	2,906	3,333	3,144	911	973	903	1,997	2,168	2,030	624	678	703
CFO Pre-W/C / Debt	16.3%	13.4%	14.9%	12.6%	14.3%	19.7%	18.4%	18.9%	22.9%	28.3%	25.7%	26.5%
CFO Pre-W/C – Dividends / Debt	16.3%	13.4%	14.9%	11.2%	14.3%	17.5%	12.3%	12.6%	16.0%	25.2%	22.1%	23.2%
Debt / Capitalization	48.3%	48.6%	43.6%	43.1%	41.0%	38.5%	44.2%	43.9%	40.8%	43.0%	44.4%	44.0%
Debt / EBITDA	5.8x	5.7x	5.0x	4.5x	4.3x	3.9x	4.3x	4.5x	3.8x	3.7x	3.8x	3.8x
EBITDA / Interest Expense	4.4x	4.6x	4.8x	4.6x	5.4x	5.7x	5.8x	5.9x	6.4x	7.1x	7.3x	7.9x

[1] All figures & ratios calculated using Moody's estimates & standard adjustments. FYE = Financial Year-End. LTM = Last Twelve Months. RUR* = Ratings under Review, where UPG = for upgrade and DNG = for downgrade

Source: Moody's Financial Metrics

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Exhibit 5

Cash Flow and Credit Metrics [1]

CF Metrics	Dec-17	Dec-18	Dec-19	Dec-20	LTM Mar-21
As Adjusted					
FFO	464	283	484	452	454
+/- Other	5	2	-9	-4	14
CFO Pre-WC	469	285	475	448	468
+/- ΔWC	-125	185	-88	31	46
CFO	344	470	387	479	514
- Div	0	0	0	0	0
- Capex	579	713	1,031	899	868
FCF	-235	-243	-644	-420	-354
(CFO Pre-W/C) / Debt	19.1%	11.9%	16.3%	13.4%	14.9%
(CFO Pre-W/C - Dividends) / Debt	19.1%	11.9%	16.3%	13.4%	14.9%
FFO / Debt	18.9%	11.8%	16.7%	13.6%	14.4%
RCF / Debt	18.9%	11.8%	16.7%	13.6%	14.4%
Revenue	1,328	1,375	1,381	1,297	1,391
Interest Expense	92	100	114	127	129
Net Income	144	89	170	258	284
Total Assets	6,244	6,837	7,730	8,607	8,910
Total Liabilities	4,603	4,771	5,323	5,898	5,673
Total Equity	1,641	2,066	2,407	2,709	3,237

[1] All figures and ratios are calculated using Moody's estimates and standard adjustments. Periods are Financial Year-End unless indicated. LTM = Last Twelve Months
Source: Moody's Financial Metrics

Exhibit 6

Moody's - Adjusted Debt Breakdown
Piedmont Natural Gas Company, Inc.

(USD Millions)	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Mar-21
As Reported Debt	2,401.0	2,336.0	2,860.0	3,310.0	3,127.0
Pensions	4.0	3.0	4.0	0.0	0.0
Unusual	0.0	0.0	0.0	0.0	0.0
Non-Standard Adjustments	13.0	12.0	15.0	0.0	0.0
Moody's Adjusted Debt	2,456.1	2,395.0	2,906.0	3,333.0	3,144.0

All figures are calculated using Moody's estimates and standard adjustments
Source: Moody's Financial Metrics™

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Ratings

Exhibit 7

Category	Moody's Rating
PIEDMONT NATURAL GAS COMPANY, INC.	
Outlook	Stable
Senior Unsecured	A3
PARENT: DUKE ENERGY CORPORATION	
Outlook	Stable
Issuer Rating	Baa2
Sr Unsec Bank Credit Facility	Baa2
Senior Unsecured	Baa2
Jr Subordinate	Baa3
Pref. Stock	Ba1
Commercial Paper	P-2

Source: Moody's Investors Service

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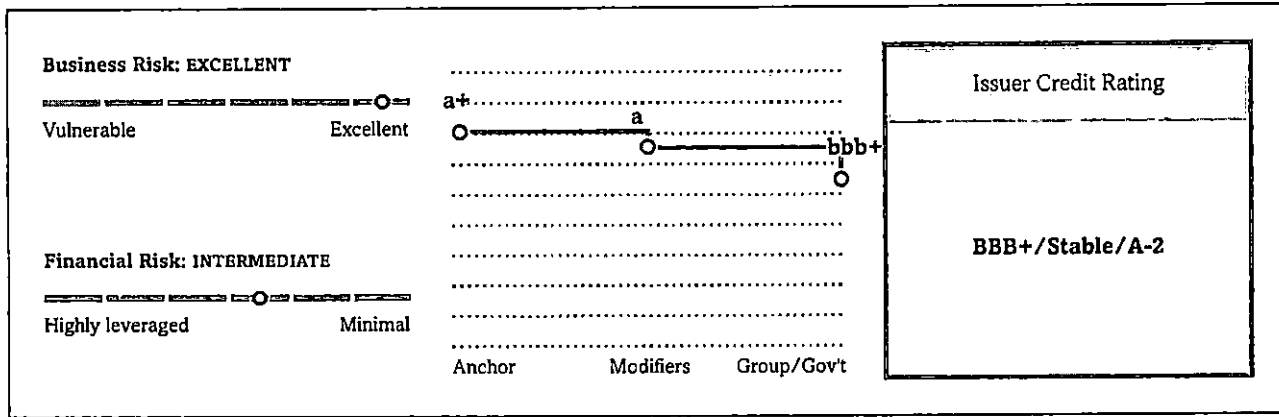
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Related Criteria

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Piedmont Natural Gas Co. Inc.



Credit Highlights

Overview	
Key strengths	Key risks
Lower-risk regulated gas utility that effectively manages its regulatory risk.	Most of service territory is exposed to extreme weather events, including hurricanes.
Customer base of more than 1 million provides stability to the company's cash flows.	Forecast negative discretionary cash flow indicates external funding needs.
Diverse source of cash flows from operations spread across North Carolina, South Carolina, and Tennessee.	
Operating assets are generally of higher quality compared to gas utility peers.	

Our ratings on Piedmont Natural Gas Co. Inc. are underpinned by our ratings on its immediate parent, Duke Energy Corp. We consider Piedmont to be a strategically important subsidiary of Duke. Although Piedmont is a successful utility operator, has Duke's long-term commitment, and is important to Duke's long-term strategy, we no longer view Piedmont as a core subsidiary of Duke. This view reflects the recently announced sale of an almost 20% equity stake in another Duke subsidiary, Duke Energy Indiana to GIC that we believe because of Duke's high capital spending program, could potentially be replicated at any of Duke's relatively smaller subsidiaries. Piedmont accounts for approximately 5% of Duke's regulated EBITDA. This assessment has no effect on Piedmont's stand-alone credit profile, issuer credit rating, nor issue ratings.

We expect Piedmont to manage risks related to COVID-19. As of Oct. 1, 2020, normal billing procedures resumed in all of Piedmont's service territories, and service disconnections for nonpayment resumed on Nov. 4, 2020. Overall, we expect the company to use a combination of factors to mitigate any potential cash flow shortfalls stemming from the pandemic. This includes effective expense management and working constructively with its regulators.

Piedmont's rate case with the Tennessee Public Utility Commission (TPUC) is pending. Piedmont filed for a general rate case increase with the TPUC on July 2, 2020. Piedmont requested a rate increase of about \$30 million for retail customers based on 10.3% return on equity (ROE) and 50.5% equity component of capital structure. As of February 2021, the company has reached a settlement on this rate case with several parties. Although the terms of the settlement indicate a lower overall rate increase of about \$16 million premised on a 9.8% ROE, other factors, such as the 50.5% authorized equity layer are favorable for Piedmont's stand-alone credit quality. It is likely a decision on this rate case could be reached by mid-2021.

Our stand-alone credit profile for Piedmont includes a negative comparable ratings analysis modifier. This incorporates our forecast for Piedmont's financial measures, which we expect will consistently reflect the lower end of its financial risk profile category, compared to peers. Specifically, we expect Piedmont's funds from operations (FFO) to debt ratio to average about 14% over our forecast period.

Outlook

The stable outlook on Piedmont reflects our stable outlook on parent Duke Energy and our expectations that Piedmont's stand-alone financial measures will be consistent with the lower end of the range for its financial risk profile category, reflecting FFO to debt of about 14% (assessed under our low-volatility financial benchmark table).

Downside scenario

We could lower our ratings on Piedmont over the next 12-24 months if we downgrade parent Duke. We could also lower Piedmont's ratings if its stand-alone business risks increase or if its stand-alone financial measures weaken such that FFO to debt consistently weakens to below 9%.

Upside scenario

We could raise our ratings on Piedmont over the next 12-24 months if parent Duke Energy is upgraded and Piedmont's stand-alone financial measures are maintained such that FFO to debt is consistently above 9%, without incurring higher business risks.

Our Base-Case Scenario

Assumptions

- Continued use of existing regulatory cost recovery mechanisms, and periodic rate case filings.
- Capital spending of about \$875 million in 2020, \$725 million in 2021, and averaging slightly above \$815 million annually beginning in 2022.
- No cash dividends to parent until 2023.
- Negative discretionary cash flow throughout our forecast period.

Key Metrics

	2019a	2020e	2021e
FFO to debt (%)	14.4	14-15	14-15
Debt to EBITDA (x)	5.8	5.3	5.0
Cash FFO to interest	4.7	4.6	4.8

a--Actual. e--Estimate. FFO--Funds from operations.

Company Description

Piedmont Natural Gas Co. Inc. is a regulated gas utility company. It provides gas service to about 1 million residential,

commercial, and industrial customers, including power generation and municipal customers, in North Carolina, South Carolina, and Tennessee. Piedmont is a subsidiary of Duke Energy, and it contributes about 5% of Duke Energy's regulated EBITDA.

Peer comparison

Table 1

Piedmont Natural Gas Co. Inc. Peer Comparison					
Industry Sector: Gas					
	Piedmont Natural Gas Co. Inc.	Atmos Energy Corp.	Southwest Gas Corp.	ONE Gas Inc.	Southern Co. Gas
Ratings as of Jan. 13, 2021	BBB+/Stable/A-2	A/Stable/A-1	A-/Stable/--	A/Stable/A-1	A-/Negative/A-2
	--Fiscal year ended Dec. 31, 2019--	--Fiscal year ended Sept. 30, 2020--	--Fiscal year ended Dec. 31, 2019--	--Fiscal year ended Dec. 31, 2019--	--Fiscal year ended Dec. 31, 2019--
(Mil. \$)					
Revenue	1,381.0	2,821.1	1,368.9	1,652.7	3,792.0
EBITDA	489.0	1,304.4	506.0	493.5	1,561.0
Funds from operations (FFO)	409.0	1,089.4	412.0	396.3	1,341.6
Interest expense	115.0	99.8	99.6	68.5	241.4
Cash interest paid	111.0	218.0	93.3	67.0	260.4
Cash flow from operations	387.0	1,055.8	364.7	313.0	1,075.6
Capital expenditure	1,027.0	1,927.2	774.2	412.7	1,402.0
Free operating cash flow (FOCF)	(640.0)	(871.4)	(409.5)	(99.7)	(326.4)
Discretionary cash flow (DCF)	(640.0)	(1,153.8)	(505.4)	(212.7)	(797.4)
Cash and short-term investments	0.0	20.8	40.5	17.9	46.0
Debt	2,833.4	5,053.9	2,607.2	1,807.1	5,752.1
Equity	2,443.0	6,791.2	2,005.2	2,129.4	9,506.0
Adjusted ratios					
EBITDA margin (%)	35.4	46.2	37.0	29.9	41.2
Return on capital (%)	6.6	7.7	7.1	7.9	7.2
EBITDA interest coverage (x)	4.3	13.1	5.1	7.2	6.5
FFO cash interest coverage (x)	4.7	6.0	5.4	6.9	6.2
Debt/EBITDA (x)	5.8	3.9	5.2	3.7	3.7
FFO/debt (%)	14.4	21.6	15.8	21.9	23.3
Cash flow from operations/debt (%)	13.7	20.9	14.0	17.3	18.7
FOCF/debt (%)	(22.6)	(17.2)	(15.7)	(5.5)	(5.7)
DCF/debt (%)	(22.6)	(22.8)	(19.4)	(11.8)	(13.9)

Business Risk

Our assessment of Piedmont's business risk profile largely reflects its lower-risk gas distribution utility operations, size, and effective management of regulatory risk. Piedmont's regulated utility operations provide the company with scale and some diversity in regulated cash flow sources despite concentration in North Carolina. About 70% of Piedmont's rate base is in North Carolina. The company effectively manages regulatory risk and benefits from various riders that mitigate regulatory lag and under-earning. These include the integrity management riders in North Carolina and Tennessee, which allow Piedmont to recover and earn on certain capital investments outside of the rate case process. They also include rate stabilization adjustment filings in South Carolina, which allow Piedmont to annually adjust its rates if its earnings materially deviate from its authorized returns. In addition, we view Piedmont's operating assets as generally of higher quality compared to peers, reflecting no cast iron pipes within the company's gas distribution system, and a record of delivering reliable gas service to its customers. Collectively, these factors support our overall assessment of Piedmont's business risk at the higher half of its business risk profile category, relative to peers.

Financial Risk

Financial summary

We assess Piedmont's financial measures using our low-volatility table, reflecting the company's lower-risk gas distribution operations and effective management of regulatory risk. Our base-case scenario includes capital spending of about \$875 million in 2020, about \$725 million in 2021, and averaging slightly above \$815 million annually thereafter. In addition, our forecast incorporates equity contributions from the parent as needed to support Piedmont's capital structure, and no dividends to the parent through 2021. We expect Piedmont's financial measures will remain consistent with the lower end of the range for the intermediate financial risk profile category. Specifically, we expect FFO to debt to average about 14%-15%.

Table 2

Piedmont Natural Gas Co. Inc. Financial Summary					
Industry Sector: Gas					
	--Fiscal year ended Dec. 31--				
	2019	2018	2017	2016	2015
(Mil. \$)					
Revenue	1,381.0	1,375.0	1,328.0	1,210.8	1,371.7
EBITDA	489.0	396.5	465.4	418.1	450.7
Funds from operations (FFO)	409.0	314.3	385.1	345.8	362.6
Interest expense	115.0	101.2	94.2	85.4	83.0
Cash interest paid	111.0	98.2	92.2	96.8	84.9
Cash flow from operations	387.0	464.3	340.1	274.6	363.0
Capital expenditure	1,027.0	704.0	573.0	548.0	443.7
Free operating cash flow (FOCF)	(640.0)	(239.7)	(232.9)	(273.4)	(80.6)
Discretionary cash flow (DCF)	(640.0)	(239.7)	(232.9)	(387.4)	(184.0)
Cash and short-term investments	0.0	0.0	19.0	25.2	13.7

Table 2

Piedmont Natural Gas Co. Inc.--Financial Summary (cont.)

Industry Sector: Gas

	--Fiscal year ended Dec. 31--				
	2019	2018	2017	2016	2015
Gross available cash	0.0	0.0	19.0	25.2	13.7
Debt	2,833.4	2,312.0	2,364.0	2,119.6	1,866.8
Equity	2,443.0	2,091.0	1,662.0	1,672.1	1,426.3
Adjusted ratios					
EBITDA margin (%)	35.4	28.8	35.0	34.5	32.9
Return on capital (%)	6.6	5.7	7.7	7.1	9.6
EBITDA interest coverage (x)	4.3	3.9	4.9	4.9	5.4
FFO cash interest coverage (x)	4.7	4.2	5.2	4.6	5.3
Debt/EBITDA (x)	5.8	5.8	5.1	5.1	4.1
FFO/debt (%)	14.4	13.6	16.3	16.3	19.4
Cash flow from operations/debt (%)	13.7	20.1	14.4	13.0	19.4
FOCF/debt (%)	(22.6)	(10.4)	(9.9)	(12.9)	(4.3)
DCF/debt (%)	(22.6)	(10.4)	(9.9)	(18.3)	(9.9)

Reconciliation

Table 3

Piedmont Natural Gas Co. Inc.--Reconciliation Of Reported Amounts With S&P Global Ratings' Adjusted Amounts

--Fiscal year ended Dec. 31, 2019--

Piedmont Natural Gas Co. Inc. reported amounts (mil. \$)

	Debt	EBITDA	Operating income	Interest expense	S&P Global Ratings' adjusted EBITDA	Cash flow from operations	Capital expenditure
	2,860.0	478.0	304.0	87.0	489.0	409.0	1,053.0
S&P Global Ratings' adjustments							
Cash taxes paid	--	--	--	--	31.0	--	--
Cash interest paid	--	--	--	--	(84.0)	--	--
Reported lease liabilities	27.0	--	--	--	--	--	--
Operating leases	--	5.0	1.0	1.0	(1.0)	4.0	--
Capitalized interest	--	--	--	26.0	(26.0)	(26.0)	(26.0)
Share-based compensation expense	--	3.0	--	--	--	--	--
Asset-retirement obligations	13.4	1.0	1.0	1.0	--	--	--
Nonoperating income (expense)	--	--	13.0	--	--	--	--
Debt: Other	(67.0)	--	--	--	--	--	--
EBITDA: Other income/(expense)	--	2.0	2.0	--	--	--	--
Depreciation and amortization: Other	--	--	(2.0)	--	--	--	--

Table 3

Piedmont Natural Gas Co. Inc.--Reconciliation Of Reported Amounts With S&P Global Ratings' Adjusted Amounts (cont.)							
Total adjustments	(26.6)	11.0	15.0	28.0	(80.0)	(22.0)	(26.0)
S&P Global Ratings' adjusted amounts							
	Debt	EBITDA	EBIT	Interest expense	Funds from operations	Cash flow from operations	Capital expenditure
	2,833.4	489.0	319.0	115.0	409.0	387.0	1,027.0

Liquidity

As of Sept. 30, 2020, we assess Piedmont's liquidity as adequate. Piedmont can more than cover its needs for the next 12 months, even if EBITDA declines by 10%. We expect the company's liquidity sources over the next 12 months will exceed uses by more than 1.1x. Our assessment of Piedmont's liquidity also reflects the company's ability to absorb high-impact, low-probability events with limited need for refinancing, well-established relationships with banks, a solid standing in the credit markets, and manageable debt maturities over the next few years. The short-term rating on Piedmont reflects our issuer credit rating on the company.

Principal liquidity sources

- Credit facility of \$600 million; and
- Cash FFO of \$484 million.

Principal liquidity uses

- Maintenance capital spending of about \$400 million over the next 12 months; and
- Long-term debt maturities of \$160 million.

Debt maturities

- 2023: \$45 million
- 2024: \$40 million
- 2025: \$205 million

Covenant Analysis

Compliance expectations

We expect Piedmont to comply with the terms of its covenant agreements throughout our forecast period, even with a 10% decline in EBITDA.

Requirements

Piedmont is part of Duke Energy's master credit facility, which includes a covenant that requires Piedmont's total-debt-to-total-capitalization ratio to not exceed 70%.

Environmental, Social, And Governance

Piedmont's environmental exposure is in line with other regulated natural gas utility providers, including as it relates to methane emissions. This includes the potential for operational or financial risks to arise if regulation governing methane emissions become more restrictive.

Social and governance factors are neutral. Piedmont's record of service reliability could support the company's ability to maintain social cohesion. Our views of Piedmont's governance is tied to our views of its parent, Duke Energy.

Group Influence

Our rating on Piedmont incorporates our view of the company as a strategically important subsidiary of Duke Energy, meaning that we largely view Piedmont as unlikely to be sold and as important to the group's long-term strategy. Because we assess Piedmont as not sufficiently insulated from its parent, the issuer credit rating on the company is in line with Duke's group credit profile.

Issue Ratings - Subordination Risk Analysis

Capital structure

Piedmont's capital structure consists of nearly \$2.9 billion of both short-term and long-term debt.

Analytical conclusions

We rate Piedmont's senior unsecured debt the same as our issuer credit rating on the company because it is unsecured debt of a qualifying investment-grade regulated utility. The A-2 short-term rating reflects our issuer credit rating on the company.

Ratings Score Snapshot

Issuer Credit Rating

BBB+/Stable/A-2

Business risk: Excellent

- Country risk: Very low
- Industry risk: Very low
- Competitive position: Excellent

Financial risk: Intermediate

- Cash flow/leverage: Intermediate

Anchor: a+

Modifiers

- **Diversification/portfolio effect:** Neutral (no impact)
- **Capital structure:** Neutral (no impact)
- **Financial policy:** Neutral (no impact)
- **Liquidity:** Adequate (no impact)
- **Management and governance:** Satisfactory (no impact)
- **Comparable rating analysis:** Negative (-1 notch)

Stand-alone credit profile : a

- **Group credit profile:** bbb+
- **Entity status within group:** Strategically important (-2 notches from SACP)

Related Criteria

- General Criteria: Group Rating Methodology, July 1, 2019
- General Criteria: Hybrid Capital: Methodology And Assumptions, July 1, 2019
- Criteria | Corporates | General: Corporate Methodology: Ratios And Adjustments, April 1, 2019
- Criteria | Corporates | General: Reflecting Subordination Risk In Corporate Issue Ratings, March 28, 2018
- General Criteria: Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017
- Criteria | Corporates | General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014
- Criteria | Corporates | Utilities: Key Credit Factors For The Regulated Utilities Industry, Nov. 19, 2013
- General Criteria: Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- General Criteria: Methodology: Industry Risk, Nov. 19, 2013
- Criteria | Corporates | General: Corporate Methodology, Nov. 19, 2013
- Criteria | Corporates | Utilities: Collateral Coverage And Issue Notching Rules For '1+' And '1' Recovery Ratings On Senior Bonds Secured By Utility Real Property, Feb. 14, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities, Nov. 13, 2012
- General Criteria: Principles Of Credit Ratings, Feb. 16, 2011

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Business And Financial Risk Matrix

Business Risk Profile	Financial Risk Profile					
	Minimal	Modest	Intermediate	Significant	Aggressive	Highly leveraged
Excellent	aaa/aa+	aa	a+/a	a-	bbb	bbb-/bb+
Strong	aa/aa-	a+/a	a-/bbb+	bbb	bb+	bb
Satisfactory	a/a-	bbb+	bbb/bbb-	bbb-/bb+	bb	b+
Fair	bbb/bbb-	bbb-	bb+	bb	bb-	b
Weak	bb+	bb+	bb	bb-	b+	b/b-
Vulnerable	bb-	bb-	bb-/b+	b+	b	b-

Ratings Detail (As Of February 9, 2021)*

Piedmont Natural Gas Co. Inc.	
Issuer Credit Rating	BBB+/Stable/A-2
Senior Unsecured	BBB+
Issuer Credit Ratings History	
26-Jan-2021	BBB+/Stable/A-2
15-Dec-2020	A-/Negative/A-2
20-Nov-2019	A-/Stable/A-2
20-May-2019	A-/Negative/A-2
05-Feb-2019	A-/Stable/A-2
20-Jun-2017	A-/Stable/NR
12-Jan-2017	A-/Stable/A-2
14-Oct-2016	A-/Negative/A-2
Related Entities	
Cinergy Corp.	
Issuer Credit Rating	A-/Negative/A-2
Duke Energy Carolinas LLC	
Issuer Credit Rating	A-/Negative/A-2
Senior Secured	A
Senior Unsecured	A-
Duke Energy Corp.	
Issuer Credit Rating	A-/Negative/A-2
Commercial Paper	
Local Currency	A-2
Junior Subordinated	BBB
Preferred Stock	BBB
Senior Unsecured	BBB+
Duke Energy Florida, LLC	
Issuer Credit Rating	A-/Negative/A-2
Senior Secured	A
Senior Unsecured	A-
Duke Energy Indiana Inc.	
Issuer Credit Rating	A-/Negative/A-2

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Ratings Detail (As Of February 9, 2021)*(cont.)

Senior Secured	A
Senior Unsecured	A-
Duke Energy Kentucky Inc.	
Issuer Credit Rating	A-/Negative/A-2
Senior Unsecured	A-
Duke Energy Ohio Inc.	
Issuer Credit Rating	A-/Negative/A-2
Senior Secured	A
Senior Unsecured	A-
Duke Energy Progress, LLC	
Issuer Credit Rating	A-/Negative/A-2
Preferred Stock	BBB
Senior Secured	A
Senior Unsecured	A-
Florida Progress Corp.	
Issuer Credit Rating	A-/Negative/NR
Progress Energy Inc.	
Issuer Credit Rating	A-/Negative/NR
Senior Unsecured	BBB+

*Unless otherwise noted, all ratings in this report are global scale ratings. S&P Global Ratings' credit ratings on the global scale are comparable across countries. S&P Global Ratings' credit ratings on a national scale are relative to obligors or obligations within that specific country. Issue and debt ratings could include debt guaranteed by another entity, and rated debt that an entity guarantees.

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Piedmont Natural Gas
 13 Month Average Capital Structure
 as of May 31, 2021

[BEGIN CONFIDENTIAL]

	Amount (\$)	Ratio
Long-Term Debt	2,707,488,369	48.81%
Short-Term Debt	36,227,098	0.65%
Common Equity	2,803,794,382	50.54%
Total	5,547,509,849	100.00%

	Monthly Balance	Long-Term Debt	Short-Term Debt ¹	Common Equity	Total Capitalization
1	May-20				
2	Jun-20				
3	Jul-20				
4	Aug-20				
5	Sep-20				
6	Oct-20				
7	Nov-20				
8	Dec-20				
9	Jan-21				
10	Feb-21				
11	Mar-21				
12	Apr-21				
13	May-21				
13 Month Average		2,707,488,369	36,227,098	2,803,794,382	5,547,509,849

[END CONFIDENTIAL]

¹. Gas Inventory per Public Staff witness Feasel, Exhibit I, Schedule 2-2.

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PIEDMONT'S CAPITAL ACCOUNTS

	[A=B+E+J]	[B=C-D]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J=F+G+H+I]
Month	Total Capitalization	Total Long-Term Debt	Long-Term Debt	Unamortized Debt Expense	Public Staff Gas Inventory	Common Stock	Retained Earnings	Other Comprehensive Income	Balance in Paid in Capital	Total Common Equity
May-20										
Jun-20										
Jul-20										
Aug-20										
Sep-20										
Oct-20										
Nov-20										
Dec-20										
Jan-21										
Feb-21										
Mar-21										
Apr-21										
May-21										

Investment Risk Measures

Group of Natural Gas Utility Companies

Company Name	Value Line ⁴					S&P ² Beta	S&P ⁵	S&P ⁶	Moody's ⁶
	Safety Rank	Beta	Price Stability	Earnings Predict.	Financial Strength		Quality Ranking	Bond Rating	Bond Rating
1 Atmos Energy	1	0.80	95	100	A+	0.39	A	A-	A1
2 Chesapeake Utilities	2	0.80	85	95	A	0.39	A	NA	NA
3 MDU Resources	3	1.10	75	75	B++	0.79	A-	BBB+	NA
4 National Fuel Gas	3	0.85	95	5	B+	0.74	B	BBB-	Baa3
5 New Jersey Resources	2	1.00	80	55	A+	0.54	A	NA	A1
6 Northwest Natural	3	0.85	85	5	A	0.46	B+	A+	Baa1
7 ONE Gas Inc.	2	0.80	95	100	B++	0.41	NR	BBB+	A3
8 South Jersey Inds.	3	1.05	60	65	B++	0.87	B+	BBB	NA
9 Southwest Gas	3	0.95	80	100	A	0.16	A	BBB+	Baa2
10 Spire Inc.	2	0.85	90	50	B++	0.3	A-	A-	Baa2
11 UGI Corp.	2	1.00	85	85	B++	0.99	A	NA	NA
Average	2.4	0.91	84	67		0.55			

Sources:

¹Value Line Investment Survey, May 28, 2021.

² CFRA, S&P Global Market Intelligence, Stock Report, July 17, 2021.

³ S&P Global Market Intelligence, CFRA Stock Report, July 23, 2021.

DCF MODEL

Company	Yield ²	Value Line ¹ Historical						Value Line Forecast			Yahoo ³
		EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS	EPS
		10-Yr	10-Yr	10-Yr	5-Yr	5-Yr	5-Yr	5-Yr ⁴	5-Yr	5-Yr	5-Yr
1 Atmos Energy	2.6	8.0	5.0	7.5	9.0	7.5	10.0	7.0	7.5	10.5	7.2
2 Chesapeake Utilities	1.6	9.5	6.5	9.5	9.0	7.5	11.0	8.5	8.0	6.5	4.7
3 MDU Resources	2.6	0.5	3.0	---	5.5	4.5	-0.5	10.5	2.5	7.5	7.2
4 National Fuel Gas	3.4	3.5	3.0	1.0	4.0	2.5	-3.0	19.0	4.0	8.5	8.5
5 New Jersey Resources	3.2	6.0	7.0	7.5	5.5	6.5	8.5	2.0	5.5	5.5	6.0
6 Northwest Natural Gas	3.6	-1.5	1.5	1.0	1.5	0.5	---	5.5	0.5	8.5	3.8
7 One Gas	3.1	---	---	---	10.0	14.5	3.0	6.5	7.0	10.5	5.0
8 South Jersey inds.	4.9	1.5	6.5	5.5	-1.5	4.0	2.5	11.5	4.5	6.5	4.8
9 Southwest Gas Corp	3.5	7.5	8.5	6.0	5.5	8.0	7.0	9.0	4.5	6.0	4.0
10 Spire	3.6	1.5	4.5	7.0	4.5	6.0	5.5	10.0	4.5	9.0	7.3
11 UGI Corp.	3.0	5.5	8.0	7.0	7.0	7.5	5.5	6.0	4.5	7.0	7.7
Average	3.2	4.8	5.4	5.8	6.2	6.3	6.6	7.7	4.8	7.8	6.0
Average DCF Result		8.0	8.6	9.0	9.4	9.5	9.8	10.9	8.0	11.0	9.2

Sources:

¹Value Line Investment Survey, May 28, 2021

²Value Line Investment Survey, Summary and Index, Feb. 5, 2021 through June 23, 2021.

³Yahoo Finance, Projected Five Year Earnings Estimates, downloaded on June 30, 2021.

⁴ The 5-Yr. average calculation excludes the 19% growth estimate National Fuel Gas due to unsustainability.

Note:

Average calculation does not include negative values.

REGRESSION ANALYSIS OF APPROVED RETURNS ON EQUITY
 FOR LOCAL NATURAL GAS DISTRIBUTION UTILITIES

		[A]	[B]	[C]=[A]-[B]
	General Rate Case			
	Year	Gas Utility Approved ROE ¹	Moody's A-Rated Bond Yields ²	Gas Utility Risk Premium
1	2007	10.22%	6.05%	4.17%
2	2008	10.39%	6.51%	3.88%
3	2009	10.22%	6.04%	4.19%
4	2010	10.15%	5.47%	4.68%
5	2011	9.91%	5.04%	4.87%
6	2012	9.93%	4.13%	5.80%
7	2013	9.68%	4.48%	5.20%
8	2014	9.78%	4.28%	5.50%
9	2015	9.60%	4.12%	5.49%
10	2016	9.53%	3.93%	5.60%
11	2017	9.73%	4.00%	5.73%
12	2018	9.59%	4.25%	5.34%
13	2019	9.72%	3.77%	5.95%
14	2020	9.46%	3.02%	6.45%
15	2021	9.62%	3.15%	6.47%
			Average	5.29%

Sources:

¹ S&P Global Market Intelligence, Regulatory Research Associates, "Major Rate Case Decisions. January - June 2021, July 27, 2021.

² Moody's Bond Yields with annual data from January, 2007 through June, 2021.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY
 FOR LOCAL NATURAL GAS DISTRIBUTION UTILITIES

<i>Regression Statistics</i>	
Multiple R	0.925636275
R Square	0.856802513
Adjusted R Squar	0.845787322
Standard Error	0.001132705
Observations	15

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	9.97981E-05	9.98E-05	77.783716	7.56897E-07
Residual	13	1.66793E-05	1.283E-06		
Total	14	0.000116477			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.086826205	0.001339326	64.828303	1.038E-17
X Variable 1	0.253513724	0.028744657	8.8195077	7.569E-07

A-Rated Public Utility Bond Yield	
Feb-21	3.09%
Mar-21	3.44%
Apr-21	3.30%
May-21	3.33%
Jun-21	3.16%
Jul-21	2.95%
Average	3.21%

Predicted Cost of Equity **9.50%**

Note:

$Predicted\ Cost\ of\ Equity\ of\ 9.50\% = 0.08688681 + 0.25351372 \times 3.21\%.$

COMPARABLE EARNINGS ANALYSIS

	2015	2016	2017	2018	2019	2020
1 Atmos Energy	9.9%	10.1%	9.8%	9.3%	8.9%	8.6%
2 Chesapeake Utilities	11.1%	10.0%	9.0%	10.9%	10.9%	10.1%
3 MDU Resources	7.3%	9.7%	11.7%	10.5%	11.8%	12.7%
4 National Fuel Gas	NMF	NMF	16.6%	20.2%	14.5%	NMF
5 New Jersey Resources	13.9%	11.8%	12.1%	16.9%	11.3%	10.6%
6 Northwest Natural	6.9%	6.9%	NMF	8.8%	7.5%	7.9%
7 ONE Gas Inc.	6.5%	7.4%	8.2%	8.4%	8.5%	8.8%
8 South Jersey Inds.	9.5%	8.0%	8.2%	9.2%	7.2%	9.8%
9 Southwest Gas	8.7%	9.1%	9.6%	8.1%	8.5%	8.7%
10 Spire Inc.	8.7%	8.2%	8.1%	9.5%	7.9%	3.2%
11 UGI Corp.	13.1%	12.6%	12.9%	13.2%	10.8%	13.6%
Average	9.6%	9.4%	10.6%	11.4%	9.8%	9.4%

	<u>Average</u>	<u>Median</u>
Historical ROEs, 66 observations	10.0%	9.5%

Sources:

¹ Value Line Investment Survey, May 28, 2021.

Summary

	Estimated Cost of Equity
<hr/>	
<u>DCF Method</u>	
Historical Growth Rates	9.10%
Historical & Forecasted Growth Rates	9.35%
Predicted Growth Rates	9.73%
<hr/>	
Risk Premium Method - LDCs	9.50%
<hr/>	
Average	9.42%

Experts Forecast Long-Term Stock and Bond Returns: 2019 Edition

Christine Benz
Jan 10, 2019

Savvy investors might view market predictions as pure folly. After all, it's next to impossible to predict what the market will return, especially over shorter time periods, so why bother?

It's certainly a mistake to try to predict the market in an effort to determine whether, when, and how much to hold in stocks and other asset classes. Even professional investors have struggled with tactical asset allocation, casting doubt on the ability of individual investors or even financial advisors to outperform strategic asset allocation with the approach.

But the fact is, even long-term, strategically minded investors need some type of market-return forecast to craft a financial plan. Without any view on how much stocks, bonds, and cash are apt to return, it's impossible to know how much you'll need to save and for how long. You can't know whether saving for retirement should be your sole financial preoccupation or whether you can hit other goals, such as college funding, along the way. To help turn your financial goals into reality, it's crucial to make assumptions about what the major asset classes, and in turn your own portfolio, are apt to return. That way you can determine how much of the heavy lifting for your plan will come from market appreciation and how much will have to come from your own contributions.

To help you arrive at an educated guess of how much the market will contribute to the success of your plan, I've been compiling annual looks at return expectations from market experts both inside and outside of Morningstar. Note that the parameters for these return estimates vary a bit; some of the return expectations are inflation-adjusted while others are not (nominal). Some of them are quite recent, while others date to earlier in 2018. In addition, some of the experts forecast returns for the next decade, while others employ slightly shorter time horizons.

Yet there were some commonalities among many of the forecasts. First, starting yields on intermediate-term bonds, historically a good predictor of future returns from bonds, suggest that bonds will give U.S. equities a run for their money over the next decade. In addition, many of the market forecasts suggest higher returns

from non-U.S. stocks, especially emerging markets, than U.S. over the next decade.

Before you take those return forecasts to the bank, however, it's important to bear in mind that these return estimates are more intermediate term than they are long. As such, they're the most relevant to investors whose time horizons are in that ballpark, or to new retirees who face sequence-of-return risk in the next decade. Investors with very long time horizons of 20 to 30 years or longer can reasonably assume that market returns will run in line with their very long-term historic norms: 8% to 10% for stocks and half that amount for bonds.

BlackRock Investment Institute

Highlights: 7% nominal (non-inflation-adjusted) return for U.S. large caps over the next decade; 9% for non-U.S. large caps; 3.3% for the U.S. Aggregate Bond index(December 2018).

Bond index(December 2018).

BlackRock Investment Institute's Capital Markets Assumption report is heavy on the disclaimers, noting that the assumptions are "not intended as a recommendation to invest in any particular asset class or strategy or as a promise--or even estimate--of future performance." For each asset class, the firm provides a median expected return, as well as "uncertainty bands" depicting returns in a range. The firm provides assumptions for conventional asset classes as well as nontraditional ones such as hedge funds and private equity.

BlackRock Investment Institute's 7% median expected return for U.S. stocks put it at the high end of our sampling, but its expectation that foreign stocks would outperform (9% for foreign large caps) was a common theme across many of the firms. Notably, however, BlackRock Investment Institute is less sanguine about the prospects for emerging markets than it is for the broad universe of global non-U.S. equities, making it something of an outlier among many of the firms in our sample.

John C. Bogle, founder of Vanguard Group

Highlights: 4%-5% returns for stocks (nominal); 4% nominal returns for bonds over the next decade (October 2018).

In an interview in October (prior to the recent market volatility), the Vanguard founder was a bit more optimistic about returns from U.S. stocks over the next decade than he had been in previous years. As always, Bogle backs into his

return forecast by looking at the equity market's current dividend yield, then factors in expected earnings growth and P/E multiple expansion or contraction. The S&P 500 currently yields about 2%, and Bogle expected in late October that earnings growth would run in the range of 5%. He then gave that 7% expected return (the 2% dividend yield plus 5% earnings growth) a haircut to account for his expected P/E contraction, bringing his self-described "reasonable expectation" for stocks down to between 4% and 5%. To arrive at his 4% return expectations for bonds over the next decade, Bogle uses a blend of the starting yields for Treasuries and high-quality corporates.

GMO

Highlights: negative 4.1% real (inflation-adjusted) returns for U.S. large caps over the next seven years; negative 0.2% real returns for U.S. bonds; 4.4% real returns for emerging-markets equities; 2.9% real returns for emerging-markets debt (November 2018).

As always, the return expectations from the notoriously pessimistic Grantham Mayo Van Otterloo run toward the gloomy side of our collected prognostications. The firm expects U.S. large caps and hedged international bonds to post the worst performance of all of its major asset classes over the next 7 years: It's forecasting negative 4.1% real returns for the former and negative 2.1% real returns from dollar-hedged international bonds from developed markets. The firm expects U.S. small-cap stocks to perform much better than large, but still believes that U.S. small-cap investors will sink into the red on an inflation-adjusted basis, losing 0.7%.

Consistent with its recent expectations, the firm is most sanguine about the prospects for emerging-markets equities and bonds, forecasting 4.4% real returns for emerging-markets equities and 2.9% gains for emerging-markets bonds. The firm is more optimistic still for the subset of emerging-markets equities it considers emerging markets value stocks, predicting a nearly 8% real return for the asset class.

It's worth noting that the firm's pessimism on U.S. equities and positive outlook for emerging markets has cost it on the return front over the past several years: Wells Fargo Absolute Return (WARAX), which GMO manages, has recently struggled and earns a Neutral rating from Morningstar's analyst team.

J.P. Morgan Asset Management

Highlights: 5.25% return assumption (nominal) for U.S. equities over a 10- to 15-year horizon; 4.5% nominal return assumption for U.S. investment-grade corporate bonds over 10- to 15-year holding period (October 2018).

J.P. Morgan Asset Management updates its capital return assumptions for major asset classes annually, and notes that its assumptions are little changed from 2018. One of the biggest upward revisions in the firm's return assumptions was in the realm of U.S. high-quality corporate bonds, from 3.5% to 4.5%. As with several of the other firms, J.P. Morgan Asset Management is more sanguine about the prospects for emerging markets equities than developed markets stocks; the firm's assumption is for an 8.5% return from the asset class over the next 10 to 15 years, a function of lower starting valuations.

Note that J.P. Morgan Asset Management expresses its return assumptions in nominal, rather than inflation-adjusted, terms. However, the firm describes its inflation expectations as dovish, meaning that it expects inflation to continue to be mild. Additionally, it's important to note that the firm published its report before markets took a dive at the end of 2018.

Morningstar Investment Management

Highlights: 1.8% 10-year nominal returns for U.S. stocks; 3.3% 10-year nominal returns for U.S. bonds (Sept. 30, 2018).

The headline here is that as of Sept. 30, 2018, Morningstar Investment Management expected higher gains from U.S. bonds than U.S. stocks over the next decade. As with GMO, however, the outlook is more optimistic for foreign equities: MIM expects U.S. holders of international developed equities to earn nearly 6% on a nominal (noninflation-adjusted) basis, and U.S. holders of emerging-markets equities to earn nearly 7% nominally. Morningstar Investment Management provides its latest return expectations in Morningstar Markets Observer; the latest issue will be out this month.

Research Affiliates

Highlights: 0.7% real returns for U.S. large caps during the next 10 years; 0.5% real returns for the Barclays U.S. Aggregate Bond Index (Dec. 31, 2018; valuation-dependent model).

Research Affiliates deserves plaudits for its intuitive and user-friendly scatter plot depicting the firm's expectations for 10-year returns and volatility from the major

can also adjust to see return expectations based on a valuation-focused model and one focused on dividends and growth.

The firm's recent 10-year risk/return expectations suggest that U.S. investors relying strictly on U.S. stocks and bonds could be disappointed over the next decade: The firm's valuation-dependent model calls for a 0.7% real return for U.S. large-cap stocks and 0.5% inflation-adjusted gains for the U.S. Aggregate Bond Index. Real return expectations are more encouraging for those two asset classes using the firm's "yield and growth" model--3.3% for U.S. large caps and 0.6% for the U.S. Aggregate Bond Index.

Like GMO and Morningstar, the firm has higher return expectations from foreign stocks and especially emerging markets. Its valuation-dependent model suggests a nearly 6% real return over the next decade from the MSCI EAFE index (developed markets foreign stocks) and a nearly 8% return from emerging markets equities.

Vanguard

Highlights: Nominal U.S. equity-market returns in the 3% to 5% range during the next decade; 6% to 8% returns for non-U.S. equities; 2.5% to 4.5% expected returns for global fixed-income markets (December 2018).

In its 2019 Economic and Market Outlook, Vanguard's Investment Strategy Group wrote that its 10-year return assumptions for global stocks and bonds are modestly higher than this time last year. But the firm isn't forecasting blockbuster gains from any of the major asset classes. It's expecting U.S. equities to post gains in the 3% to 5% range, lower than its forecast for non-U.S. equities (6% to 8%). Thus, like other firms, it's emphasizing the importance of geographic diversification. In contrast with several of the aforementioned firms, however, Vanguard calls valuations in emerging markets "stretched." Ditto for valuations in the U.S., which Vanguard's economists expect to contract as yields rise over the next decade.

Note that Vanguard expresses its capital markets return assumptions in nominal rather than inflation-adjusted terms. However, the report's authors don't see any reason for investors to expect runaway inflation.

Source:

<https://www.morningstar.com/articles/907378/experts-forecast-longterm-stock-and-bond-returns-2>

Why Market Returns May Be Lower and Global Diversification More Important in the Future

May 3, 2021



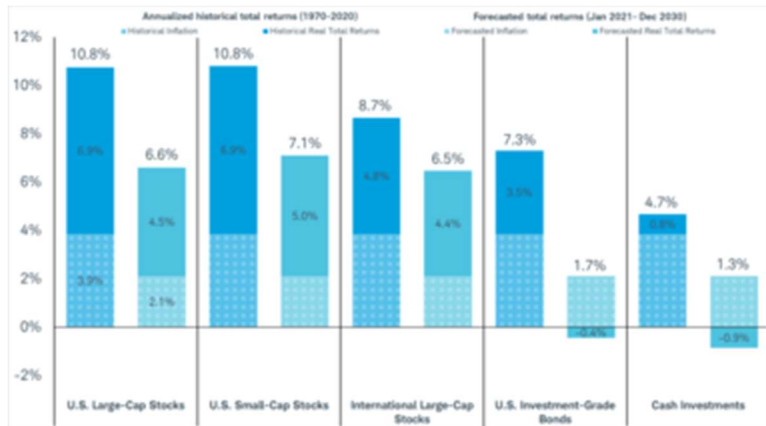
By [Veeru Perianan](#)

Market returns on stocks and bonds over the next decade are expected to fall short of historical averages, according to our 2021 estimates.¹ This article provides a broad overview of the methodology used for calculating our capital market return estimates and highlights the importance of diversification and staying focused on long-term financial objectives that are based on reasonable expectations.

The main factors behind the lower expectations for market returns are historically low interest rates, tepid long-term economic growth prospects, and elevated equity valuations.

The reduced outlook follows an extended period of double-digit returns for some asset classes, as shown in the chart below. As such, now may be a good time for investors to review, and consider resetting, long-term financial goals to ensure that they are based on projections grounded in disciplined methodology rather than on historical averages.

Curb your expectations



Total return = price growth plus dividend and interest income. The example does not reflect the effects of taxes or fees. Numbers rounded to the nearest one-tenth of a percentage point. Benchmark indexes for the asset classes: S&P 500® index (U.S. Large-Cap Stocks), Russell 2000® (U.S. Small-Cap Stocks), MSCI EAFE Index® (International Large-Cap Stocks), Bloomberg Barclays U.S. Aggregate Bond Index (U.S. Investment-Grade Bonds), and Citigroup 3-Month U.S. Treasury Bill Index (Cash Investments). Historical inflation is based on Consumer Price Index for All Urban Consumers, published by U.S. Bureau of Labor Statistics. **Past performance is no guarantee of future results.**

Source: Charles Schwab Investment Advisory, Inc. Historical data from Morningstar Direct. Data as of 12/31/2020.

Our estimates show that, over the next 10 years, stocks and bonds will likely fall short of their historical annualized returns from 1970 to December 2020. The estimated annual expected return for U.S. large-capitalization stocks from January 2021 to December 2030 is 6.6%, for example, compared with an annualized return of 10.8% during the historical period. Small-capitalization stocks, international large-capitalization stocks, core bonds, and cash investments also are projected to post lower returns through December 2030. We find the same pattern with *real* returns for these investments (i.e., returns after removing the effect of inflation). Which suggests that the reasons for this are more complex, and rest on the fundamental drivers of economic growth.

Expectations of rising inflation have been on many an investor's mind lately. The reasons are understandable, especially due to the Federal Reserve's current accommodative monetary policy as a response to the aftereffects of the pandemic on the economy. As the economy opens up and demand ramps up ahead of supply chains coming online, there could be increased inflationary pressures in the near term, but we do not believe this extends to the long term. As the economy readjusts, and we look toward the long term, we expect future inflation to remain benign at 2.1%. This is based on consensus estimates of leading economists, and is quite a bit lower than historical inflation, which has averaged 3.9% since 1970. The impact of inflation can be felt across asset classes, but most adversely in case of cash and bonds.

Cash expected returns are expected to remain low. Monetary policy, combined with investors' flight to safety, has caused bond term premiums—that is, the difference between the yields earned by locking up money over an extended period vs. rolling over a short-term instrument (like Treasury bills) for the same period—to turn negative. This suggests that bond returns are also likely to remain subdued.

Here are answers to frequently asked questions about these market estimates:

Why are long-term estimates of returns important?

A sound financial plan serves as a road map to help investors reach long-term financial goals. To get there, investors need reasonable expectations for long-term market returns.

Return expectations that are too optimistic, for example, could mislead investors to expect their investments to grow at an unrealistically high rate. This may cause them to save less, in the hope that their investments might grow large enough to fund their retirement or big expenses. But when actual returns do not match these expectations, it could lead to a delayed retirement or make it difficult to pay for a big expense, such as a college education. On the other hand, if return expectations are overly pessimistic, too much may be saved in the nest egg at the expense of everyday living.

How do you calculate your long-term forecasts?

The long-term estimates cover a 10-year time horizon. We take a forward-looking approach to forecasting returns, rather than basing our estimates on historical averages. Historical averages are less useful, as these only describe past performance. Forward-looking return estimates, however, incorporate expectations for the future, making them more useful for making investment decisions.

For U.S. and international large-cap stocks, we use analyst earnings estimates and macroeconomic forecast data to estimate two key cash-flow drivers of investment returns: recurring investment income (earnings) and capital gains generated by selling the investment at the end of the

forecast horizon of 10 years. To arrive at a return estimate, we answer the question: What returns would investors make if they bought these assets at the current price level to obtain these forecasted future cash flows?

For U.S. small-capitalization stocks, we forecast the returns by analyzing and including the so-called “size risk premium.” This is the amount of money that investors in small-capitalization stocks expect to earn over and above the returns on U.S. large-capitalization stocks.

For the U.S. investment-grade bonds asset class, which includes Treasuries, investment-grade corporate bonds and securitized bonds, our forecast takes into account yield-to-maturity of a risk-free bond, roll-down return, and a credit risk premium.² We believe the future level of return an investor will receive is anchored to a large extent by the yield of a 10-year U.S. Treasury bond. Treasury bonds are generally considered to be default-risk-free. Aside from this, roll-down return is an additional source of return bond fund investors typically earn, as they almost always invest in a bond portfolio that is designed to maintain an average maturity. For example, a roll-down return occurs when a bond fund manager sells a bond whose maturity falls below the average maturity of the portfolio. This process typically results in a gain because yields on bonds with longer maturities are usually higher than on shorter maturities, and because bond prices rise when yields fall. Credit risk premium is the return an investor earns for taking on the risk of default, as when investing in a relatively riskier bond, such as a corporate bond.

Cash investments are very short-term in nature, typically not exceeding three months at a given time, and are reinvested at the end of each period for as long of a horizon as desired. We assume this horizon to be 10 years and estimate the returns from cash investments over this period using a term premium model.

Why do you expect long-term returns to be lower than historical averages?

Three primary factors are behind the forecast for reduced returns: low interest rates, low economic growth, and equity valuations.

- **Low interest rates.** Lower inflation affects yields on everything from cash to 30-year Treasury bonds. As noted earlier, inflation is low by historical standards and expected to remain so over the next 10 years. When the rate of inflation is low, *nominal* bond yields also have been low. That is because bond investors generally do not require as much yield premium to compensate for the erosion in buying power that inflation can inflict on a portfolio. Nominal bond yields are the yields that investors typically notice and does not remove the impact of inflation, as *real* yields do. Current and expected interest rates are much lower than what has transpired historically, especially compared to the high-interest-rate environment of the 1980s. The Fed has once again started following a zero-interest-rate policy in response to the economic fallout due to COVID-19. Low yields mean investors earn less from the fixed-income portion of their portfolios.

- **Low economic growth.** Economic growth and inflation typically go hand in hand. Strong economic growth typically causes rising inflation, as demand grows faster than supply. Inflation induced by growth is a good thing, as asset returns also tend to increase. At present, while near term economic growth is likely to be robust, as the economy opens up (post-pandemic), consensus forecasts of economic growth over the long term remain subdued. A measure of economic growth is

annual *real* gross domestic product (GDP) growth. A robust economy is fundamental to achieving healthy returns from the financial markets. Everything from monetary policy, to interest rates and company earnings are linked to this. According to consensus forecasts, economists expect 2.3% GDP growth per year, on average, over the next 10 years, even after accounting for expectations of increased economic activity post-pandemic. This compares to historical average GDP growth of 3.1% per year (since 1948).

- ***Equity valuations.*** Valuations appear to be stretched compared to last March's levels. While earnings growth is expected to remain strong in the medium term—as the economy starts to get back to normal post-pandemic—the stock rally since last March has run far ahead of these expectations. High stock prices today, without a proportionate increase in future earnings, mean lower expected returns going forward. But stocks still tend to have higher expected returns than bonds, as they generally have higher risks.

What could lead to higher returns?

Returns could exceed our expectations if the U.S. economy grows more than economists anticipate. Higher-than-expected economic growth would likely lead to higher earnings growth, driving stock and bond returns higher. An example of the economy growing faster than expected occurred from 1990 to 1999. During that period, economists expected annual GDP growth of 2.4%, while the U.S. economy grew at a much higher rate of 3.4% annually on average. Corresponding returns from U.S. large-capitalization stocks were 18.2% on average and core bonds averaged 7.7% despite severe market turbulence in 1998.

What can investors do now?

Thanks to the power of compound returns, what investors do (or don't do) today can have big implications on their ability to meet their long-term goals.

Here are a few things to consider doing. First, if you don't have a long-term [financial plan](#), now is a good time to put one together. Second, try to minimize fees and taxes, particularly in a lower-return environment. And last but not least: Build a [well-diversified portfolio](#).

Piedmont Natural Gas
Overall Cost of Capital and Capital Structure
as of May 31, 2021

	Amount (\$)	Ratio	Cost Rate	Weighted Cost Rate ¹	Pre-Tax Cost of Capital ²
Long-Term Debt	2,707,488,369	48.81%	4.08%	1.991%	2.002%
Short-Term Debt	36,227,098	0.65%	0.20%	0.001%	0.001%
Common Equity	2,803,794,382	50.54%	9.42%	4.761%	6.216%
Total	5,547,509,849	100.00%		6.75%	8.22%

Pre-Tax Interest Coverage² 4.1

Note:

¹ The calculation of the weighted cost rate is rounded to the thousandth place.

² The pre-tax cost of debt and equity is grossed up by tax retention factors of 0.9944 for debt capital and 0.7659 for equity capital.